CHEIRON Classic Values, Innovative Advice

San Joaquin County Employees' Retirement Association

Actuarial Experience Study for January 1, 2019 through December 31, 2021

Produced by Cheiron

August 2022

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August 3, 2022

Board of Retirement
San Joaquin County Employees' Retirement Association
6 South El Dorado St, Suite 400
Stockton, CA 95202

Dear Members of the Board:

The purpose of this report is to provide the results of an Actuarial Experience Study of the San Joaquin County Employees' Retirement Association (SJCERA) covering actuarial experience from January 1, 2019 through December 31, 2021. This report is for the use of the SJCERA Retirement Board in selecting assumptions to be used in actuarial valuations beginning January 1, 2022.

In preparing our report, we relied on information (some oral and some written) supplied by SJCERA. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Cheiron utilizes ProVal, an actuarial valuation application leased from Winklevoss Technologies (WinTech), to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have reviewed ProVal, have a basic understanding of it, and have used it in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this report.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This report was prepared for the SJCERA Retirement Board for the purposes described herein. This report is not intended to benefit any other party, and Cheiron assumes no duty or liability to any such party.

If you have any questions about the report or would like additional information, please let us know.

Sincerely,
Cheiron

Graham A. Schmidt, ASA, FCA, MAAA, EA
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SECTION I – EXECUTIVE SUMMARY

Actuarial assumptions (economic and demographic) are intended to be long-term in nature and should be both individually reasonable and consistent in the aggregate. The purpose of this experience study is to evaluate whether or not the current assumptions adequately reflect the long-term expectations for SJCERA, and if not, to recommend adjustments. It is important to note that frequent and significant changes in the actuarial assumptions are not typically recommended, unless there are known fundamental changes in expectations of the economy, or with respect to SJCERA's membership or assets that would warrant such frequent or significant changes.

SUMMARY OF ECONOMIC ASSUMPTION ANALYSIS

The specific economic assumptions analyzed in this report are price inflation, wage inflation, COLA growth, and the discount rate. These assumptions have a significant impact on the contribution rates in the short-term and the risk of negative outcomes in the long-term.

The economic assumptions used in the last actuarial valuation below are all still reasonable.

- 7.00% long-term rate of return on Plan assets (net of investment expenses),
- 2.75% annual increase in prices measured by the Consumer Price Index (CPI),
- 4.25% average annual real rate of return on assets
- an average annual wage increase equal to 0.25% basis points greater than price inflation (3.00% in total), and
- 2.60% post-retirement COLA average growth rate.

Based on Meketa's capital market assumption and the new asset allocation adopted by the Board at their June 2022 meeting, the likelihood of achieving an average annual return of 7.0% over the next 20 years is 50%. However, the likelihood over the next 10 years is only 40%.

It is important to consider the potential cost impact of the lower short-term expected returns from Meketa, the Plan's investment consultants, as well as other investment consultants. Meketa's assumptions indicated a 6.0% expected nominal 10-year geometric return based on the new asset allocation, which reflects a 3.4% expected real return with 2.6% inflation. If these projections are realized, the Plan would experience a pattern of actuarial losses from the assets in the near term. Thus, we propose reducing the long-term rate of return to 6.75% to increase the likelihood of achieving the expected return in both the short and long-term.

SECTION I – EXECUTIVE SUMMARY

SUMMARY OF DEMOGRAPHIC ASSUMPTION ANALYSIS

This experience study specifically analyzes and makes the following recommendations for the demographic assumptions.

- **Merit salary increases** – No changes to rates for General or Safety members recommended.
- **Retirement rates** – General members: extend ultimate retirement age from 70 to 75, Safety members: Small increases for most service-groupings.
- **Termination rates** – Increases rates at various service levels for both General and Safety members. Decrease rates for both General and Safety members with less than 15 years of service taking a refund of contributions. Only change for members terminating and going to a reciprocal employer is to increase the rate for General members with 15 or more years of service.
- **Disability rates** – Lower female General member rates using an adjusted version of the most recent State Miscellaneous Female CALPERS table. No changes to the Safety or male General disability rates. Increase the percentage of disabilities assumed to be service related for General female members.
- **Mortality rates** – Use adjusted new CalPERS base tables instead of PUB-2010 base tables, projected using 80% of the MP-2020 generational improvement scale.
- **Other assumptions** – Include a final average pay load for Safety members, modify projection of pay to remove additional wage growth component, modify benefit payment timing, and add an assumption for percentage of married members electing the unmodified benefit option

The body of this report provides additional detail and support for our conclusions and recommendations.

SECTION I – EXECUTIVE SUMMARY

IMPACT OF DEMOGRAPHIC ASSUMPTION CHANGES ON CONTRIBUTIONS

Among the demographic assumptions, the recommended changes to mortality and salary timing and load assumptions have the largest impact on contributions. This table summarizes the estimated impact on total contributions (employer and employee) for the General, Safety, and combined membership of the recommended changes to demographic assumptions contained in this report.

Table I-1

Preliminary Summary of Changes in Total Contributions from Demographic Assumption Changes
($ in Millions)

	General Contributions		Safety Contributions		SJCERA Contributions	
	Dollars	Rate (% Payroll)	Dollars	Rate (% Payroll)	Dollars	Rate (% Payroll)
Change in Contributions Due to:						
Retirement Rates	$ 0.0	(0.1%)	$ 0.5	0.7%	$ 0.6	0.0%
Termination Rates	(0.1)	0.0%	(0.2)	(0.2%)	(0.3)	(0.0%)
Disability Rates	(0.2)	(0.1%)	0.0	0.0%	(0.2)	(0.1%)
Mortality Rates	(11.0)	(2.6%)	(0.9)	(1.2%)	(11.9)	(2.4%)
Unmodified Option Percentage	(1.3)	(0.3%)	(0.3)	(0.4%)	(1.6)	(0.3%)
Benefit Payment/Salary Increase Timing and Final Average Pay Load	(9.9)	(2.0%)	(3.4)	(3.5%)	(13.4)	(2.2%)
Total Impact of Demographic Assumptions	**$ (22.5)**	**(5.0%)**	**$ (4.3)**	**(4.6%)**	**$ (26.8)**	**(4.9%)**

SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION

The economic assumptions used in actuarial valuations are intended to be long-term in nature and should be both individually reasonable and consistent with each other. The specific assumptions analyzed in this report are:

- **Price inflation** – used indirectly as an underlying component of other economic assumptions.
- **Wage inflation** – across the board wage growth used to project benefits and to amortize the unfunded liability as a level percentage of expected payroll.
- **COLA growth** – rate at which inflation-linked post-retirement COLAs are expected to change.
- **Discount rate** – used both to project long-term asset growth and to discount future cash flows in calculating the liabilities and costs of the Plan.

In order to develop recommendations for each of these assumptions, we considered historical data, both nationally and for the Plan, and expectations for the future, as expressed by the Plan's and other external investment consultants and the Board.

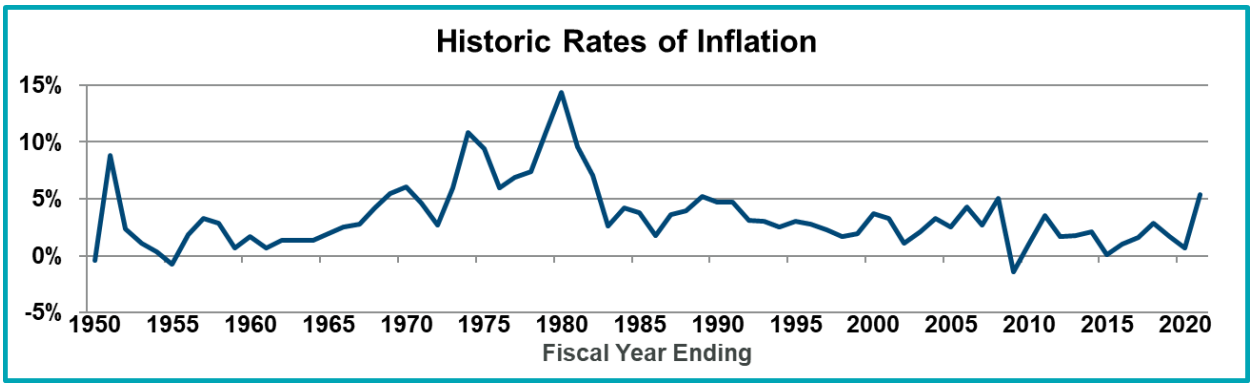
PRICE INFLATION

Long-term price inflation rates are the foundation of other economic assumptions. In a growing economy, wages and investments are expected to grow at the underlying inflation rate plus some additional real growth rate, whether it reflects productivity in terms of wages or risk premiums in terms of investments.

Historical Data

Chart II-1 below shows inflation for the U.S. by individual year since 1950.

Chart II-1



SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION

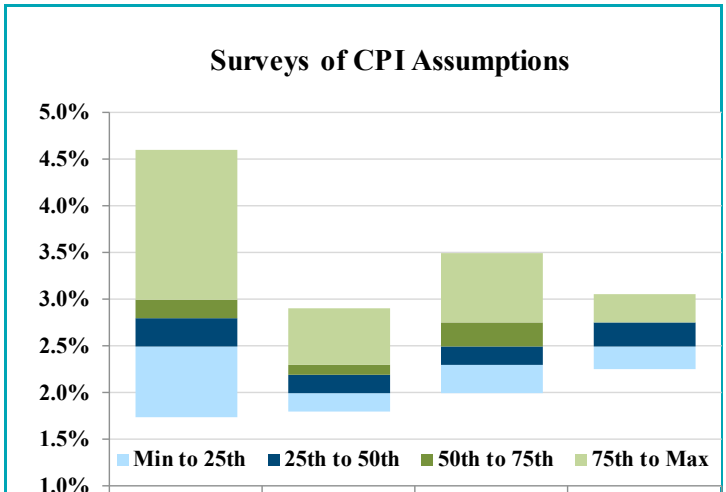
Over the 50 years ending December 2021, the geometric average inflation rate for the U.S. has been about 3.9%, but this average is heavily influenced by the high inflation rates in the 1970s and early 1980s. If you remove these periods of high inflations, the average inflation rate for the 30-year period is 2.9%, and it has been only 2.1% over the 10 years ending December 2021. However, current inflation is at record levels of 9.0%, the highest since the early 1980s.

Future Expectations

The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters. The survey for the second quarter of 2022 shows a median inflation forecast of 2.8%, with a range of future inflation expectations of almost 3.0%.

Chart II-2 below shows the distribution of the professionals' forecasts for average inflation over the next 10 years compared to assumptions from the Horizon Actuarial Services Survey of Capital Market Assumptions (2021 Edition), the 2020 Data Survey from US Public Plan (PPD) maintained by the Center for Retirement Research at Boston College and our 2021 internal survey of California public pension plans.

Chart II-2



	Economic Forecasters (10-Yr)	Horizon Survey (20-Yr)	Public Plan Database	California Survey
Minimum	1.74%	1.80%	2.00%	2.25%
25th	2.50%	2.00%	2.30%	2.50%
50th	2.80%	2.20%	2.50%	2.75%
75th	3.00%	2.30%	2.75%	2.75%
Maximum	4.60%	2.90%	3.50%	3.05%

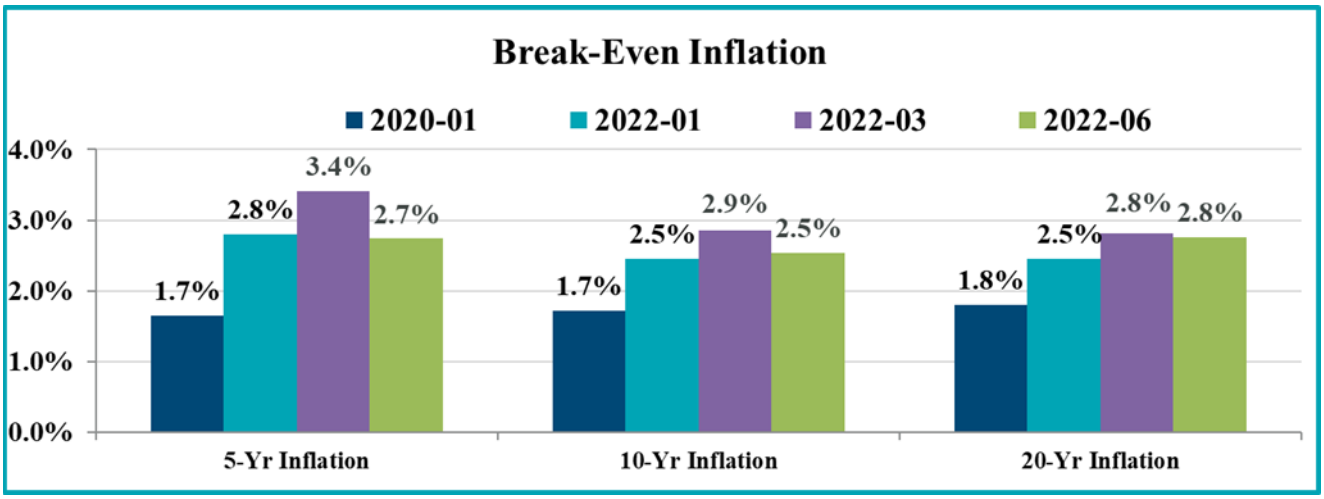
SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION

Meketa, the Board's investment consultant, uses an inflation assumption of 2.6% for the next 10 years and 2.2% over the next 20 years. The median assumption in the California survey is 2.75%, the same as SJCERA's current inflation assumption and consistent with the economic forecasters' expectation of 2.8% over the next 10 years.

Another measure of future inflation expectations is the "break-even inflation" rate which is the difference between the yields on conventional Treasury bonds and Treasury Inflation-Protected Securities (TIPS) at the same maturity. Break-even inflation is the level of inflation needed for an investment in TIPS to "break even" with an investment in conventional Treasury bonds of the same maturity. Table II-1 shows the break-even inflation rate for various historical dates.

Break-even inflation rates increased from January 1, 2020 to January 1, 2022 to 2.5% or higher for all maturities. Recent market data shows that the expectations have continued to increase during the first half of 2022 to 2.8% for the 20-year expectation.

Chart II-3



Data Source Federal Reserve, Constant Maturity Yields, Monthly Series

Based on all of these considerations, we believe a reasonable range for long-term price inflation for use in the Plan's actuarial valuations is between 2.50% and 2.75%. Therefore, we believe the Board's recent action to maintain the assumption of 2.75% is reasonable. Although actual inflation has accelerated in the latter half of 2021 and the beginning of 2022, the inflation assumption is consistent with current long-term market expectations and still slightly higher than the average expectations of many investment consultants.

SECTION II – ECONOMIC ASSUMPTIONS
WAGE INFLATION AND COLA GROWTH

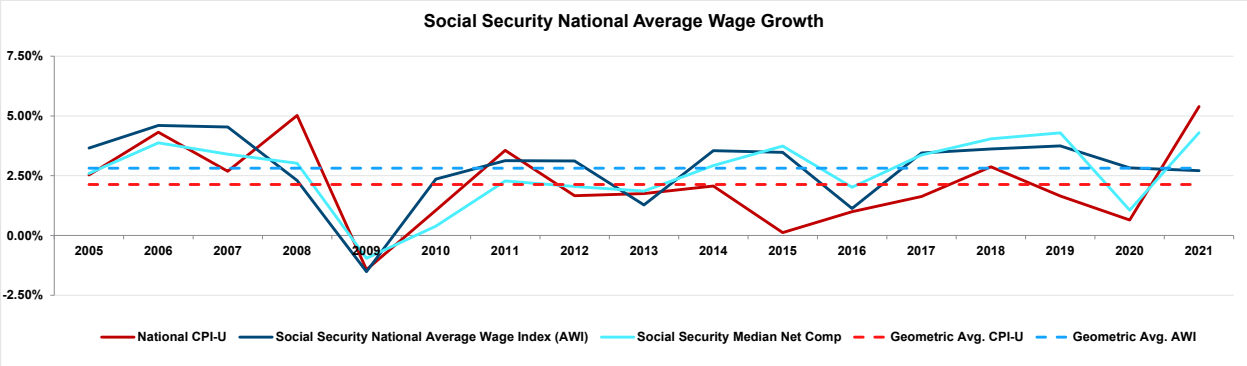
WAGE INFLATION

Wage inflation can be thought of as the annual across-the-board increase in wages. Individuals often receive salary increases in excess of the wage inflation rate, and we study these increases as a part of the merit salary scale assumption. Wage inflation generally exceeds price inflation by some margin reflecting the history of increased purchasing power.

Wage inflation is used in the actuarial valuation as the minimum expected salary increase for an individual and, for purposes of amortizing the unfunded actuarial liability, the rate at which payroll is expected to grow over the long term, assuming a stable active member population.

Chart II-4 shows the increase in national average wages (as reported by the Social Security Administration) compared to inflation from 2005 through 2021.

Chart II-4



Over this period, national wage inflation averaged approximately 2.8% compared to annual price inflation of 2.1%, making real wage increases about 0.7% above inflation. However, over the same time period the increase in the median real wage was only 0.5% per year, as much of the growth in wages was clustered at the top end of the wage scale.

It is acceptable to assume some additional level of base payroll increase beyond general inflation. Potential reasons contributing to the increase may include the presence of strong union representation in the collective bargaining process, competition in hiring among other similar employers, and regional factors – such as the local inflation index exceeding the national average, as has sometimes proven the case in parts of California. Also, the Social Security Administration projects real wage growth of 0.5% - 1.8% going forward in their Social Security solvency projections. However, governmental entities remain under financial stress, and other areas of employee compensation – most notably health care costs and pension contributions – have continued to increase faster than the CPI.

Cheiron agrees with the Board's recent action to maintain a small non-inflationary base payroll growth assumption of 0.25% annually. As a result, the annual expected increase in base payroll

will remain at 3.00%. This rate is applied to all continuing active members and to starting pay for new entrants when projections of future populations are required. This rate is also used in the calculation of the unfunded liability amortization payment as a level percentage of payroll.

COLA GROWTH

Members of SJCERA are eligible to receive automatic Cost of Living Adjustments (COLAs) based on the growth in the Bay Area Consumer Price Index (CPI-U) and a 3% cap on the annual COLA increase. Any increase in the CPI above the maximum increase can be banked for future years in which the change in the CPI is below the maximum increase.

It is necessary to determine an assumed rate of COLA growth, reflecting both inflation (i.e. the growth in the CPI), and the interaction of the CPI with the COLA cap and banking mechanism. Simulations of inflation show us that the average growth in the COLA is expected to be below the cap, even if the expected increase in the CPI is equal to or higher than the cap itself. This is because if there is not a significant bank already in existence (such as in the early years of retirement) and there are years in which inflation is below the cap, this shortfall will not be made up in future years.

We have produced statistical simulations of inflation and then modeled how the COLA maximum and the banking process interact with the changes in CPI. For a given long-term estimate of inflation, we used a 30% autocorrelation factor with 1.5% annual inflation volatility. The results of the simulation are fairly sensitive to the size of the starting bank and initial inflation which was a 0.5% bank for current retirees and 5.0% inflation, reflecting the recent level of Bay Area inflation. For actives, no bank was assumed with a starting CPI of 2.75%, the current long-term inflation assumption.

The simulations results referenced above were developed our proprietary simulation tool for assessing average annual COLA growth under difference scenarios. We have relied on Cheiron colleagues who developed the tool, and we have used the tool in accordance with its purpose.

The results of the simulations produced a single equivalent rate for retirees of 2.64% and 2.61% for active members. We recommend maintaining the 2.60% COLA growth assumption.

DISCOUNT RATE

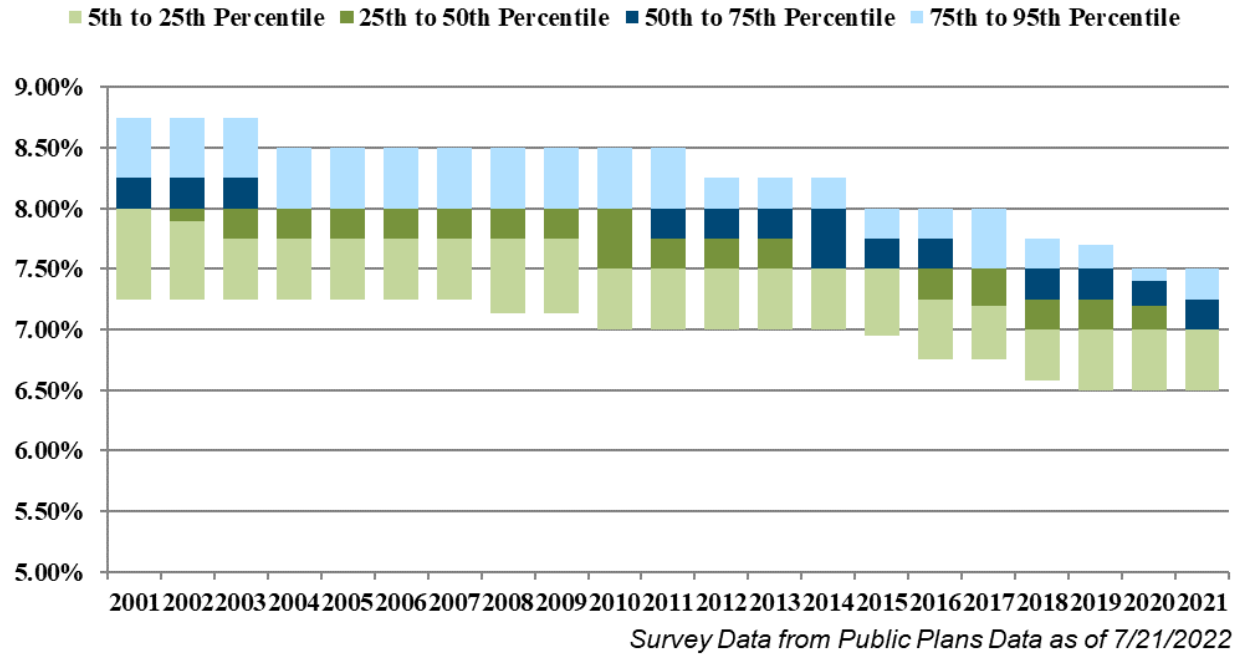
The discount rate assumption is generally the most significant of all the assumptions employed in actuarial valuations. The discount rate is based on the long-term expected return on plan investments. In the short-term, a higher discount rate results in lower expected contributions. However, over the long term, actual contributions will depend on actual investment returns and not the discount rate (or expected investment returns). If actual investment returns are lower than expected, contribution rates will increase in the future. It is important to set a realistic discount rate so that projections of future contributions for budgeting purposes will not be biased, particularly to be too low.

Other Large Public Retirement Plans

Based on the Public Fund Survey, developed by the National Association of State Retirement Administrators (NASRA) covering most of the largest public retirement systems in the country, there has been a general movement over at least the last decade to reduce the discount rate used in actuarial valuations. Chart II-5 below shows the change in the distribution of assumptions since 2001. The median assumption is now 7.00% and the number of plans using a discount rate of 7.00% or lower has increased significantly.

Chart II-5

Discount Rate

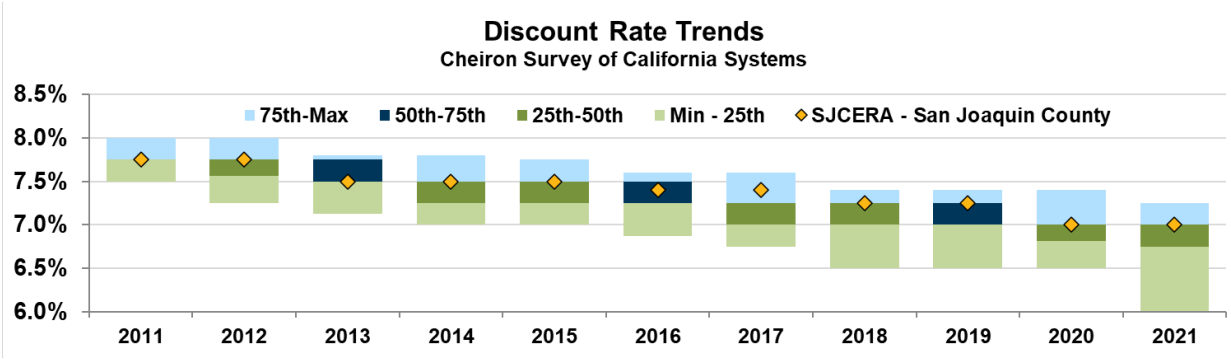


Survey Data from Public Plans Data as of 7/21/2022

SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE

In our survey of California retirement systems, the median assumption is also 7.00% with over half of the 39 systems using the median rate. Only three systems were using a rate of 7.25% or higher in 2021. Chart II-6 below shows the change in discount rate assumptions for California systems from 2011 to 2021.

Chart II-6



Target Asset Allocation and Future Expectations

The discount rate assumption depends on the anticipated average level of inflation and the anticipated average *real rate of return.* The real rate of return is the investment return in excess of underlying inflation. The expected average real rate of return is heavily dependent on asset mix: the portion of assets in stocks, bonds, and other asset classes.

Table II-1 below shows the expected nominal geometric return based on the Board's current target asset allocation and the 10-year and 20-year capital market assumptions provided by the Plan's investment consultant, Meketa, and a survey of multiple investment consultants published by Horizon Actuarial Services. The table also shows the underlying inflation assumption used by each investment consultant in the development of their capital market assumptions and computes the expected real rate of return (investment return in excess of inflation).

Table II-1

SJCERA Target Portfolio Return Expectations

Source	Nominal	Inflation	Real
Meketa (10-year)	6.01%	2.60%	3.41%
Meketa (20-year)	7.00%	2.20%	4.80%
Horizon (Survey, 10-year)	6.43%	2.13%	4.30%
Horizon (Survey, 20+ year)	7.32%	2.24%	5.08%
Average	6.69%	2.29%	4.40%

SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE

The average expected geometric real return (i.e. the return above inflation) of these assumptions is 4.40%, which is above the Board's current real return assumption of 4.25%.

Table II-2 shows the likelihood of achieving the average returns of either a 7.00% or 6.75% nominal return, as well as 4.00% or 4.25% real rates of return.

Table II-2

Likelihood of Achieving Average Returns				
	Nominal		Real	
Consultant	6.75%	7.00%	4.00%	4.25%
Meketa (10)	42.1%	39.5%	43.7%	41.0%
Meketa (20+)	52.7%	50.0%	58.6%	55.9%
Horizon (10)	42.8%	40.1%	49.5%	46.8%
Horizon (20+)	52.5%	48.7%	60.3%	56.6%
Average	47.5%	44.6%	53.0%	50.1%

Based on the new asset allocation, over the next 10 years, Meketa's expectations reflect only a 40% likelihood of the portfolio achieving an annual average 7.00% return, with about a 50% likelihood of achieving the same return over a 20-year period. The average likelihood of achieving a 7.00% return across all expectations is just under 45%. If the Board decides to reduce the assumed rate of return to 6.75%, the expected likelihood of achieving the nominal return and real rate of return increase by almost 3%.

As of the 2013 valuation, the expected rate of return is expressed net of investment, but not administrative expenses. The returns above were modeled based on the expected returns of the portfolio benchmark indices, which are expected to have minimal expenses. The actuarial standards on selecting a return assumption (ASOP 27) state that in general superior or inferior returns (net of fees) should not be assumed for active versus passive management, therefore we do not recommend a significant adjustment to the modeled returns for the fees of the asset managers. However, a slight margin is appropriate to reflect the investment-related expenses other than those of the investment managers, which would include the investment advisor and custodian.

The current real return assumption of 4.25% is higher than Meketa's short-term real return of 3.41%, but consistent with the average of both Meketa and the Horizon Survey for the short and long-term of 4.40%. After combining the real return with the inflation assumption of 2.75%, we find the current discount rate of 7.00% to be a reasonable assumption. However, there are a number of factors that suggest that the near-term expected rate of return should be discussed.

SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE

- If Meketa and much of the investment community are correct in their projections, we can expect returns below the 7.00% assumed rate for a number of years. This will result in actuarial losses and increases in employer contribution rates.
- We believe that near- and mid-term return projections should be considered along with long-term projections. Fund performance is usually measured over five to 10 years; longer measurement periods are often considered less relevant because of the potential for changes in the economy and in the investment markets.

Although 7.00% is a reasonable assumption, we recommend that the Board consider reducing the assumed rate of return to 6.75% to have a better chance of achieving the assumed return in the short and long-term. Regardless, we recommend that the Board and staff continue to conduct at least a brief discussion of this assumption annually, in consultation with the Plan's actuary and investment consultant, to determine if future changes are appropriate.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Demographic assumptions are used to predict membership behavior, including rates of retirement, termination, disability, and mortality. These assumptions are based primarily on the historical experience of SJCERA, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where SJCERA experience is not fully credible and a standard table is available. For purposes of this study, merit salary increases are also considered a demographic assumption because the assumption is based primarily on SJCERA's historical experience.

MERIT SALARY INCREASES

Salary increases consist of three components: increases due to cost of living maintenance (inflation), increases related to non-inflationary pressures on base pay (such as productivity increases), and increases in individual pay due to merit, promotion, and longevity. Increases due to cost of living and non-inflationary base pay factors were addressed in an earlier section of this report.

The merit salary increase assumption is analyzed by employee group and by service. Generally, newer employees are more likely to earn a step increase or receive a promotion, so their salary increases tend to be greater than those for longer service employees are. A longitudinal approach was used to analyze the merit increases for this study.

A *longitudinal* study reviews the average increase in pay for each level of service. To analyze the merit component, we subtracted the Plan's real wage growth from the total pay increases experienced by each member during the experience study period. We have computed the real wage growth by calculating the increase in the average salary across all active members (calculated separately for General and Safety) each year and adjusting for changes in the average service level.

Charts III-1 and III-2 on the following page analyze the pay patterns for General and Safety members, respectively. The charts show the actual experience (blue line) compared to the proposed assumption (green line, which equals the current assumptions). The tables next to each chart summarize the current and proposed salary increase assumptions at each key year of service.

We are not proposing changes to the current merit salary increase assumptions, thus the red (current) and green (proposed) assumption lines overlap. The current assumption tracks closely with experience in recent years.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Chart III-1: General

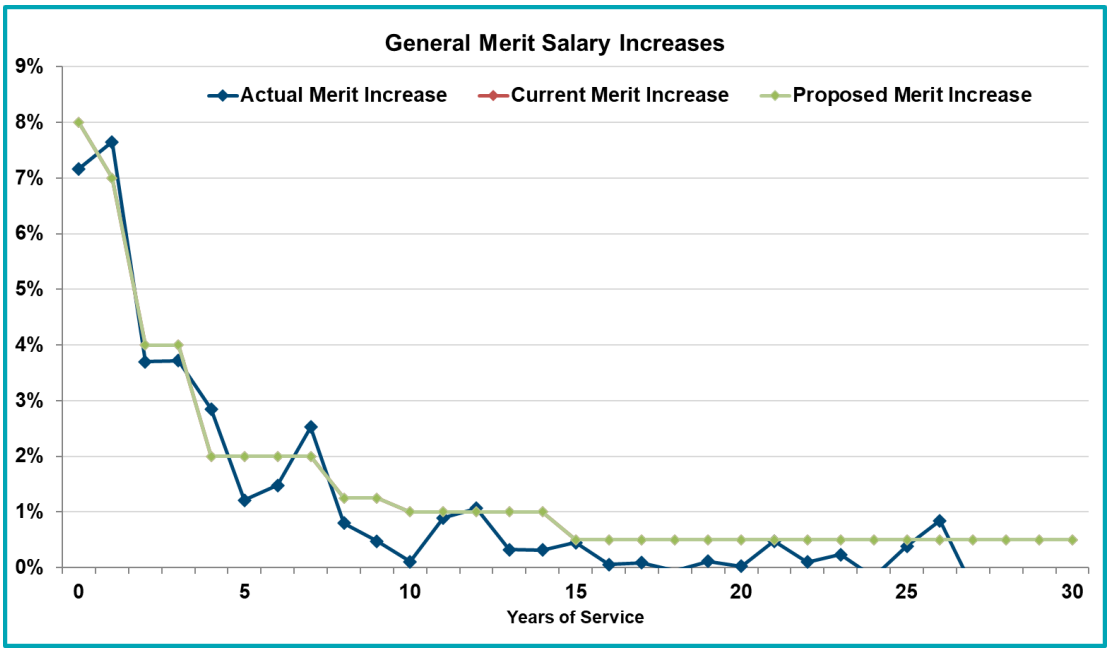
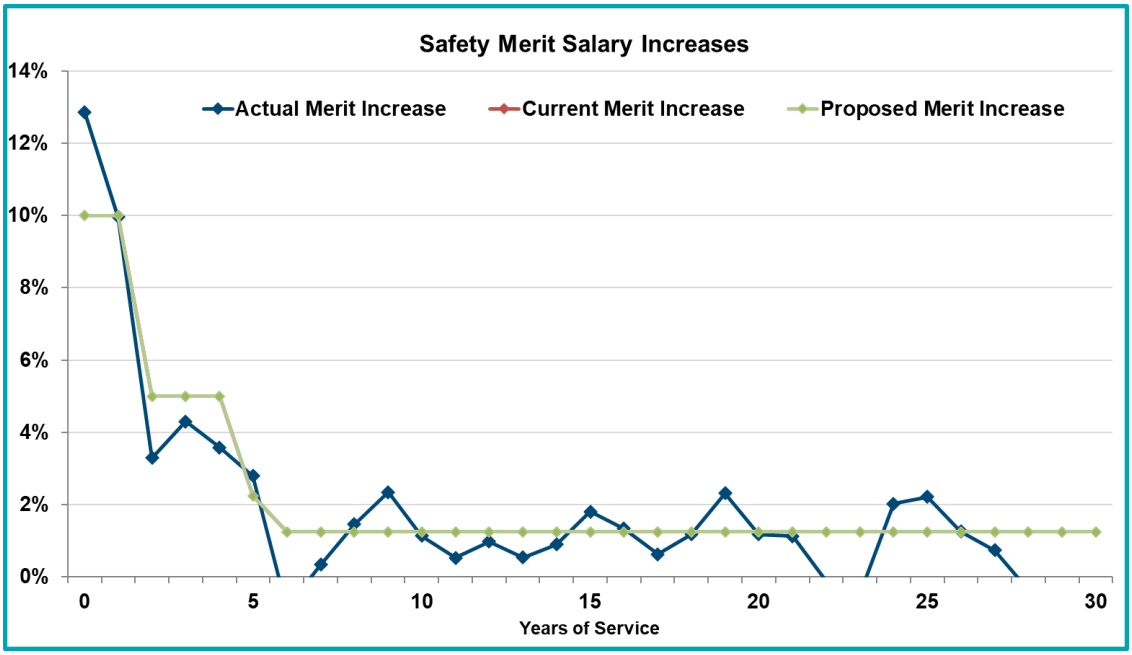


Chart III-2: Safety



SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

ANALYSIS OF OTHER DEMOGRAPHIC ASSUMPTIONS

For all of the remaining demographic assumptions, we determined the ratio of the actual number of decrements for each membership group compared to the expected number of decrements (A/E ratio or actual-to-expected ratio). If the assumption is perfect, this ratio will be 100%. Otherwise, any recommended assumption change should move from the current A/E ratio towards 100% unless future experience is expected to be different than the experience during the period of study.

We also calculate an r-squared statistic for each assumption. R-squared measures how well the assumption fits the actual data and can be thought of as the percentage of the variation in actual data explained by the assumption. Ideally, r-squared would equal 1.00 although this is never the case. Any recommended assumption change should increase the r-squared compared to the current assumption making it closer to 1.00 unless the pattern of future decrements is expected to be different from the pattern experienced during the period of study.

In addition, we calculated the 90% confidence interval, which represents the range within which the true decrement rate during the experience study period fell with 90% confidence. (If there is insufficient data to calculate a confidence interval, the confidence interval is shown as the entire range of the graph.) We generally propose assumption changes when the current assumption is outside the 90% confidence interval of the observed experience. However, adjustments are made to account for differences between future expectations and historical experience and to account for the past experience represented by the current assumption. For mortality rates, we compare SJCERA's experience to that of a standard table and adjust the tables to bring the proposed assumption closer to an A/E ratio of 100%.

Finally, since the amount of data that is available over a three-year period to analyze the decrements is somewhat limited, we have added data from the prior study (calendar years 2016 through 2021) where noted to add more credibility to these calculations. However, we also reviewed the proposed assumptions against the 2013-2018 data (from the previous experience study) in order to exclude any impacts COVID may have had on participant behavior during 2020 and 2021. We found that all the proposed assumptions were still reasonable for the previous period.

RETIREMENT RATES

The current retirement rates vary by age and service and are applied to all members who are eligible to retire. Generally, at any given age, members with more service are generally more likely to retire than members with fewer years of service. SJCERA is not large enough to justify assumptions for each age and service combination. We continue to recommend separate assumptions by age and gender for each of the following three service groups for General members:

- Members with 5-9 years of service
- Member with 10-29 years of service
- Members with 30 or more years of service

SECTION III – DEMOGRAPHIC ASSUMPTIONS

RETIREMENT RATES

We continue to recommend separate assumptions by age for each of the following two service groups for Safety members:

- Members with less than 20 years of service
- Members with 20 or more years of service

Retirement data for all members between January 1, 2019 and December 31, 2021 was somewhat limited, so we have added data from the prior study, January 1, 2016 through December 31, 2018, to add more credibility to these calculations.

We continue to recommend using the same assumptions for Tier I and II members, with the exception that the rates will only be applied once the member is eligible for retirement. For example, the retirement rates for the Tier II General members will not be applied until the member has reached age 52.

Although some have speculated that the reduced multipliers reflected in the Tier II benefits may result in members working longer than they would have under the Tier I benefit formula, thus far Tier II General members have exhibited similar patterns and rates of retirement as Tier I members. The General male and female A/E ratios based on the current assumptions are 92% and 111%, respectively. There was very limited data for the General Tier II members, only for those members with less than 10 years of service. And for Safety members, the data was not sufficient to review. Finally, our modeling of the Tier II benefits revealed that the actuarially determined contribution rates required to fund these benefits are relatively insensitive to the actual retirement rates, as a result of the early retirement reductions reflected in the benefit formulas.

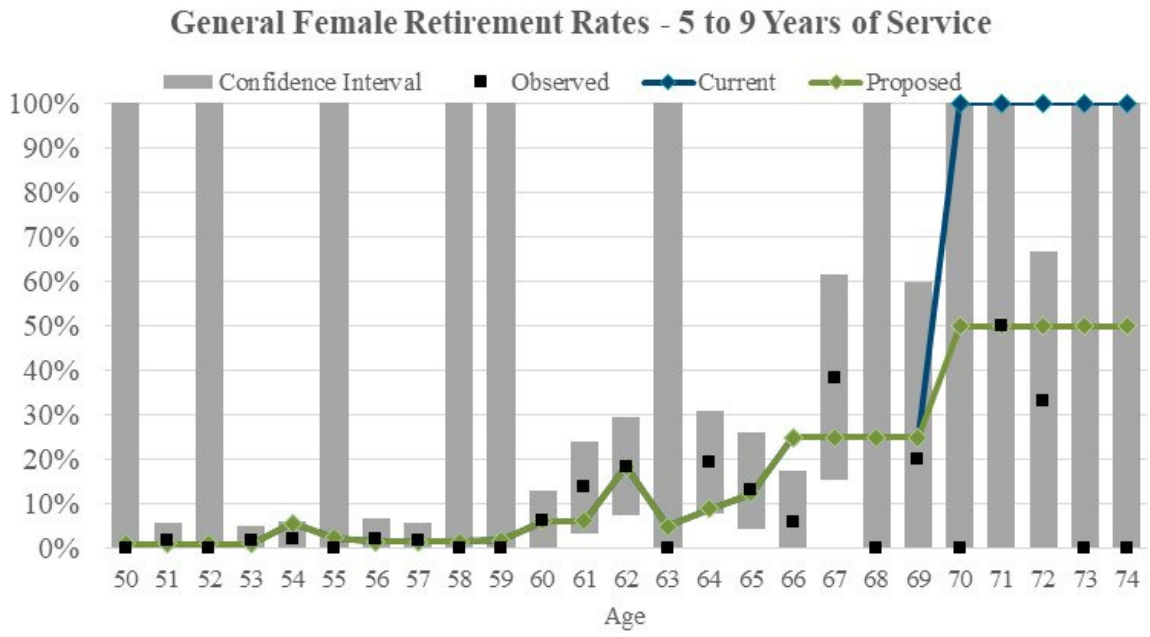
See Appendices A and B for a full listing of the proposed and prior rates for all groups.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R1 on the following page below shows the calculation of actual-to-expected ratios and the r-squared statistic for General female members with between five and nine years of service. Chart III-R1 below shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption for ages 70 to 75, therefore we propose an increase in the ultimate retirement age from age 70 to age 75. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 72% to 83%. The r-squared also increases from 25% to 43%.

Chart III-R1 -General



SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R1 – General

General Female Retirement Rates - 5 to 9 Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	67	0	1	1	0.0%	1.0%	1.0%	0%	0%
51	53	1	1	1	1.9%	1.0%	1.0%	189%	189%
52	56	0	1	1	0.0%	1.0%	1.0%	0%	0%
53	59	1	1	1	1.7%	1.0%	1.0%	169%	169%
54	49	1	3	3	2.0%	5.8%	5.8%	35%	35%
55	50	0	1	1	0.0%	2.5%	2.5%	0%	0%
56	45	1	1	1	2.2%	1.5%	1.5%	148%	148%
57	53	1	1	1	1.9%	1.5%	1.5%	126%	126%
58	47	0	1	1	0.0%	1.5%	1.5%	0%	0%
59	39	0	1	1	0.0%	2.0%	2.0%	0%	0%
60	31	2	2	2	6.5%	6.3%	6.3%	103%	103%
61	29	4	2	2	13.8%	6.3%	6.3%	221%	221%
62	27	5	5	5	18.5%	18.5%	18.5%	100%	100%
63	24	0	1	1	0.0%	5.0%	5.0%	0%	0%
64	26	5	2	2	19.2%	9.0%	9.0%	214%	214%
65	23	3	3	3	13.0%	12.5%	12.5%	104%	104%
66	17	1	4	4	5.9%	25.0%	25.0%	24%	24%
67	13	5	3	3	38.5%	25.0%	25.0%	154%	154%
68	4	0	1	1	0.0%	25.0%	25.0%	0%	0%
69	5	1	1	1	20.0%	25.0%	25.0%	80%	80%
70	5	0	5	3	0.0%	100.0%	50.0%	0%	0%
71	4	2	4	2	50.0%	100.0%	50.0%	50%	100%
72	3	1	3	2	33.3%	100.0%	50.0%	33%	67%
73	1	0	1	1	0.0%	100.0%	50.0%	0%	0%
74	0	0	0	0	0.0%	100.0%	50.0%	0%	0%
TOTAL	**730**	**34**	**47**	**41**	**4.7%**	**6.5%**	**5.6%**	**72%**	**83%**
Confidence Interval %			**92%**	**96%**					
R-squared			**25%**	**43%**					

Table III-R2 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for General female members with service between 10 and 29 years, and Chart III-R2 shows the information graphically along with the 90% confidence interval.

The data shows actual retirement rates significantly lower than expected under the current assumption for ages 70 to 75, therefore we propose an increase in the ultimate retirement age from age 70 to age 75. However, actual retirement rates are higher for ages 65 to 69, so we recommend slight increases to rates at these ages. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 94% to 99%. The r-squared also increases from 63% to 83%.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Chart III-R2 – General

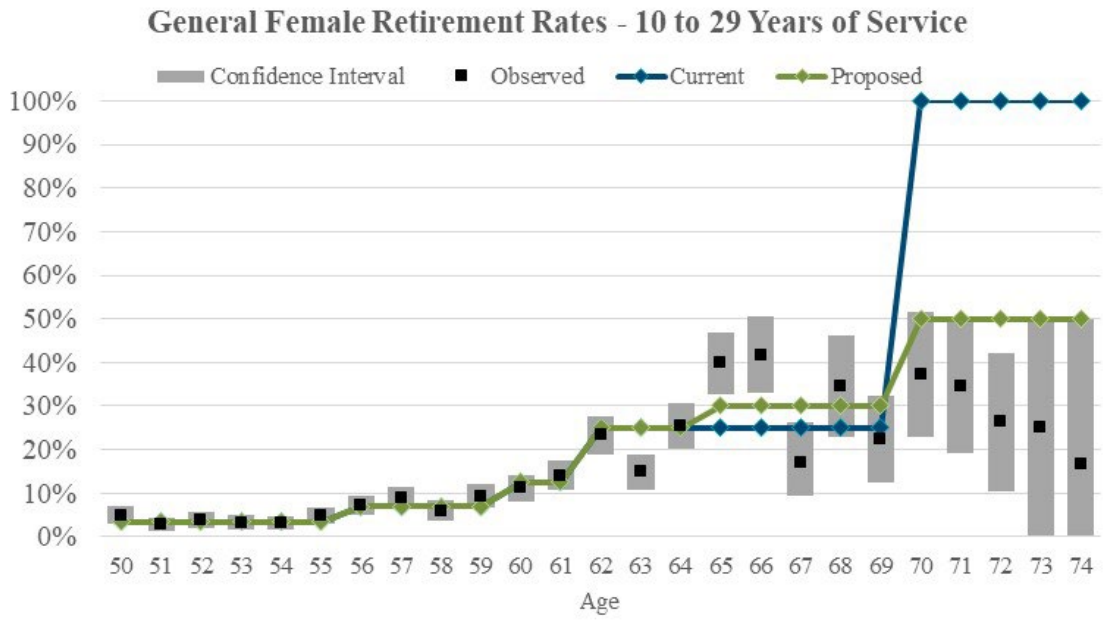


Table III-R2 – General

General Female Retirement Rates - 10 to 29 Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	362	18	13	13	5.0%	3.5%	3.5%	142%	142%
51	341	10	12	12	2.9%	3.5%	3.5%	84%	84%
52	334	13	12	12	3.9%	3.5%	3.5%	111%	111%
53	338	11	12	12	3.3%	3.5%	3.5%	93%	93%
54	359	11	13	13	3.1%	3.5%	3.5%	88%	88%
55	378	18	13	13	4.8%	3.5%	3.5%	136%	136%
56	361	26	25	25	7.2%	7.0%	7.0%	103%	103%
57	336	30	24	24	8.9%	7.0%	7.0%	128%	128%
58	315	19	22	22	6.0%	7.0%	7.0%	86%	86%
59	319	30	22	22	9.4%	7.0%	7.0%	134%	134%
60	304	34	38	38	11.2%	12.5%	12.5%	89%	89%
61	277	39	35	35	14.1%	12.5%	12.5%	113%	113%
62	253	59	63	63	23.3%	25.0%	25.0%	93%	93%
63	201	30	50	50	14.9%	25.0%	25.0%	60%	60%
64	169	43	42	42	25.4%	25.0%	25.0%	102%	102%
65	128	51	32	38	39.8%	25.0%	30.0%	159%	133%
66	79	33	20	24	41.8%	25.0%	30.0%	167%	139%
67	53	9	13	16	17.0%	25.0%	30.0%	68%	57%
68	52	18	13	16	34.6%	25.0%	30.0%	138%	115%
69	40	9	10	12	22.5%	25.0%	30.0%	90%	75%
70	35	13	35	18	37.1%	100.0%	50.0%	37%	74%
71	26	9	26	13	34.6%	100.0%	50.0%	35%	69%
72	19	5	19	10	26.3%	100.0%	50.0%	26%	53%
73	8	2	8	4	25.0%	100.0%	50.0%	25%	50%
74	6	1	6	3	16.7%	100.0%	50.0%	17%	33%
TOTAL	**5,093**	**541**	**577**	**548**	**10.6%**	**11.3%**	**10.8%**	**94%**	**99%**
Confidence Interval %			**68%**	**80%**					
R-squared			**63%**	**83%**					

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R3 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for General female members with 30 or more years of service. Chart III-R3 shows the information graphically along with the 90% confidence interval.

The data shows slightly lower actual retirement rates than expected under the current assumption for ages 70 to 75, therefore we propose an increase in the ultimate retirement age from age 70 to age 75. The proposed assumption slightly increases the aggregate assumed rate of retirement and maintains the aggregate A/E ratio at 109%. The r-squared increases from 89% to 92%.

Chart III-R3 – General

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R3 – General

General Female Retirement Rates - 30 or More Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	7	1	0	0	14.3%	4.5%	4.5%	317%	317%
51	13	0	1	1	0.0%	4.5%	4.5%	0%	0%
52	26	2	1	1	7.7%	4.5%	4.5%	171%	171%
53	40	1	2	2	2.5%	4.5%	4.5%	56%	56%
54	53	3	2	2	5.7%	4.5%	4.5%	126%	126%
55	58	5	3	3	8.6%	4.5%	4.5%	192%	192%
56	62	8	9	9	12.9%	15.0%	15.0%	86%	86%
57	65	12	10	10	18.5%	15.0%	15.0%	123%	123%
58	56	7	8	8	12.5%	15.0%	15.0%	83%	83%
59	44	8	7	7	18.2%	15.0%	15.0%	121%	121%
60	40	11	10	10	27.5%	25.0%	25.0%	110%	110%
61	37	15	9	11	40.5%	25.0%	30.0%	162%	135%
62	30	12	11	11	40.0%	35.0%	35.0%	114%	114%
63	27	8	9	9	29.6%	35.0%	35.0%	85%	85%
64	19	7	7	7	36.8%	35.0%	35.0%	105%	105%
65	12	4	4	4	33.3%	35.0%	35.0%	95%	95%
66	14	4	4	4	28.6%	30.0%	30.0%	95%	95%
67	15	5	5	5	33.3%	30.0%	30.0%	111%	111%
68	9	3	3	3	33.3%	30.0%	30.0%	111%	111%
69	6	1	2	2	16.7%	30.0%	30.0%	56%	56%
70	1	1	1	1	100.0%	100.0%	50.0%	100%	200%
71	0	0	0	0	0.0%	100.0%	50.0%	0%	0%
72	0	0	0	0	0.0%	100.0%	50.0%	0%	0%
73	1	0	1	1	0.0%	100.0%	50.0%	0%	0%
74	1	1	1	1	100.0%	100.0%	50.0%	100%	200%
TOTAL	**636**	**119**	**109**	**110**	**18.7%**	**17.2%**	**17.2%**	**109%**	**109%**
Confidence Interval %			**96%**	**100%**					
R-squared			**89%**	**92%**					

Table III-R4 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for General male members with between five and nine years of service. Chart III-R4 shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption for ages 70 to 75, therefore we propose an increase in the ultimate retirement age from age 70 to age 75. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 32% to 53%. The r-squared increases from 14% to 23%.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Chart III-R4 – General

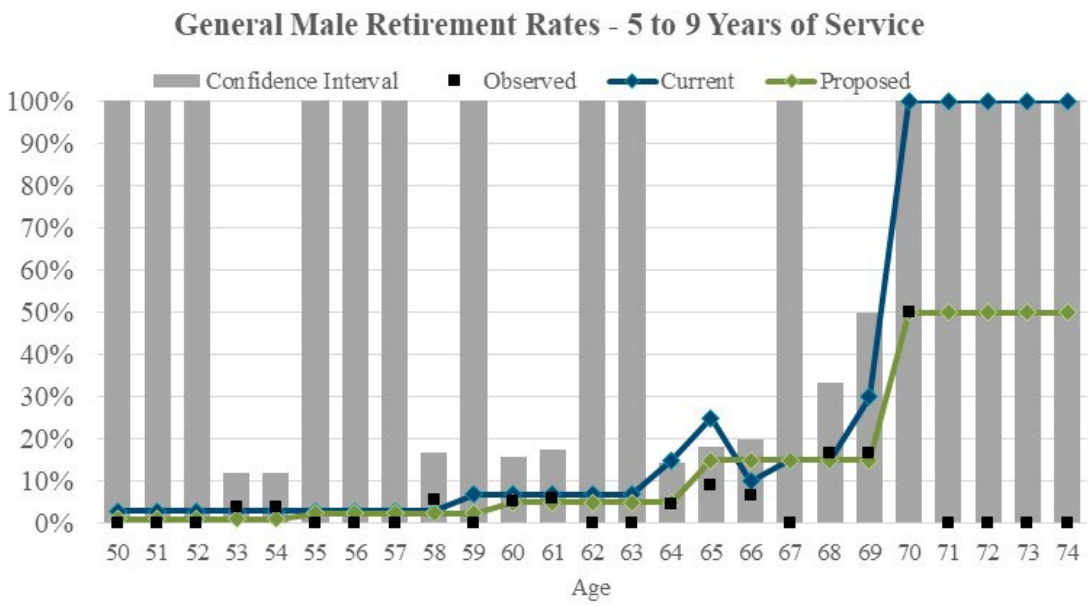


Table III-R4 – General

General Male Retirement Rates - 5 to 9 Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	30	0	1	0	0.0%	3.0%	1.0%	0%	0%
51	29	0	1	0	0.0%	3.0%	1.0%	0%	0%
52	25	0	1	0	0.0%	3.0%	1.0%	0%	0%
53	25	1	1	0	4.0%	3.0%	1.0%	133%	400%
54	25	1	1	0	4.0%	3.0%	1.0%	133%	400%
55	22	0	1	1	0.0%	3.0%	2.5%	0%	0%
56	18	0	1	0	0.0%	3.0%	2.5%	0%	0%
57	12	0	0	0	0.0%	3.0%	2.5%	0%	0%
58	18	1	1	0	5.6%	3.0%	2.5%	185%	222%
59	17	0	1	0	0.0%	7.0%	2.5%	0%	0%
60	19	1	1	1	5.3%	7.0%	5.0%	75%	105%
61	17	1	1	1	5.9%	7.0%	5.0%	84%	118%
62	23	0	2	1	0.0%	7.0%	5.0%	0%	0%
63	21	0	1	1	0.0%	7.0%	5.0%	0%	0%
64	21	1	3	1	4.8%	15.0%	5.0%	32%	95%
65	22	2	6	3	9.1%	25.0%	15.0%	36%	61%
66	15	1	2	2	6.7%	10.0%	15.0%	67%	44%
67	11	0	2	2	0.0%	15.0%	15.0%	0%	0%
68	12	2	2	2	16.7%	15.0%	15.0%	111%	111%
69	6	1	2	1	16.7%	30.0%	15.0%	56%	111%
70	2	1	2	1	50.0%	100.0%	50.0%	50%	100%
71	2	0	2	1	0.0%	100.0%	50.0%	0%	0%
72	3	0	3	2	0.0%	100.0%	50.0%	0%	0%
73	3	0	3	2	0.0%	100.0%	50.0%	0%	0%
74	2	0	2	1	0.0%	100.0%	50.0%	0%	0%
TOTAL	**400**	**13**	**40**	**24**	**3.3%**	**10.1%**	**6.1%**	**32%**	**53%**
Confidence Interval %			**92%**	**100%**					
R-squared			**14%**	**23%**					

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R5 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for General male members with service between 10 and 29 years, and Chart III-R5 below shows the information graphically along with the 90% confidence interval.

The data shows significantly lower actual retirement rates than expected under the current assumption for ages 70 to 75, therefore we propose an increase in the ultimate retirement age from age 70 to age 75. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 90% to 95%. The r-squared increases from 79% to 85%.

Chart III-R5

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R5 – General

General Male Retirement Rates - 10 to 29 Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	146	5	4	4	3.4%	3.0%	3.0%	114%	114%
51	144	1	4	4	0.7%	3.0%	3.0%	23%	23%
52	146	7	4	4	4.8%	3.0%	3.0%	160%	160%
53	145	7	4	4	4.8%	3.0%	3.0%	161%	161%
54	144	4	4	4	2.8%	3.0%	3.0%	93%	93%
55	155	7	10	10	4.5%	6.5%	6.5%	69%	69%
56	150	2	6	6	1.3%	4.0%	4.0%	33%	33%
57	153	7	6	6	4.6%	4.0%	4.0%	114%	114%
58	151	10	6	6	6.6%	4.0%	4.0%	166%	166%
59	152	8	14	14	5.3%	9.0%	9.0%	58%	58%
60	138	14	12	12	10.1%	9.0%	9.0%	113%	113%
61	110	13	17	17	11.8%	15.0%	15.0%	79%	79%
62	106	25	32	32	23.6%	30.0%	30.0%	79%	79%
63	82	17	21	21	20.7%	25.0%	25.0%	83%	83%
64	59	16	15	15	27.1%	25.0%	25.0%	108%	108%
65	44	13	11	11	29.5%	25.0%	25.0%	118%	118%
66	38	14	13	13	36.8%	35.0%	35.0%	105%	105%
67	32	11	10	10	34.4%	30.0%	30.0%	115%	115%
68	21	7	6	6	33.3%	30.0%	30.0%	111%	111%
69	23	11	9	9	47.8%	40.0%	40.0%	120%	120%
70	14	7	14	7	50.0%	100.0%	50.0%	50%	100%
71	6	2	6	3	33.3%	100.0%	50.0%	33%	67%
72	3	2	3	2	66.7%	100.0%	50.0%	67%	133%
73	1	0	1	1	0.0%	100.0%	50.0%	0%	0%
74	3	2	3	2	66.7%	100.0%	50.0%	67%	133%
TOTAL	**2,166**	**212**	**236**	**223**	**9.8%**	**10.9%**	**10.3%**	**90%**	**95%**
Confidence Interval %			**80%**	**88%**					
R-squared			**79%**	**85%**					

Table III-R6 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for General male members with 30 or more years of service. Chart III-R6 shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption for ages 70 to 75, therefore we propose an increase in the ultimate retirement age from age 70 to age 75. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 83% to 85%. The r-squared remains at 89%.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Chart III-R6 – General

Table III-R6 – General

General Male Retirement Rates - 30 or More Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	3	1	0	0	33.3%	5.0%	5.0%	667%	667%
51	1	0	0	0	0.0%	5.0%	5.0%	0%	0%
52	8	0	0	0	0.0%	5.0%	5.0%	0%	0%
53	10	0	1	1	0.0%	5.0%	5.0%	0%	0%
54	13	0	1	1	0.0%	10.0%	10.0%	0%	0%
55	20	0	2	2	0.0%	10.0%	10.0%	0%	0%
56	21	2	2	2	9.5%	10.0%	10.0%	95%	95%
57	29	4	3	3	13.8%	10.0%	10.0%	138%	138%
58	33	2	3	3	6.1%	10.0%	10.0%	61%	61%
59	32	7	9	9	21.9%	27.5%	27.5%	80%	80%
60	30	6	8	8	20.0%	27.5%	27.5%	73%	73%
61	29	7	8	8	24.1%	27.5%	27.5%	88%	88%
62	24	12	10	10	50.0%	40.0%	40.0%	125%	125%
63	11	4	4	4	36.4%	40.0%	40.0%	91%	91%
64	5	1	2	2	20.0%	40.0%	40.0%	50%	50%
65	3	1	1	1	33.3%	40.0%	40.0%	83%	83%
66	1	1	1	1	100.0%	50.0%	50.0%	200%	200%
67	0	0	0	0	0.0%	40.0%	40.0%	0%	0%
68	2	0	1	1	0.0%	30.0%	30.0%	0%	0%
69	0	0	0	0	0.0%	30.0%	30.0%	0%	0%
70	1	0	1	1	0.0%	100.0%	50.0%	0%	0%
71	1	0	1	1	0.0%	100.0%	50.0%	0%	0%
72	1	1	1	1	100.0%	100.0%	50.0%	100%	200%
73	0	0	0	0	0.0%	100.0%	50.0%	0%	0%
74	0	0	0	0	0.0%	100.0%	50.0%	0%	0%
TOTAL	**278**	**49**	**59**	**58**	**17.6%**	**21.2%**	**20.7%**	**83%**	**85%**
Confidence Interval %			**100%**	**100%**					
R-squared			**89%**	**89%**					

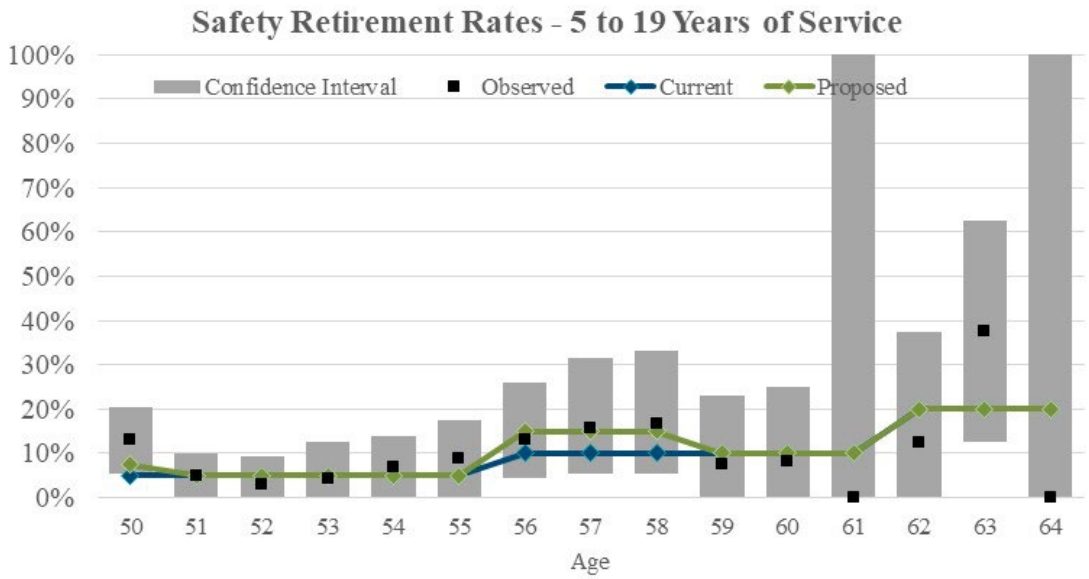
SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

We note that the current Safety retirement assumptions are split between those with less than 20 years of service and those with 20 or more years of service, with those having greater service levels assumed to experience higher retirement rates at the same age. The same pattern continues to hold in the recent retirement data; therefore, we have not recommended any changes to this approach.

Table III-R7 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with service between five and 19 years, and Chart III-R7 below shows the information graphically along with the 90% confidence interval.

The data shows slightly higher actual retirement rates at ages 50 and 56 to 58 than expected under the current assumption. The ultimate retirement age remains at 65. The proposed assumption increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio from 128% to 108%, and the r-squared increases from 74% to 76%.

Chart III-R7 – Safety



SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

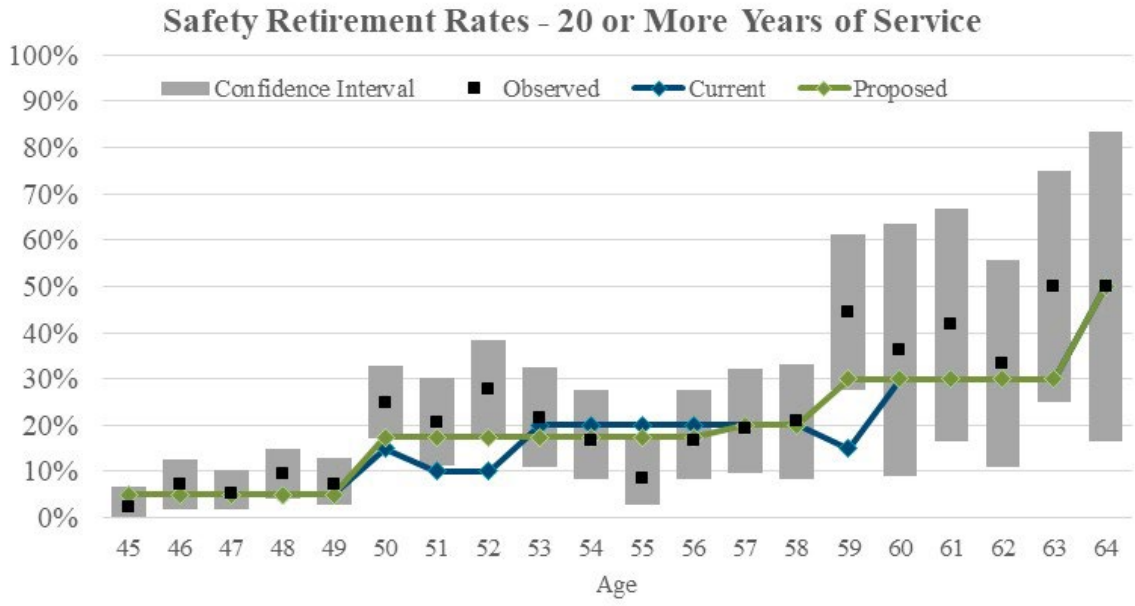
Table III-R7 – Safety

Safety Retirement Rates - 5 to 19 Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50	54	7	3	4	13.0%	5.0%	7.5%	259%	173%
51	40	2	2	2	5.0%	5.0%	5.0%	100%	100%
52	32	1	2	2	3.1%	5.0%	5.0%	63%	63%
53	24	1	1	1	4.2%	5.0%	5.0%	83%	83%
54	29	2	1	1	6.9%	5.0%	5.0%	138%	138%
55	23	2	1	1	8.7%	5.0%	5.0%	174%	174%
56	23	3	2	3	13.0%	10.0%	15.0%	130%	87%
57	19	3	2	3	15.8%	10.0%	15.0%	158%	105%
58	18	3	2	3	16.7%	10.0%	15.0%	167%	111%
59	13	1	1	1	7.7%	10.0%	10.0%	77%	77%
60	12	1	1	1	8.3%	10.0%	10.0%	83%	83%
61	7	0	1	1	0.0%	10.0%	10.0%	0%	0%
62	8	1	2	2	12.5%	20.0%	20.0%	63%	63%
63	8	3	2	2	37.5%	20.0%	20.0%	188%	188%
64	5	0	1	1	0.0%	20.0%	20.0%	0%	0%
TOTAL	**315**	**30**	**24**	**28**	**9.5%**	**7.5%**	**8.8%**	**128%**	**108%**
Confidence Interval %			**93%**	**100%**					
R-squared			**74%**	**76%**					

Table III-R8 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with service more than 20 years, and Chart III-R8 below shows the information graphically along with the 90% confidence interval.

The data shows slightly higher actual retirement rates than expected under the current assumption. The ultimate retirement age remains at 65. The proposed assumption increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio from 132% to 121%. The r-squared increases from 45% to 83%.

Chart III-R8 - Safety



SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES

Table III-R8 – Safety

Safety Retirement Rates - 20 or More Years of Service									
		Retirements			Retirement Rates			A/E Ratios	
Age	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
45	44	1	2	2	2.3%	5.0%	5.0%	45%	45%
46	56	4	3	3	7.1%	5.0%	5.0%	143%	143%
47	58	3	3	3	5.2%	5.0%	5.0%	103%	103%
48	74	7	4	4	9.5%	5.0%	5.0%	189%	189%
49	70	5	4	4	7.1%	5.0%	5.0%	143%	143%
50	76	19	11	13	25.0%	15.0%	17.5%	167%	143%
51	53	11	5	9	20.8%	10.0%	17.5%	208%	119%
52	47	13	5	8	27.7%	10.0%	17.5%	277%	158%
53	37	8	7	6	21.6%	20.0%	17.5%	108%	124%
54	36	6	7	6	16.7%	20.0%	17.5%	83%	95%
55	35	3	7	6	8.6%	20.0%	17.5%	43%	49%
56	36	6	7	6	16.7%	20.0%	17.5%	83%	95%
57	31	6	6	6	19.4%	20.0%	20.0%	97%	97%
58	24	5	5	5	20.8%	20.0%	20.0%	104%	104%
59	18	8	3	5	44.4%	15.0%	30.0%	296%	148%
60	11	4	3	3	36.4%	30.0%	30.0%	121%	121%
61	12	5	4	4	41.7%	30.0%	30.0%	139%	139%
62	9	3	3	3	33.3%	30.0%	30.0%	111%	111%
63	8	4	2	2	50.0%	30.0%	30.0%	167%	167%
64	6	3	3	3	50.0%	50.0%	50.0%	100%	100%
TOTAL	**741**	**124**	**94**	**103**	**16.7%**	**12.7%**	**13.8%**	**132%**	**121%**
Confidence Interval %			**75%**	**95%**					
R-squared			**45%**	**83%**					

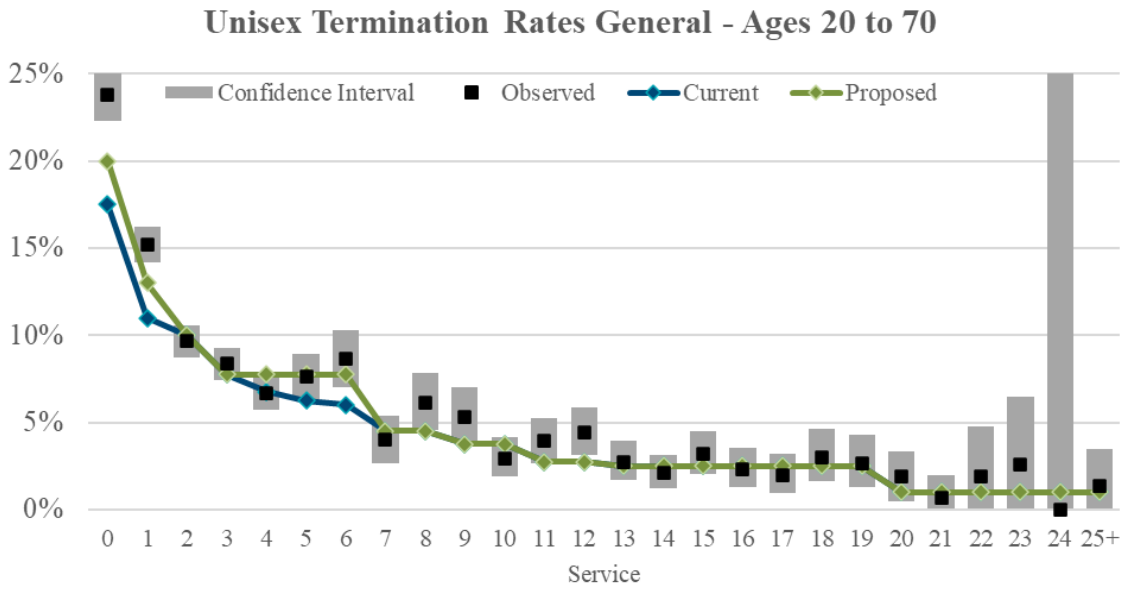
SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Termination rates reflect the frequency at which active members leave employment for reasons other than retirement, death, or disability. Currently, the termination rates are based on service for both Safety and General members. We have found that the rate of termination is more related to years of service rather than age. This methodology also avoids under-weighting the liabilities that can occur with using age-based rates only. The termination rates do not apply once members are eligible for a service retirement benefit. As with the retirement rate analysis, we have added data from the prior study to add more credibility to these calculations, for a total of six years of data.

See Appendices A and B for a full listing of the proposed and prior rates.

Table III-T1 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for General members, and Chart III-T1 below shows the information graphically along with the 90% confidence interval. The data shows slightly higher actual termination rates than expected under the current assumption and we are recommending increases in the General termination rates for some of the lower service bands. The proposed assumptions would reduce the aggregate A/E ratio from 121% to 110%, while the r-squared increases from 98% to 99%.

Chart III-T1



SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table III-T1

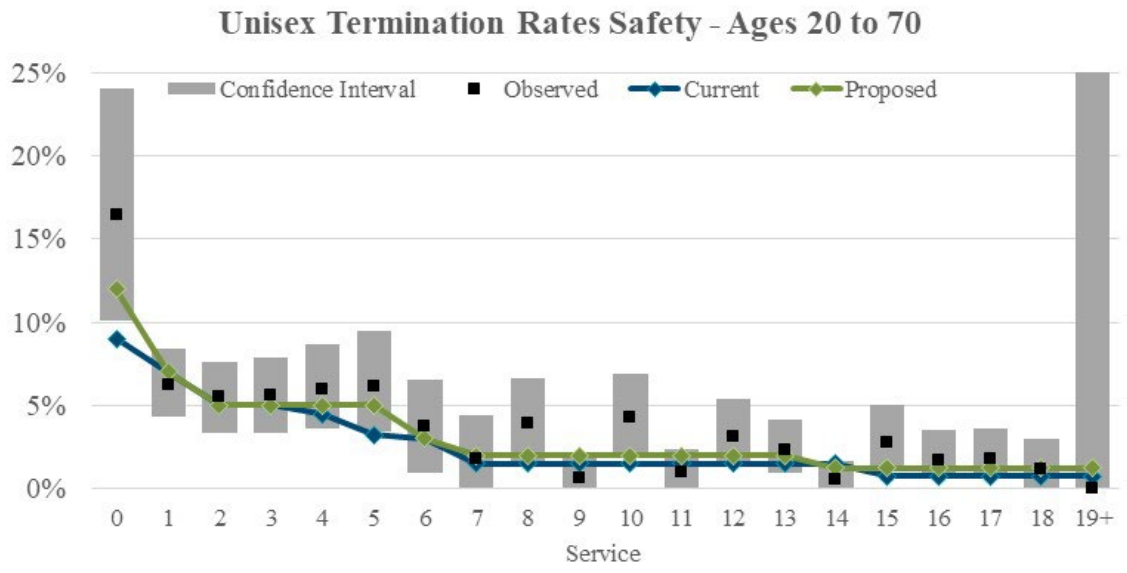
Unisex Termination Rates General - Ages 20 to 70									
		Terminations			Termination Rates			A/E Ratios	
Service	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
0	2,195	522	384	439	23.78%	17.50%	20.00%	136%	119%
1	3,366	512	370	438	15.21%	11.00%	13.00%	138%	117%
2	2,778	268	278	278	9.65%	10.00%	10.00%	96%	96%
3	2,347	196	182	182	8.35%	7.75%	7.75%	108%	108%
4	1,939	129	131	150	6.65%	6.75%	7.75%	99%	86%
5	1,132	86	71	88	7.60%	6.25%	7.75%	122%	98%
6	795	69	48	62	8.68%	6.00%	7.75%	145%	112%
7	597	24	27	27	4.02%	4.50%	4.50%	89%	89%
8	573	35	26	26	6.11%	4.50%	4.50%	136%	136%
9	544	29	20	20	5.33%	3.75%	3.75%	142%	142%
10	579	17	22	22	2.94%	3.75%	3.75%	78%	78%
11	608	24	17	17	3.95%	2.75%	2.75%	144%	144%
12	613	27	17	17	4.40%	2.75%	2.75%	160%	160%
13	586	16	15	15	2.73%	2.50%	2.50%	109%	109%
14	575	12	14	14	2.09%	2.50%	2.50%	83%	83%
15	534	17	13	13	3.18%	2.50%	2.50%	127%	127%
16	477	11	12	12	2.31%	2.50%	2.50%	92%	92%
17	410	8	10	10	1.95%	2.50%	2.50%	78%	78%
18	366	11	9	9	3.01%	2.50%	2.50%	120%	120%
19	303	8	8	8	2.64%	2.50%	2.50%	106%	106%
20	209	4	2	2	1.91%	1.00%	1.00%	191%	191%
21	154	1	2	2	0.65%	1.00%	1.00%	65%	65%
22	105	2	1	1	1.90%	1.00%	1.00%	190%	190%
23	77	2	1	1	2.60%	1.00%	1.00%	260%	260%
24	58	0	1	1	0.00%	1.00%	1.00%	0%	0%
25+	145	2	1	1	1.38%	1.00%	1.00%	138%	138%
TOTAL	**22,065**	**2,032**	**1,681**	**1,853**	**9.21%**	**7.62%**	**8.40%**	**121%**	**110%**
Confidence Interval %			**73%**	**77%**					
R-squared			**98%**	**99%**					

SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table III-T2 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart III-T2 below shows the information graphically along with the 90% confidence interval.

The data shows slightly higher actual termination rates at most service levels than expected under the current assumption. In aggregate, the proposed assumptions increase the assumed rates of termination. The proposal decreases the aggregate A/E ratio from 129% to 113%. The r-squared increases from 86% to 90%.

Chart III-T2



SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table III-T2

Unisex Termination Rates Safety - Ages 20 to 70									
		Terminations			Termination Rates			A/E Ratios	
Service	Exposures	Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
0	79	13	7	9	16.46%	9.00%	12.00%	183%	137%
1	368	23	26	26	6.25%	7.00%	7.00%	89%	89%
2	327	18	16	16	5.50%	5.00%	5.00%	110%	110%
3	265	15	13	13	5.66%	5.00%	5.00%	113%	113%
4	219	13	10	11	5.94%	4.50%	5.00%	132%	119%
5	147	9	5	7	6.12%	3.25%	5.00%	188%	122%
6	107	4	3	3	3.74%	3.00%	3.00%	125%	125%
7	113	2	2	2	1.77%	1.50%	2.00%	118%	88%
8	151	6	2	3	3.97%	1.50%	2.00%	265%	199%
9	160	1	2	3	0.63%	1.50%	2.00%	42%	31%
10	188	8	3	4	4.26%	1.50%	2.00%	284%	213%
11	207	2	3	4	0.97%	1.50%	2.00%	64%	48%
12	223	7	3	4	3.14%	1.50%	2.00%	209%	157%
13	216	5	3	4	2.31%	1.50%	2.00%	154%	116%
14	184	1	3	2	0.54%	1.50%	1.25%	36%	43%
15	179	5	1	2	2.79%	0.75%	1.25%	372%	223%
16	172	3	1	2	1.74%	0.75%	1.25%	233%	140%
17	167	3	1	2	1.80%	0.75%	1.25%	240%	144%
18	166	2	1	2	1.20%	0.75%	1.25%	161%	96%
19+	141	0	1	2	0.00%	0.75%	1.25%	0%	0%
TOTAL	**3,779**	**140**	**108**	**124**	**3.70%**	**2.86%**	**3.28%**	**129%**	**113%**
Confidence Interval %			**80%**	**90%**					
R-squared			**86%**	**90%**					

SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Refund Rates and Reciprocity

When a vested member terminates employment, they have the option of receiving a refund of contributions with interest or a deferred annuity. If a member terminates employment and works for a reciprocal employer, the member's retirement benefit is ultimately based on the member's service with SJCERA and the highest Final Compensation based on employment with any reciprocal employer.

Tables III-T3 and III-T4 show the results of our analysis of refunds for General and Safety members for the period from January 1, 2016 through December 31, 2021. We are recommending decreases to the refund assumptions for General and Safety members with less than 15 years of service.

Table III-T3

General Members					
	Total		% of	Assumptions	
Service	Terminations	Refunds	Total	Current	Proposed
0 - 4	1,627	722	44.4%	60.0%	50.0%
5 - 14	339	73	21.5%	30.0%	25.0%
15+	66	8	12.1%	10.0%	10.0%
Total	2,032	803	39.5%		

Table III-T4

Safety Members					
	Total		% of	Assumptions	
Service	Terminations	Refunds	Total	Current	Proposed
0 - 4	82	37	45.1%	60.0%	50.0%
5 - 14	45	5	11.1%	30.0%	20.0%
15+	13	2	15.4%	15.0%	15.0%
Total	140	44	31.4%		

SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES

Table III-T5 below shows the results of our analysis of members who have retired from a deferred status, for the period from January 1, 2016 through December 31, 2021. We recommend increasing the reciprocity assumption for General members with 15 or more years of service.

Table III-T5

Service	Total Vested Retirees	Reciprocal Retirees	% of Total	Current Assumption	Proposed Assumption
General					
0 - 4	56	43	76.8%	75.0%	75.0%
5 - 14	153	39	25.5%	25.0%	25.0%
15+	46	22	47.8%	30.0%	40.0%
Total	255	104	40.8%		
Safety					
0 - 4	8	7	87.5%	66.7%	66.7%
5 - 9	15	8	53.3%	50.0%	50.0%
15+	10	3	30.0%	50.0%	50.0%
Total	33	18	54.5%		

Table III-T6 shows the results of our analysis of the age at which vested terminated and transferred members with outgoing reciprocity decide to retire. The current assumptions are that vested terminated General members will commence payment at age 58, and that vested terminated Safety members will commence payment at age 50, unless they have outgoing reciprocity, in which case they are assumed to begin receiving benefits at age 53. The recent experience is consistent with the current assumptions so we are not recommending any change to the commencement age assumptions for General or Safety members.

Table III-T6

Average Retirement Age for Retirees from Vested Status

	General				Safety			
	Reciprocity		Vested		Reciprocity		Vested	
Calendar Year	# of New Retirees	Retirement Age	# of New Retirees	Retirement Age	# of New Retirees	Retirement Age	# of New Retirees	Retirement Age
2016	12	57.6	12	57.0	1	55.6	0	0.0
2017	13	61.3	14	58.0	4	53.3	5	52.2
2018	10	58.9	27	55.5	2	56.5	1	50.0
2019	19	61.0	19	60.8	1	53.0	1	54.3
2020	10	58.7	20	58.3	1	50.0	1	50.0
2021	11	59.9	9	57.0	4	55.2	1	50.0
Total	**75**	**59.8**	**101**	**57.7**	**13**	**54.3**	**9**	**51.7**

As stated earlier, if a member terminates employment and works for a reciprocal employer, the member's retirement benefit is ultimately computed using the highest Final Compensation based

on employment any reciprocal employer. We recommend that the assumption used to project pay during employment with the reciprocal employer continue to be based on the wage growth assumption, compounded by the ultimate merit pay increase assumption described earlier in this report. Therefore, the recommended total pay growth assumptions for members in reciprocal status remain at 3.52% for General members and 4.29% for Safety members.

Upon further review of the data, we also continue to recommend projecting salary increases for reciprocal members from the year of the members' most recent reported salary to their assumed retirement age.

SECTION III – DEMOGRAPHIC ASSUMPTIONS

DISABILITY RATES

This section analyzes the incidence of disability by the age of the employee. The rates analyzed are "total disability" rates that include both service and non-service related disabilities. Then a separate assumption is used to determine the percentage of the disabilities that are service versus non-service related. There are separate sets of assumptions for General male and female members and Safety members. The disability decrement is only applied after members are eligible for disability benefits.

The amount of disability experience is fairly limited. To improve the credibility of the data, we have aggregated the experience of the past three years with that of the prior experience study (2016-2021). There are only 98 disabilities during the last six years for Safety and General members combined.

See Appendices A and B for a full listing of the proposed and prior rates.

Table III-D1 on the following page shows the calculation of actual-to-expected ratios and the r-squared statistic for all disabilities for female General members, and Chart III-D1 shows the information graphically.

The data shows actual disability rates that are lower than the current assumption. We are recommending using the 75% of the most recent CalPERS' Miscellaneous State disability table for females. The proposed assumptions decrease the assumed disabilities for most age bands, resulting in an increase in the A/E ratio from 42% to 85%. The r-squared increases from 50% to 89%.

We are recommending a small change in the assumptions related to the incidence of duty-related vs. non-duty related disabilities for General female members only. Previously, it was assumed that 25% of female General disabilities were service related. During the previous six years about 44% of the disabilities were duty-related. As a result, we are recommending an increase in the assumption to 35% for duty-related female disabilities. The General male experience during this timeframe showed 90% of duty-related disabilities with an assumption of 80%. We are not recommending any change for males at this time.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Chart III-D1

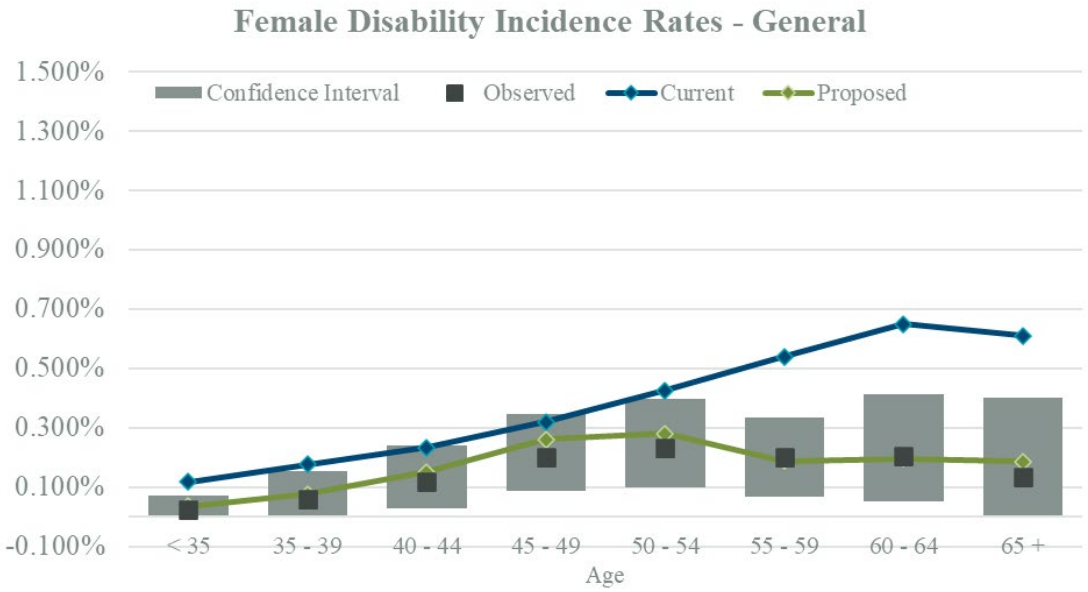


Table III-D1

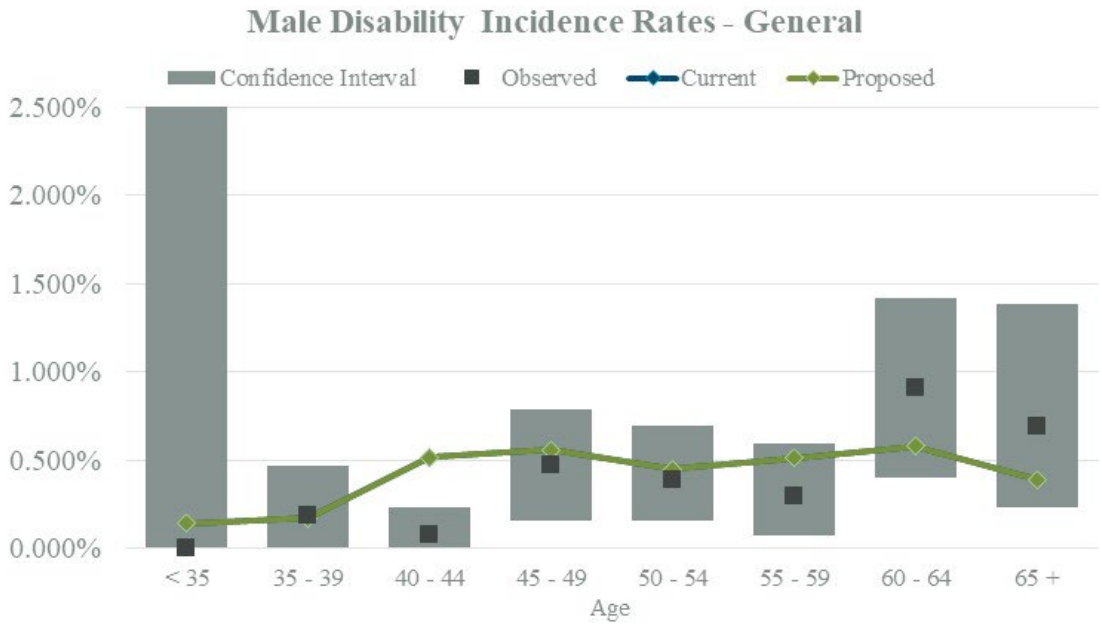
Female Disability Incidence Rates - General									
Age Band	Exposures	Disabilities			Average Disability Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
< 35	4,242	1.0	5.0	1.5	0.02%	0.12%	0.04%	20%	65%
35 - 39	3,274	2.0	5.8	2.5	0.06%	0.18%	0.08%	35%	81%
40 - 44	3,333	4.0	7.8	5.0	0.12%	0.23%	0.15%	51%	79%
45 - 49	3,472	7.0	11.1	9.1	0.20%	0.32%	0.26%	63%	77%
50 - 54	3,019	7.0	12.9	8.5	0.23%	0.43%	0.28%	54%	82%
55 - 59	2,983	6.0	16.1	5.6	0.20%	0.54%	0.19%	37%	106%
60 - 64	1,944	4.0	12.6	3.8	0.21%	0.65%	0.20%	32%	104%
Subtotal	**18,025**	**30.0**	**66.3**	**34.6**	**0.17%**	**0.37%**	**0.19%**	**45%**	**87%**
65 +	750	1.0	4.6	1.4	0.13%	0.61%	0.19%	22%	71%
TOTAL	**23,017**	**32.0**	**75.9**	**37.5**	**0.14%**	**0.33%**	**0.16%**	**42%**	**85%**
Confidence Interval %			**33%**	**100%**					
R-squared			**50%**	**89%**					

SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Table III-D2 on the next page shows the calculation of actual-to-expected ratios and the r-squared statistic for male General members, and Chart III-D2 below shows the information graphically.

The data shows that the number of disabilities are slightly lower than the number expected under the current assumption. However, we are not proposing any changes to the total disability assumption for male General members. The current assumption has an A/E ratio of 79%. The r-squared is 9%.

Chart III-D2



SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Table III-D2

Male Disability Incidence Rates - General									
Age Band	Exposures	Disabilities			Average Disability Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
< 35	1,646	0.0	2.4	2.4	0.00%	0.14%	0.14%	0%	0%
35 - 39	1,059	2.0	1.8	1.8	0.19%	0.17%	0.17%	108%	108%
40 - 44	1,266	1.0	6.6	6.6	0.08%	0.52%	0.52%	15%	15%
45 - 49	1,271	6.0	7.1	7.1	0.47%	0.56%	0.56%	85%	85%
50 - 54	1,296	5.0	5.9	5.9	0.39%	0.45%	0.45%	85%	85%
55 - 59	1,344	4.0	6.9	6.9	0.30%	0.51%	0.51%	58%	58%
60 - 64	985	9.0	5.7	5.7	0.91%	0.58%	0.58%	157%	157%
Subtotal	**7,221**	**27.0**	**34.0**	**34.0**	**0.37%**	**0.47%**	**0.47%**	**79%**	**79%**
65 +	433	3.0	1.7	1.7	0.69%	0.39%	0.39%	178%	178%
TOTAL	**9,300**	**30.0**	**38.1**	**38.1**	**0.32%**	**0.41%**	**0.41%**	**79%**	**79%**
Confidence Interval %			**83%**	**83%**					
R-squared			**9%**	**9%**					

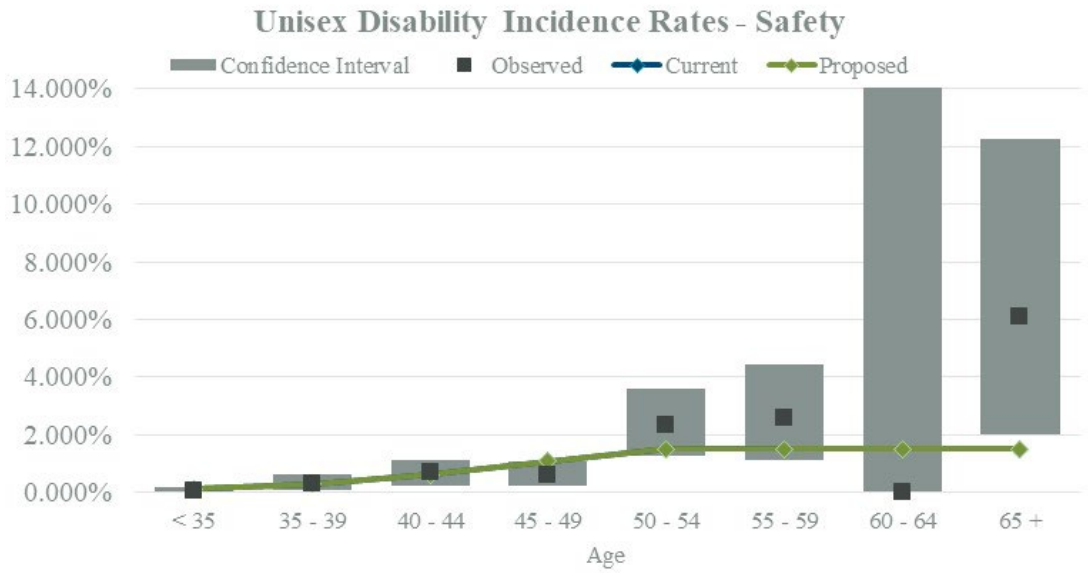
SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Table III-D3 on the next page shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart III-D3 below shows the information graphically.

The data shows that the number of disabilities are slightly higher for ages 50 or greater than the number expected under the current assumption. This dynamic is not expected to have a significant impact on the value of the Plan's benefit since most Safety members who work after age 50 will receive a service retirement benefit greater than the disability benefit. For this reason, we are not proposing any changes to the total disability assumption for Safety members. The current assumption has an A/E ratio of 110%. The r-squared is 39%.

34 of the 36 Safety active members who became disabled during the experience study period (2016-2021) were service-connected disabilities, a percentage of 94.4%. We are continuing to recommend that 95% of Safety disabilities are assumed to be service-connected, and to assume a refund of contributions for nonservice-connected disabilities before a member reaches five years of service.

Chart III-D3



SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Table III-D3

Unisex Disability Incidence Rates - Safety									
Age Band	Exposures	Disabilities			Average Disability Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
< 35	1,458	1.0	2.0	2.0	0.07%	0.14%	0.14%	50%	50%
35 - 39	938	3.0	2.9	2.9	0.32%	0.31%	0.31%	103%	103%
40 - 44	867	6.0	5.3	5.3	0.69%	0.61%	0.61%	113%	113%
45 - 49	830	5.0	9.1	9.1	0.60%	1.10%	1.10%	55%	55%
50 - 54	472	11.0	7.1	7.1	2.33%	1.50%	1.50%	155%	155%
55 - 59	271	7.0	4.1	4.1	2.58%	1.50%	1.50%	172%	172%
60 - 64	104	0.0	1.6	1.6	0.00%	1.50%	1.50%	0%	0%
Subtotal	**3,482**	**32.0**	**30.0**	**30.0**	**0.92%**	**0.86%**	**0.86%**	**107%**	**107%**
65 +	49	3.0	0.7	0.7	6.12%	1.50%	1.50%	408%	408%
TOTAL	**4,989**	**36.0**	**32.8**	**32.8**	**0.72%**	**0.66%**	**0.66%**	**110%**	**110%**
Confidence Interval %			**83%**	**83%**					
R-squared			**39%**	**39%**					

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES

Post-retirement mortality assumptions are typically developed separately by gender for both healthy annuitants and disabled annuitants. Pre-retirement mortality assumptions are developed separately for males and females. Unlike most of the other demographic assumptions that rely exclusively on the experience of the plan, for mortality, standard mortality tables and projection scales serve as the primary basis for the assumption.

In the prior study, SJCERA elected to use the following assumptions:

Active members

- Public General 2010 Above-Median Income - PUBG-2010(A) – Employee Mortality Table, adjusted by 105% for General female members and no adjustment for General male members
- Public Safety - 2010 PUBS-2010 – Employee Mortality Table, adjusted by 98% for Safety male members and by 106% for Safety female members (with 10% of active Safety member deaths assumed to occur in the line of duty)

Healthy retirees and beneficiaries

- Public General 2010 Above-Median Income - PUBG-2010(A) - Retiree Mortality Table, adjusted by 104% for General female members and no adjustment for General male members
- Public Safety 2010 – PUBS-2010 - Retiree Mortality Table, adjusted by 102% for Safety male members and by 105% for Safety female members

Disabled members

- Public General 2010 - PUBG-2010 - Disabled Annuitant Mortality Table, adjusted by 104% for General male members and adjusted by 107% for General female members
- Public Safety 2010 – PUBS-2010 - Disabled Annuitant Mortality Table, adjusted by 104% for Safety male members and by 98% for Safety female members

Mortality improvements were projected generationally using the MP-2018 mortality improvement scale for all types of mortality.

SECTION III – DEMOGRAPHIC ASSUMPTIONS

MORTALITY RATES

CalPERS published new mortality tables in their 2021 experience study report which is based on data from 2000 to 2019. Overall, these tables are a better fit than the current Pub-2010 Mortality tables, based on national public sector plan data from 2008 to 2013. Therefore, we recommend using the new CalPERS tables for the analysis and SJCERA's mortality assumption.

The steps in our analysis are as follows:

1. Select a standard mortality table that is, based on experience, most closely matching the anticipated experience of SJCERA.
2. Compare actual SJCERA experience to what would have been predicted by the selected standard table for the period of the experience study.
3. Adjust the standard table either fully or partially depending on the level of credibility for SJCERA experience. This adjusted table is called the base table.
4. Select an appropriate standard mortality improvement projection scale and apply it to the base table.

As we have done in prior experience studies, we have combined the experience of the past three years with that of the prior three-year period in order to have a more robust dataset to review. After reviewing the data, we excluded 2020-2021 data, and used 2016-2019 data with a central study year of 2018 but also confirmed the reasonability of assuming using all six years.

Even with the use of six years of data, the SJCERA experience is only partially credible, based on standard statistical theory. We therefore recommend partially adjusting the 2021 CalPERS base tables to fit SJCERA's experience to develop a new base table. The rates for each age in the standard table are adjusted by a factor, where the factor is determined by multiplying the actual-to-expected ratio for the group (such as male retirees) by a credibility factor for the group. The credibility factor is equal to the square root of the number of deaths divided by 1,082, which is the number of deaths needed for full credibility (defined by a 90% probability that the observed rate is within 5% of the true rate). Where the adjustment is very close to 100%, we have elected not to recommend any adjustment to the base table.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES

Based on these adjustments, we are recommending the following base mortality table assumptions:

Active members

- CalPERS 2021 Preretirement Non-Industrial Mortality, with no adjustment, for General members
- CalPERS 2021 Preretirement Industrial Mortality blended with 2021 CalPERS Preretirement Non-Industrial Mortality, with no adjustment, for Safety members (with 10% of active Safety member deaths assumed to occur in the line of duty)

Healthy retirees and beneficiaries

- CalPERS 2021 Healthy Annuitant Mortality, adjusted by 105% for male members and no adjustment for female members, for both Safety and General members

Disabled members

- CalPERS 2021 Industrially Disabled Annuitant Mortality, with no adjustment, for Safety members and service-related disabilities for General members
- CalPERS 2021 Non-Industrially Disabled Annuitant Mortality for General members with non-service-related disability, with no adjustment

We recommend using 80% of the MP-2020 Scale for the basis of our analysis and projections, consistent with CalPERS mortality improvement projection scale that was adopted in their 2021 experience study. This projection scale aligns with CalPERS mortality improvement trends over the past 20 years.

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES

As shown in Table III-M1 below, our proposed mortality rates for healthy annuitants are close to recent experience. As described above, we applied a partial adjustment of 1.05 to the "Standard" CalPERS 2021 tables for the healthy annuitants to bring the A/E rates closer to 100%. However, these rates still reflect a margin for conservatism, because the SJCERA data cannot be considered fully credible, particularly for the disability mortality experience. To perform our comparisons, the applicable CalPERS base rates were projected generationally from their base year 2017 to the central study year 2018.

Table III-M1

Annuitant Mortality for all Groups										
				Weighted Deaths				Actual to Expected Ratios		
Annuitant Type	Exposures	Actual Deaths	Weighted Exposures	Actual	Current	Standard	Recommended	Current	Standard	Recommended
General Healthy Females	11,366	318	322,776,322	6,950,471	6,465,326	6,732,113	6,732,113	108%	103%	103%
General Healthy Males	5,974	211	222,635,371	6,265,893	5,251,788	5,639,523	5,921,499	119%	111%	106%
General Healthy Total	**17,340**	**529**	**545,411,693**	**13,216,364**	**11,717,114**	**12,371,636**	**12,653,613**	**113%**	**107%**	**104%**
Safety Healthy Females	1,135	16	47,578,067	839,293	849,294	740,988	740,988	99%	113%	113%
Safety Healthy Males	1,892	37	132,781,143	2,013,183	2,080,243	1,951,395	2,048,965	97%	103%	98%
Safety Healthy Total	**3,027**	**53**	**180,359,210**	**2,852,476**	**2,929,537**	**2,692,384**	**2,789,953**	**97%**	**106%**	**102%**
General Service-Connected Disabled Females	532	11	12,759,288	322,708	195,607	250,805	250,805	165%	129%	129%
General Service-Connected Disabled Males	437	9	11,238,251	205,001	192,801	203,271	203,271	106%	101%	101%
General Nonservice-Connected Disabled Females	468	18	7,611,824	275,562	101,646	197,663	197,663	271%	139%	139%
General Nonservice-Connected Disabled Males	165	7	2,805,515	139,743	50,628	107,127	107,127	276%	130%	130%
General Disabled Total	**1,602**	**45**	**34,414,878**	**943,014**	**540,682**	**758,866**	**758,866**	**174%**	**124%**	**116%**
Safety Disabled Females	251	1	10,327,355	62,821	86,648	105,558	105,558	73%	60%	60%
Safety Disabled Males	605	12	33,604,732	642,203	627,550	710,478	710,478	102%	90%	90%
Safety Disabled Total	**856**	**13**	**43,932,087**	**705,024**	**714,198**	**816,036**	**816,036**	**99%**	**86%**	**86%**
Total	**22,825**	**640**	**804,117,868**	**17,716,878**	**15,901,530**	**16,638,922**	**17,018,468**	**111%**	**106%**	**104%**

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES

Rather than weighting the experience based on the number of members living and dying, we have weighted the experience based on benefit size (salary for current active members). This approach has been recommended by the Retirement Plans Experience Committee (RPEC) of the Society of Actuaries, since members with larger benefits are expected to live longer, and a benefit-weighted approach helps avoid underestimating the liabilities.

The match between the actual and expected experience across all statuses (active, retired, and disabled) is close under the proposed assumptions: 104%.

Mortality Assumptions for Employee Contribution Rates

For purposes of determining employee contribution rates, the use of generational mortality improvements is impractical from an administrative perspective. Therefore, we recommend using the base mortality tables described above (various CalPERS 2021 tables with SJCERA-specific adjustments) projected using 80% of Scale MP-2020 from 2017 to 2043 for General and from 2017 to 2045 for Safety Members. These static projections are intended to approximate generational mortality improvements. Adjustments of 105% for male and 100% for female members for both General and Safety members are applied as well.

The projection periods are based upon the duration of active liabilities for the respective groups, and the period during which the associated employee contribution rates will be in use. The employee contribution rates are also blended using a male/female weighting of 29%/71% for General Members and 75% /25% for Safety members.

We anticipate that these mortality assumptions will be used to determine the employee contribution rates in effect for the period of January 1, 2023 through December 31, 2025. We also anticipate that the mortality assumptions for this purpose will be updated again after the next experience study covering the period from January 1, 2022 through December 31, 2024.

Projected Pay and Benefit Payment Methodology

Terminal Pay Loads

The prior experience study demonstrated that Sick Leave Bank service is unlikely to have a significant impact on benefits. We have updated our analysis for the current study period and confirmed that this conclusion is still valid in Table III-O1 below.

Table III-O1

	Count	Avg Years of Service	Avg Sick Leave Hours	Avg Add'l Service	Percent Increase
Eligible	77	24.0	926	0.4	1.85%
Ineligible	6,252	9.5	0	0.0	0.00%
Total	6,329	9.7	11	0.0	0.06%

We also performed a comparison of the actual versus expected final average pay used in the service retirement benefit calculations to confirm any other substantial/recurring terminal pay increases in Table III-O2 below. For all service retirements which occurred over the past three years, we compared the actual final average pay used in the member's benefit calculation to the expected final average pay for that member reflected in the prior actuarial valuation (as an active member). We recommend adding a 1% load to expected final average pay for Safety active members based on the plan's experience below.

Table III-O2

Year of Retirement	Retirements from Active Status	Total Final Average Pay	Expected Final Average Pay	Actual / Expected
General				
2016	206	1,274,555	1,283,534	99.3%
2017	191	1,218,822	1,239,945	98.3%
2018	221	1,481,446	1,482,479	99.9%
2019	180	1,243,873	1,239,961	100.3%
2020	186	1,336,278	1,331,099	100.4%
2021	193	1,320,779	1,330,713	99.3%
Total	**1,177**	**7,875,754**	**7,907,731**	**99.6%**
Safety				
2016	38	366,612	363,177	100.9%
2017	29	220,090	219,471	100.3%
2018	31	244,345	237,701	102.8%
2019	38	346,223	337,656	102.5%
2020	33	277,577	274,844	101.0%
2021	36	278,140	282,416	98.5%
Total	**205**	**1,732,985**	**1,715,265**	**101.0%**

Valuation Methods

We are recommending a change to the methodology for projecting pay for the valuation year and concur with the audit findings of the January 1, 2021 actuarial valuation that active member projected pay included an extra half-year of increase for the valuation year. Thus, we are updating our method to remove the additional increase in our valuation procedures.

We are also updating the benefit payment timing in our software to use end of the month instead of beginning of the month payments to be consistent with SJCERA's administrative practices.

Family Composition

The current assumption is that 75% of active male and 55% of active female SJCERA participants will have beneficiaries eligible for an unreduced (i.e. subsidized) 60% Joint and Survivor allowance (100% for Duty Disability). Table III-O3 shows the results of the analysis during the experience study period for members who retired or became disabled. We recommend maintaining this assumption. There are a small number of married retirees who elect a form other than the unreduced 60% Joint and Survivor allowance. Therefore we are also recommending an additional assumption that 90% of these non-duty disabled participants with eligible beneficiaries elect the unreduced benefit and 10% elect an optional form with a reduced benefit.

Table III-O3

Percent of Retired and Disabled Members with Spouses or Domestic Partners						
	Females			Males		
Calendar Year	Disabled and Retirees	Eligible Spouses	Percent Eligible	Disabled and Retirees	Eligible Spouses	Percent Eligible
2016	188	115	61.2%	102	73	71.6%
2017	160	83	51.9%	85	63	74.1%
2018	188	115	61.2%	102	73	71.6%
2019	160	83	51.9%	85	63	74.1%
2020	158	87	55.1%	90	72	80.0%
2021	163	93	57.1%	88	69	78.4%
Total	1,017	576	56.6%	552	413	74.8%

SECTION III – DEMOGRAPHIC ASSUMPTIONS
OTHER DEMOGRAPHIC ASSUMPTIONS

Age Difference of Qualified Beneficiary

The current assumption is the spouse of a male member is expected to be three years younger while the spouse of a female member is expected to be two years older. Table III-O4 compiles the average age difference for members who retired or became disabled during 2016 - 2021 between spouses and domestic partners. This information is used to predict spouse information for future retirees. We are not recommending any changes to this assumption.

Table III-O4

Age Difference Between Retired or Disabled Members and Their Spouses or Domestic Partners								
	Females				Males			
Calendar Year	Eligible Spouses	Member Age	Spouse Age	Difference	Eligible Spouses	Member Age	Spouse Age	Difference
2016	87	59.92	61.05	(1.13)	81	60.41	58.07	2.34
2017	85	61.07	62.58	(1.51)	86	60.04	56.42	3.63
2018	122	59.25	61.97	(2.72)	83	60.03	57.65	2.38
2019	90	59.94	61.51	(1.57)	68	58.74	56.48	2.26
2020	97	59.46	62.18	(2.72)	76	59.62	56.18	3.44
2021	101	59.92	61.88	(1.96)	78	59.77	57.30	2.47
Total	481	59.86	61.87	(2.01)	394	59.81	56.98	2.83

Plan Expenses

An allowance of $5,035,179 for Plan administrative expenses was included in the annual cost calculation in the prior valuation and was expected to increase with CPI by 2.75% to $5,174,000. In Table III-O5 below, the Plan's administrative expenses, adjusted for actual CPI increases to the current year, have averaged slightly less, $4,972,184, than this amount during the last three years. However, due to the higher CPI increase in 2022 and upcoming benefit system update, we recommend maintaining the Plan's assumed administrative expenses of $5,174,000 for 2022, to be split between employees and employers based on their share of the overall contributions. Expenses are expected to grow with the cost of living (by 2.75% per year) in future years.

Table III-O5

Calendar Year	Admin Expense	Bay Area CPI	Admin Expense w/ CPI to 2022
2019	$ 4,931,163	3.18%	$ 5,349,700
2020	$ 4,536,455	1.69%	$ 4,769,881
2021	$ 4,639,439	3.40%	$ 4,796,970
Average	$ 4,702,352		$ 4,972,184

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

The recommended assumptions were reviewed with the Board at their July 7, 2022 meeting. The demographic assumptions are based on an experience study covering the period from January 1, 2019 through December 31, 2021.

1. Rate of Return

Assets are assumed to earn 7.00% or 6.75% net of investment expenses.

2. Administrative Expenses

Administrative expenses are assumed to be $5,173,647 for the next year, to be split between employees and employers based on their share of the overall contributions. Expenses are expected to grow with the cost of living (by 2.75% per year.)

3. Cost of Living

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 2.75% per year. This assumption is also used to project increases in the PEPRA wage cap.

4. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.6% per year.

5. Increases in Pay

Assumed pay increases for active Members consist of increases due to base salary adjustments plus service-based increase due to longevity and promotion, as shown below:

Pay Increases	Years of Service										
	0	1	2	3	4	5	6	7	8-9	10-14	15+
Base Increase	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Longevity & Promotion											
General	8.00%	7.00%	4.00%	4.00%	2.00%	2.00%	2.00%	2.00%	1.25%	1.00%	0.50%
Safety	10.00%	10.00%	5.00%	5.00%	5.00%	2.25%	1.25%	1.25%	1.25%	1.25%	1.25%
Total (Compound)											
General	11.24%	10.21%	7.12%	7.12%	5.06%	5.06%	5.06%	5.06%	4.29%	4.03%	3.52%
Safety	13.30%	13.30%	8.15%	8.15%	8.15%	5.32%	4.29%	4.29%	4.29%	4.29%	4.29%

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

6. Family Composition

Percentage married for all active members who retire, become disabled, or die during active service is shown in the following table. Male members are assumed to be three years older than their spouses, and female members are assumed to be two years younger than their spouses. It is assumed that 90% of participants with eligible beneficiaries who do not have a service-related disability elect the 60% Joint and Survivor allowance.

Percentage Married	
Gender	Percentage
Males	75%
Females	55%

7. Rates of Termination

Sample rates of termination are show in the following table.

Rates of Termination*		
Years of Service	General	Safety
0	20.00%	12.00%
1	13.00%	7.00%
2	10.00%	5.00%
3	7.75%	5.00%
4	7.75%	5.00%
5	7.75%	5.00%
6	7.75%	3.00%
7	4.50%	2.00%
8	4.50%	2.00%
9	3.75%	2.00%
10	3.75%	2.00%
11-12	2.75%	2.00%
13	2.50%	2.00%
14-19	2.50%	1.25%
20-29	1.00%	0.00%
30+	0.00%	0.00%

* Termination rates do not apply once a member is eligible for retirement.

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

8. Withdrawal

Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits.

50% of all General Member terminations with less than five years of service, 25% of those with five to 14 years of service, and 10% of those with 15 or more years of service, are assumed to take a refund of contributions.

50% of all Safety Member terminations with less than five years of service, 20% of those with five to 14 years of service, and 15% of those with 15 or more years of service, are assumed to take a refund of contributions.

9. Vested Termination and Reciprocal Transfers

Rates of vested termination apply to active Members who terminate their employment and leave their member contributions on deposit with the Plan.

50% of all General Member terminations with less than five years of service, 75% of those with five to 14 years of service, and 90% of those with 15 or more years of service, are assumed to leave their contributions on deposit.

50% of all Safety Member terminations with less than five years of service, 80% of those with five to 14 years of service, and 85% of those with 15 or more years of service, are assumed to leave their contributions on deposit.

Vested terminated General Members are assumed to begin receiving benefits at age 58; vested terminated Safety Members are assumed to begin receiving benefits at age 50, unless they have outgoing reciprocity, in which case they are assumed to begin receiving benefits at age 53.

75% of vested terminated General Members with less than five years of service, 25% of those with five to 14 years of service, and 40% of those with 15 or more years of service, are assumed to be reciprocal.

67% of vested terminated Safety Members with less than five years of service, and 50% of those with five or more years of service, are assumed to be reciprocal.

Final average pay for General Members who terminate with reciprocity is assumed to increase by 3.52% per year until their assumed retirement date. Final average pay for Safety Members who terminate with reciprocity is assumed to increase by 4.29% per year until their assumed retirement date.

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

10. Rates of Service-Connected Disability

Sample service-connected disability rates of active participants are provided in the table below.

Rates of Svc Disability				
Age	General Male	General Female	Safety Male	Safety Female
22	0.094%	0.006%	0.048%	0.048%
27	0.107%	0.006%	0.086%	0.089%
32	0.122%	0.010%	0.161%	0.166%
37	0.139%	0.018%	0.296%	0.305%
42	0.414%	0.037%	0.565%	0.592%
47	0.446%	0.067%	1.023%	1.101%
52	0.361%	0.072%	1.425%	1.425%
57	0.410%	0.045%	1.425%	1.425%
62	0.470%	0.050%	1.425%	1.425%

11. Rates of Nonservice-Connected Disability

Sample nonservice-connected disability rates of active participants are provided in the table below.

Rates of Non-Svc Disability				
Age	General Male	General Female	Safety Male	Safety Female
22	0.023%	0.017%	0.003%	0.003%
27	0.027%	0.019%	0.005%	0.005%
32	0.030%	0.031%	0.008%	0.009%
37	0.035%	0.055%	0.016%	0.016%
42	0.104%	0.112%	0.030%	0.031%
47	0.112%	0.200%	0.054%	0.058%
52	0.090%	0.217%	0.075%	0.075%
57	0.102%	0.136%	0.075%	0.075%
62	0.118%	0.150%	0.075%	0.075%

12. Rates of Mortality for Healthy Lives

Mortality rates for General active members are based on the sex distinct 2021 CalPERS Pre-Retirement Non-Industrial Mortality Table, with generational mortality improvements projected from 2017 using 80% of Projection Scale MP-2020.

Mortality rates for Safety active members are based on the sum of the rates from the 2021 CalPERS Industrial and Non-Industrial Mortality tables, with generational mortality

improvements projected from 2017 using 80% of Projection Scale MP-2020. 10% of Safety member active deaths are assumed to occur in the line of duty.

Mortality rates for healthy General annuitants are based on the sex distinct 2021 CalPERS Healthy Annuitant Mortality Table, with generational mortality improvements projected from 2017 using 80% of Projection Scale MP-2020, and a partial credibility adjustment of 1.05 for males and no adjustment for females.

Mortality rates for Safety annuitants are based on the sex distinct 2021 CalPERS Healthy Annuitant Mortality Table, with generational mortality improvements projected from 2017 using 80% of Projection Scale MP-2020, and a partial credibility adjustment of 1.05 for males and no adjustment for females.

13. Rates of Mortality for Disabled Retirees

Mortality rates for General disabled annuitants are based on status. Rates for General disabled annuitants with a service-related disability are based on the sex distinct 2021 CalPERS Industrially Disabled Annuitant Mortality Table, with generational mortality improvements projected from 2017 using 80% of Projection Scale MP-2020. Rates for General disabled annuitants with a non-service-related disability are based on the sex distinct 2021 CalPERS Non-Industrially Disabled Annuitant Mortality Table, with generational mortality improvements projected from 2017 using 80% of Projection Scale MP-2020.

Mortality rates for Safety disabled annuitants are based on the sex distinct 2021 CalPERS Industrially Disabled Mortality Table, with generational mortality improvements projected from 2017 using Projection 80% of Scale MP-2020.

14. Mortality Improvement

The mortality assumptions employ a fully generational mortality improvement projection from the base year of the CalPERS mortality tables (2017) using 80% of Scale MP-2020.

15. Adjustment for Service Purchases

SJCERA provides Cheiron with the amount of service that active employees are eligible to purchase. We include this service when calculating the employees' benefit eligibility. Half of eligible service purchases, which have not been purchased by the members, are included in the employees' Credited Service, as employees will pay approximately half of the normal cost for these benefits when purchasing this service.

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

16. Assumptions for Employee Contribution Rates

Mortality rates are the base mortality tables described above, projected using 80% of Scale MP-2020 from 2017 to 2043 for General Members and to 2045 for Safety Members. The projection periods are based on the duration of active liabilities for the respective groups, and the period during which the associated contribution rates will be in use. The employee contribution rates are also blended using a male/female weighting of 29%/71% for General Members and 75%/25% for Safety members.

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

17. Rates of Retirement

Rates of retirement are based on age and service according to the following table.

Rates of Retirement								
	General Male Years of Service			General Female Years of Service			Safety Years of Service	
Age	5-9	10-29	30+	5-9	10-29	30+	5-19	20+
45	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
46	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
47	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
48	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
49	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
50	1.00%	3.00%	5.00%	1.00%	3.50%	4.50%	7.50%	17.50%
51	1.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	17.50%
52	1.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	17.50%
53	1.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	17.50%
54	1.00%	3.00%	10.00%	5.75%	3.50%	4.50%	5.00%	17.50%
55	2.50%	6.50%	10.00%	2.50%	3.50%	4.50%	5.00%	17.50%
56	2.50%	4.00%	10.00%	1.50%	7.00%	15.00%	15.00%	17.50%
57	2.50%	4.00%	10.00%	1.50%	7.00%	15.00%	15.00%	20.00%
58	2.50%	4.00%	10.00%	1.50%	7.00%	15.00%	15.00%	20.00%
59	2.50%	9.00%	27.50%	2.00%	7.00%	15.00%	10.00%	30.00%
60	5.00%	9.00%	27.50%	6.25%	12.50%	25.00%	10.00%	30.00%
61	5.00%	15.00%	27.50%	6.25%	12.50%	30.00%	10.00%	30.00%
62	5.00%	30.00%	40.00%	18.50%	25.00%	35.00%	20.00%	30.00%
63	5.00%	25.00%	40.00%	5.00%	25.00%	35.00%	20.00%	30.00%
64	5.00%	25.00%	40.00%	9.00%	25.00%	35.00%	20.00%	50.00%
65	15.00%	25.00%	40.00%	12.50%	30.00%	35.00%	100.00%	100.00%
66	15.00%	35.00%	50.00%	25.00%	30.00%	30.00%	100.00%	100.00%
67	15.00%	30.00%	40.00%	25.00%	30.00%	30.00%	100.00%	100.00%
68	15.00%	30.00%	30.00%	25.00%	30.00%	30.00%	100.00%	100.00%
69	15.00%	40.00%	30.00%	25.00%	30.00%	30.00%	100.00%	100.00%
70	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	100.00%	100.00%
71	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	100.00%	100.00%
72	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	100.00%	100.00%
73	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	100.00%	100.00%
74	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	100.00%	100.00%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

The recommended assumptions were adopted by the Board at their July 12, 2019 meeting. The demographic assumptions are based on an experience study covering the period from January 1, 2016 through December 31, 2018. The rate of return, CPI, and pay increase assumptions were updated in the 2020 valuation.

1. Rate of Return

Assets are assumed to earn 7.00% net of investment expenses.

2. Administrative Expenses

Administrative expenses are assumed to be $5,035,179 for the next year, to be split between employees and employers based on their share of the overall contributions. Expenses are expected to grow with the cost of living (by 2.75% per year.)

3. Cost of Living

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 2.75% per year. This assumption is also used to project increases in the PEPRA wage cap.

4. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.6% per year.

5. Increases in Pay

Assumed pay increases for active Members consist of increases due to base salary adjustments plus service-based increase due to longevity and promotion, as shown below:

Pay Increases	Years of Service										
	0	1	2	3	4	5	6	7	8-9	10-14	15+
Base Increase	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Longevity & Promotion											
General	8.00%	7.00%	4.00%	4.00%	2.00%	2.00%	2.00%	2.00%	1.25%	1.00%	0.50%
Safety	10.00%	10.00%	5.00%	5.00%	5.00%	2.25%	1.25%	1.25%	1.25%	1.25%	1.25%
Total (Compound)											
General	11.24%	10.21%	7.12%	7.12%	5.06%	5.06%	5.06%	5.06%	4.29%	4.03%	3.52%
Safety	13.30%	13.30%	8.15%	8.15%	8.15%	5.32%	4.29%	4.29%	4.29%	4.29%	4.29%

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

6. Family Composition

Percentage married for all active members who retire, become disabled, or die during active service is shown in the following table. Male members are assumed to be three years older than their spouses, and female members are assumed to be two years younger than their spouses.

Percentage Married	
Gender	Percentage
Males	75%
Females	55%

7. Rates of Termination

Sample rates of termination are show in the following table.

Rates of Termination*		
Years of Service	General	Safety
0	17.50%	9.00%
1	11.00%	7.00%
2	10.00%	5.00%
3	7.75%	5.00%
4	6.75%	4.50%
5	6.25%	3.25%
6	6.00%	3.00%
7	4.50%	1.50%
8	4.50%	1.50%
9	3.75%	1.50%
10	3.75%	1.50%
11-12	2.75%	1.50%
13-19	2.50%	1.50%
20-29	1.00%	0.00%
30+	0.00%	0.00%

* Termination rates do not apply once a member is eligible for retirement.

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

8. Withdrawal

Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits.

60% of all General Member terminations with less than five years of service, 30% of those with five to 14 years of service, and 10% of those with 15 or more years of service, are assumed to take a refund of contributions.

60% of all Safety Member terminations with less than five years of service, 30% of those with five to 14 years of service, and 15% of those with 15 or more years of service, are assumed to take a refund of contributions.

9. Vested Termination and Reciprocal Transfers

Rates of vested termination apply to active Members who terminate their employment and leave their member contributions on deposit with the Plan.

40% of all General Member terminations with less than five years of service, 70% of those with 5 to 14 years of service, and 90% of those with 15 or more years of service, are assumed to leave their contributions on deposit.

40% of all Safety Member terminations with less than five years of service, 70% of those with five to 14 years of service, and 85% of those with more than 10 years of service, are assumed to leave their contributions on deposit.

Vested terminated General Members are assumed to begin receiving benefits at age 58; vested terminated Safety Members are assumed to begin receiving benefits at age 50, unless they have outgoing reciprocity, in which case they are assumed to begin receiving benefits at age 53.

75% of vested terminated General Members with less than five years of service, 25% of those with five to 14 years of service, and 30% of those with more than 15 years of service, are assumed to be reciprocal.

67% of vested terminated Safety Members with less than five years of service, and 50% of those with more than five years of service, are assumed to be reciprocal.

Final average pay for General Members who terminate with reciprocity is assumed to increase by 3.52% per year until their assumed retirement date.

Final average pay for Safety Members who terminate with reciprocity is assumed to increase by 4.29% per year until their assumed retirement date.

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

10. Rates of Service-Connected Disability

Sample service-connected disability rates of active participants are provided in the table below.

Rates of Svc Disability				
Age	General Male	General Female	Safety Male	Safety Female
22	0.094%	0.019%	0.048%	0.048%
27	0.107%	0.024%	0.086%	0.089%
32	0.122%	0.033%	0.161%	0.166%
37	0.139%	0.044%	0.296%	0.305%
42	0.414%	0.058%	0.565%	0.592%
47	0.446%	0.080%	1.023%	1.101%
52	0.361%	0.106%	1.425%	1.425%
57	0.410%	0.135%	1.425%	1.425%
62	0.470%	0.164%	1.425%	1.425%

11. Rates of Nonservice-Connected Disability

Sample nonservice-connected disability rates of active participants are provided in the table below.

Rates of Non-Svc Disability				
Age	General Male	General Female	Safety Male	Safety Female
22	0.023%	0.057%	0.003%	0.003%
27	0.027%	0.072%	0.005%	0.005%
32	0.030%	0.099%	0.008%	0.009%
37	0.035%	0.131%	0.016%	0.016%
42	0.104%	0.174%	0.030%	0.031%
47	0.112%	0.239%	0.054%	0.058%
52	0.090%	0.319%	0.075%	0.075%
57	0.102%	0.406%	0.075%	0.075%
62	0.118%	0.493%	0.075%	0.075%

12. Rates of Mortality for Healthy Lives

Mortality rates for General active members are based on the sex distinct Public General 2010 Above-Median Income Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2018, and a partial credibility adjustment of 1.05 for females and no adjustment for males.

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

Mortality rates for Safety active members are based on the sex distinct Public Safety 2010 Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2018, and a partial credibility adjustment of 0.98 for males and 1.06 for females. 10% of Safety member active deaths are assumed to occur in the line of duty.

Mortality rates for healthy General annuitants are based on the sex distinct Public General 2010 Above-Median Income Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2018, and a partial credibility adjustment of 1.04 for females and no adjustment for males.

Mortality rates for Safety annuitants are based on the sex distinct Public Safety 2010 Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2018, and a partial credibility adjustment of 1.02 for males and 1.05 for females.

13. Rates of Mortality for Disabled Retirees

Mortality rates for General disabled annuitants are based on the sex distinct Public General Disabled Annuitant 2010 Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2018, with a partial credibility adjustment of 1.04 for males and 1.07 for females.

Mortality rates for Safety disabled annuitants are based on the sex distinct Public Safety Disabled Annuitant 2010 Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2018, with a partial credibility adjustment of 1.04 for males and 0.98 for females.

14. Mortality Improvement

The mortality assumptions employ a fully generational mortality improvement projection from the base year of the Pub-2010 Mortality Tables using Scale MP-2018.

15. Adjustment for Service Purchases

SJCERA provides Cheiron with the amount of service that active employees are eligible to purchase. We include this service when calculating the employees' benefit eligibility. Half of eligible service purchases, which have not been purchased by the members, are included in the employees' Credited Service, as employees will pay approximately half of the normal cost for these benefits when purchasing this service.

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

16. Assumptions for Employee Contribution Rates

Mortality rates are the base mortality tables described above, projected using Scale MP-2018 from 2010 to 2040 for General Members and to 2041 for Safety Members. The projection periods are based on the duration of active liabilities for the respective groups, and the period during which the associated employee contribution rates will be in use. The employee contribution rates are also blended using a male/female weighting of 29%/71% for General Members and 75%/25% for Safety members.

17. Rates of Retirement

Rates of retirement are based on age and service according to the following table.

Rates of Retirement								
	General Male Years of Service			General Female Years of Service			Safety Years of Service	
Age	5-9	10-29	30+	5-9	10-29	30+	5-19	20+
45	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
46	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
47	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
48	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
49	0.00%	0.00%	5.00%	0.00%	0.00%	4.50%	0.00%	5.00%
50	3.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	15.00%
51	3.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	10.00%
52	3.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	10.00%
53	3.00%	3.00%	5.00%	1.00%	3.50%	4.50%	5.00%	20.00%
54	3.00%	3.00%	10.00%	5.75%	3.50%	4.50%	5.00%	20.00%
55	3.00%	6.50%	10.00%	2.50%	3.50%	4.50%	5.00%	20.00%
56	3.00%	4.00%	10.00%	1.50%	7.00%	15.00%	10.00%	20.00%
57	3.00%	4.00%	10.00%	1.50%	7.00%	15.00%	10.00%	20.00%
58	3.00%	4.00%	10.00%	1.50%	7.00%	15.00%	10.00%	20.00%
59	7.00%	9.00%	27.50%	2.00%	7.00%	15.00%	10.00%	15.00%
60	7.00%	9.00%	27.50%	6.25%	12.50%	25.00%	10.00%	30.00%
61	7.00%	15.00%	27.50%	6.25%	12.50%	25.00%	10.00%	30.00%
62	7.00%	30.00%	40.00%	18.50%	25.00%	35.00%	20.00%	30.00%
63	7.00%	25.00%	40.00%	5.00%	25.00%	35.00%	20.00%	30.00%
64	15.00%	25.00%	40.00%	9.00%	25.00%	35.00%	20.00%	50.00%
65	25.00%	25.00%	40.00%	12.50%	25.00%	35.00%	100.00%	100.00%
66	10.00%	35.00%	50.00%	25.00%	25.00%	30.00%	100.00%	100.00%
67	15.00%	30.00%	40.00%	25.00%	25.00%	30.00%	100.00%	100.00%
68	15.00%	30.00%	30.00%	25.00%	25.00%	30.00%	100.00%	100.00%
69	30.00%	40.00%	30.00%	25.00%	25.00%	30.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Classic Values, Innovative Advice