

## **Marin County Employees' Retirement Association**

### **Actuarial Experience Study for July 1, 2020 through June 30, 2023**

**Produced by Cheiron**

**February 2024**

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
Transmittal Letter.....	i
Section I      Executive Summary .....	1
Section II     Economic Assumptions .....	3
A.      Price Inflation.....	3
B.      Wage Inflation .....	7
C.      Payroll Growth.....	8
D.      COLA Growth .....	9
E.      Discount Rate.....	10
Section III    Demographic Assumptions.....	14
A.      Merit Salary Increases.....	14
B.      Retirement Rates .....	17
C.      Termination Rates .....	28
D.      Disability Rates.....	33
E.      Mortality Rates.....	36
F.      Other Demographic Assumptions.....	40
 <u>Appendices</u>	
Appendix A    Summary of Proposed Assumptions.....	44
Appendix B    Summary of Prior Assumptions.....	53

February 8, 2024

Board of Retirement  
Marin County Employees' Retirement Association  
1 McInnis Parkway, Suite 100  
San Rafael, CA 94903-2764

Dear Members of the Board:

The purpose of this report is to provide the results of an Actuarial Experience Study of the Marin County Employees' Retirement Association (MCERA) covering actuarial experience through June 30, 2023. This report is for the use of the MCERA Retirement Board in selecting assumptions to be used in actuarial valuations beginning June 30, 2023.

Cheiron utilizes ProVal, an actuarial valuation software program leased from Winklevoss Technologies (WinTech), to calculate liabilities and projected benefit payments. We have reviewed the underlying workings of this model to the degree feasible and consistent with Actuarial Standard of Practice No. 56 and believe them to be appropriate for the purposes of this experience study 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 Retirement Board of MCERA for the purposes described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

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

Sincerely,  
Cheiron

A handwritten signature in blue ink, reading "Graham Schmidt".

Graham A. Schmidt, FSA, EA, FCA, MAAA  
Principal Consulting Actuary

A handwritten signature in blue ink, reading "William R. Hallmark".

William R. Hallmark, ASA, EA, FCA, MAAA  
Consulting Actuary

## 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 taken together with no significant bias except when provisions for adverse deviation are explicitly included. The purpose of this experience study is to evaluate whether the current assumptions adequately reflect the long-term expectations for MCERA, 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 MCERA'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 and pensionable payroll 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.

We recommend maintaining the current economic assumptions, including a 6.75% long-term rate of return on Plan assets, a 2.50% annual increase in prices as measured by the Consumer Price Index (CPI), 3.00% annual wage increases, 2.75% annual pensionable payroll growth, and post-retirement COLA average growth rates of 1.9%, 2.4%, and 2.5%, for the 2.0%, 3.0% and 4.0% COLA caps, respectively. We note that other combinations of economic assumptions are also reasonable.

Both the real and nominal return expectation for this set of assumptions (4.25% and 6.75%, respectively) are somewhat more conservative than the 2023 10-year capital market expectations of Callan, the Plan's investment consultant, and the medium (10-year) and long-term (20 years or longer) of a survey of investment consultants published by Horizon Actuarial Services. However, there was a significant change in capital market assumptions this year, and the real and nominal return assumptions are consistent with the average of the 2022 and 2023 capital market expectations from these sources. Other data presented in this report indicate that the inflation and wage growth expectations recommended herein are reasonable.

### SUMMARY OF DEMOGRAPHIC ASSUMPTION CHANGES

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

- **Merit salary increases** – Increase Miscellaneous rates from 11 through 16 years of service and decrease the ultimate rate. Slightly increase rates for Safety members with less than five years of service and slightly decrease rates for 5 through 12 years of service.
- **Retirement rates** – Increase rates for 3% at 50 Safety members at ages less than 55 and 30 years or more of service, modify rates for 3% at 55 Safety members at all service levels. Update Miscellaneous PEPRA retirement rates to match Classic Miscellaneous members rates for those eligible to retire.

## SECTION I – EXECUTIVE SUMMARY

- **Termination rates** – Replace Safety member rates with unisex service-only table; set refund rates at 15 or more years of service to 0%.
- **Deferral age** – No changes.
- **Disability rates** – No changes
- **Mortality rates** – Change adjustment factor for Disabled male retirees from 1.00 to 0.95.
- **Other assumptions** – Decrease age difference for male retirees to two years older than spouse; decrease Classic sick leave adjustment to 2.0% and adjust pay methodology for Novato members; lower the Miscellaneous marriage assumption from 75% to 70%.

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

## COST OF ECONOMIC AND DEMOGRAPHIC ASSUMPTION CHANGES

No changes to the economic assumptions are proposed, and none of the changes to the demographic assumptions are expected to have a significant impact on the current contribution rates.

Table I-1 summarizes the estimated cost impact of the recommended changes to the demographic assumptions contained in this report in the next year, as well as the ultimate impact after the Unfunded Actuarial Liability (UAL) changes have been fully recognized in the amortization payments following the three-year ramp-up period reflected in the Plan's funding policy. The changes to the Novato terminal pay assumption and pay methodology will result in a reduction in the Unfunded Actuarial Liability (UAL) rate once fully phased-in, but the reduction is expected to be offset by the phase-in of liability losses reflected in the current year actuarial valuation report.

**Table I-1**

Estimated Impact on Contribution Rates from Demographic Assumption Changes (based on June 30, 2023 valuation results)									
Description	Change in Contribution Rate (Employee and Employer)								
	Total Normal Cost Rate			UAL Rate			Total Contribution Rate		
	County	Novato	San Rafael	County	Novato	San Rafael	County	Novato	San Rafael
<u>Proposed Demographic Assumptions</u>									
Merit Scale	-0.18%	-0.23%	-0.18%	-0.04%	-0.01%	-0.06%	-0.22%	-0.24%	-0.24%
Mortality Rates	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Retirement Rates	-0.10%	0.07%	-0.17%	0.00%	0.07%	0.01%	-0.10%	0.14%	-0.16%
Termination Rates	0.00%	-0.04%	-0.01%	0.01%	0.00%	0.01%	0.01%	-0.04%	0.00%
Withdrawal Rates	0.02%	0.07%	0.03%	0.00%	0.00%	0.00%	0.02%	0.07%	0.03%
Marriage and Spouse Age Differences	-0.05%	-0.13%	-0.08%	-0.02%	-0.06%	-0.03%	-0.07%	-0.19%	-0.11%
Load for Terminal Pay and Sick Leave	0.00%	0.76%	0.00%	0.00%	-0.27%	0.01%	0.00%	0.49%	0.01%
New Employee Rates	<u>0.00%</u>	<u>-0.01%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.01%</u>	<u>0.01%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.01%</u>
Contribution Rate Increase After Proposed Demographic Assumption Changes									
1st Smoothing Year	-0.31%	0.49%	-0.40%	-0.05%	-0.26%	-0.05%	-0.36%	0.23%	-0.45%
3rd Smoothing Year	-0.31%	0.49%	-0.40%	-0.16%	-3.35%	-0.15%	-0.47%	-2.86%	-0.55%

## 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 with no significant bias except when provisions for adverse deviation are explicitly included. The specific economic 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.
- **Payroll growth** – overall pensionable payroll growth used in the calculation of the unfunded liability amortization payment 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 to set the context, but primarily based our recommendations on expectations for the future.

### PRICE INFLATION

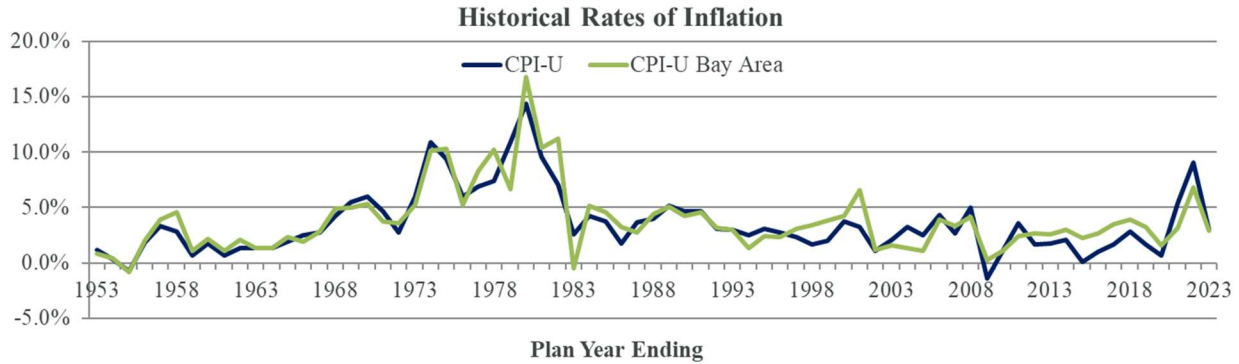
Long-term price inflation rates are the foundation of other economic assumptions. In a growing economy, wages, and investments are expected to grow at the underlying inflation rate plus some additional real growth rate, whether it reflects productivity in terms of wages or risk premiums in terms of investments.

### Historical Data

Chart II-1 below shows inflation (CPI-U) for the U.S. and for the Bay Area by Plan year (ending June 30) since 1953.

## SECTION II – ECONOMIC ASSUMPTIONS PRICE INFLATION

Chart II-1



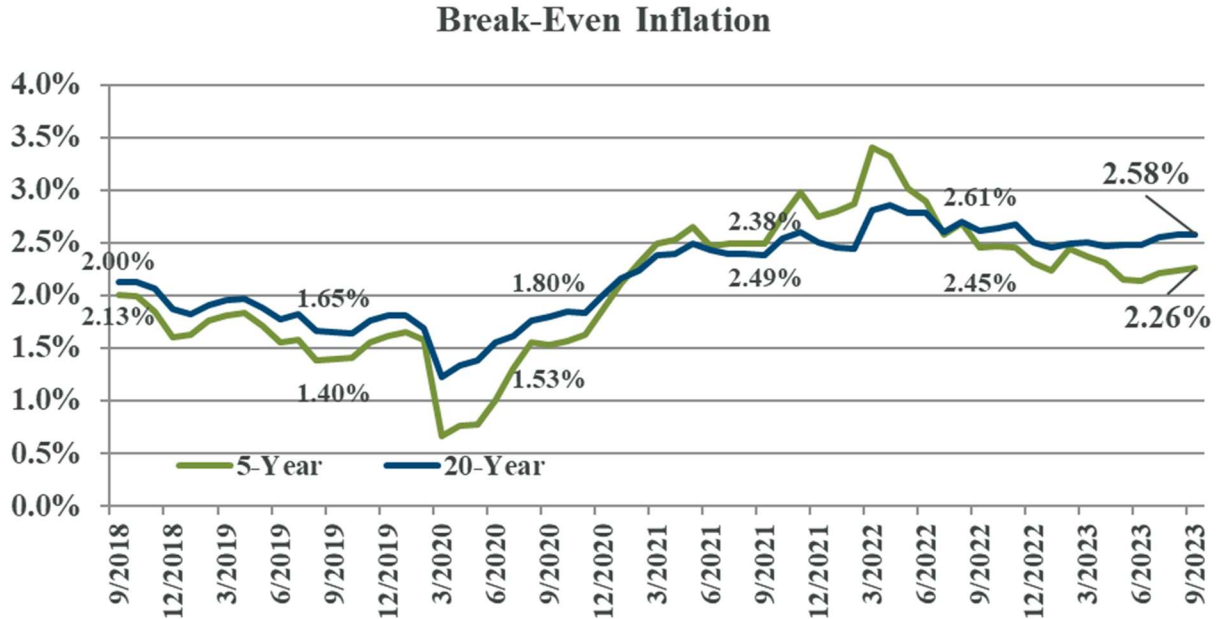
Over the 70 years ending June 2023, the geometric average inflation rate for the U.S. has been about 3.9%, but this average is heavily influenced by the high inflation rates in the 1970s and early 1980s. Over the last 30 years, the geometric average inflation rate has been 2.5%, and 2.7% over the last 10 years. The inflation rate for the Bay Area – which affects post-retirement COLAs and active member wage increases, but not necessarily overall investment returns – has generally tracked U.S. inflation reasonably closely but has been somewhat higher over the past 20 years (average of 2.8% vs. 2.6%).

### Future Expectations

A measure of the market consensus of expected future inflation rates is the difference in yields between conventional treasury bonds and Treasury Inflation-Protected Securities (TIPS) at the same maturity. Chart II-2 shows the yields on both types of bonds and the break-even inflation from July 2018 through July 2023 for five-year and 20-year durations. 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.

**SECTION II – ECONOMIC ASSUMPTIONS**  
**PRICE INFLATION**

**Chart II-2**



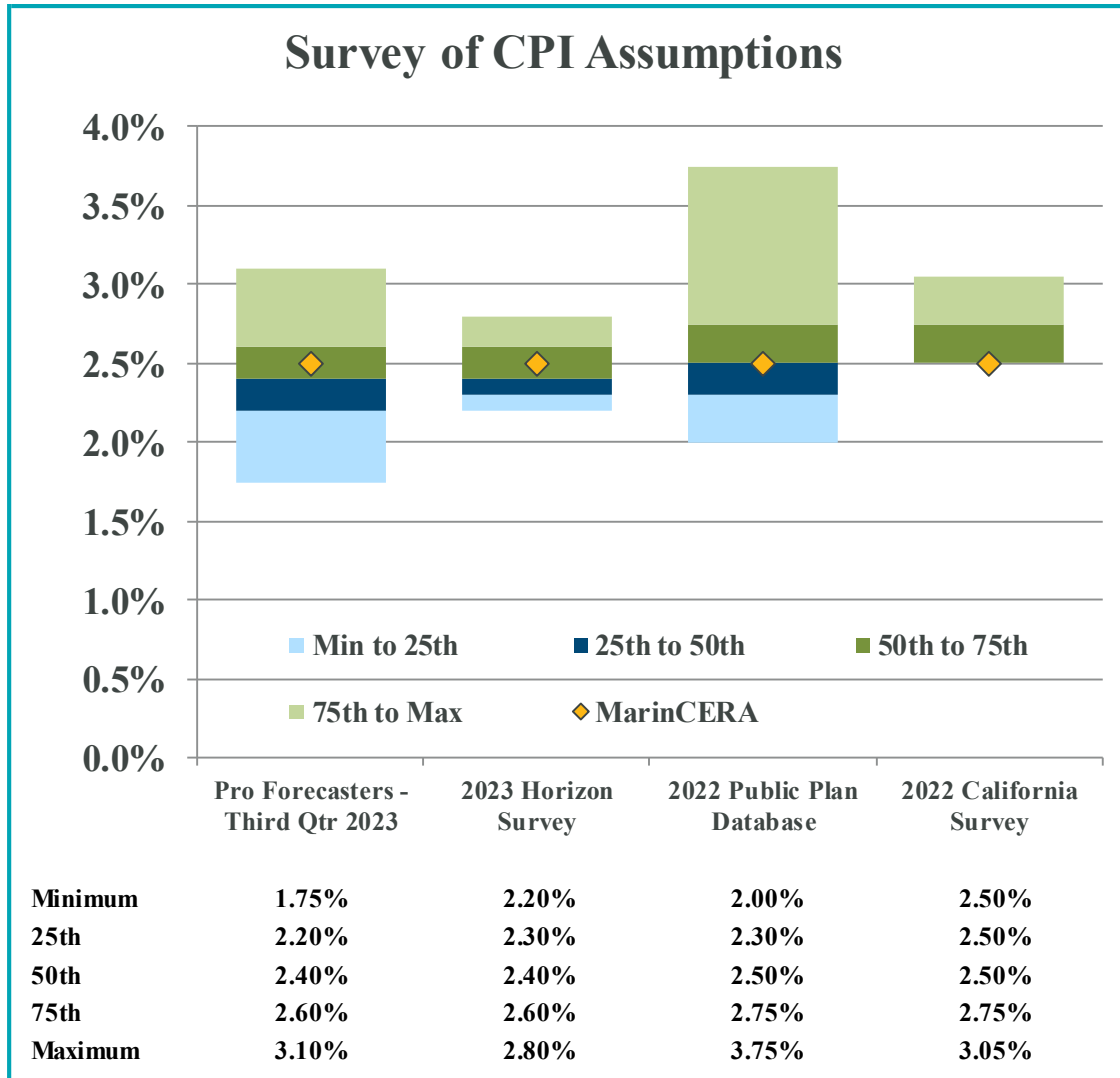
Data Source Federal Reserve, Constant Maturity Yields, Monthly Series

The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters. Chart II-3 on the next page shows the distribution of the professionals' forecasts for average inflation over the next 10 years, compared to a survey of investment consultants performed by Horizon Actuarial Services, as well as a database of assumptions used by U.S. public pension plans and a Cheiron survey of assumptions used by California public pension plans.



**SECTION II – ECONOMIC ASSUMPTIONS**  
**PRICE INFLATION**

**Chart II-3**



Finally, Callan, the Board's investment consultant, uses a 10-year inflation assumption of 2.50%, similar to that of many other investment consultants.

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 2.25% and 2.75%, and we recommend that the Board retain the current inflation assumption of 2.50%.

**SECTION II – ECONOMIC ASSUMPTIONS**  
**WAGE INFLATION**

**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.

From 2012 through 2022, wage inflation for Marin local government workers averaged approximately 4.0% compared to annual US price inflation of 2.6% and Bay area inflation of 3.2%. However, the average MCERA active member wage increased by only 2.3% per year over this period. The Social Security Administration projects real wage growth of 0.6% – 1.8% going forward in their Social Security solvency projections.

We believe that the small real wage growth assumption of 0.50% annually currently used by MCERA remains reasonable. If the Board retains the current price inflation assumption of 2.50%, we recommend that the Board continue using the real wage growth assumption of 0.50%, retaining a 3.00% total wage growth assumption.

## **SECTION II – ECONOMIC ASSUMPTIONS**

### **PAYROLL GROWTH**

### **PAYROLL GROWTH**

Under the funding policy for MCERA, the amortization payments to fund the layers of the unfunded liability are designed to increase each year. The rate of growth in these payments (notwithstanding the phasing in and out of new layers) is intended to be a constant or declining percentage of pensionable compensation.

In order to achieve this objective, an assumption regarding the rate of growth in overall pensionable compensation must be set. The dollar amount of the UAL payments will then be calculated to increase at this assumed rate of payroll growth. If actual payroll growth ends up being higher than the assumption, the UAL payments will decline as a percentage of pay, and if actual payroll growth is lower, the UAL rates will increase.

Traditionally for MCERA and most other public systems using level percentage of payroll methods, the assumed rate of payroll growth has been set equal to the wage growth assumption. This is consistent with an assumption that the pay for newly hired members will increase by the wage growth assumption each year, and that the Plan will have a stable active population – i.e., having a consistent number of active members and a stable distribution at various age and service levels – and that the increases in members' pay will be pensionable.

However, there are several reasons why it may be reasonable to set a payroll/amortization growth rate lower than the wage growth assumption. As a result of the Public Employee Pension Reform Act (PEPRA), some pay amounts for new hires will not be pensionable, both because of the changes in the definition of pensionable compensation and the impact of the PEPRA wage cap. This means that even if overall wages grow by the full wage growth assumption, the amount of wages that are pensionable are likely to grow by a smaller rate. In addition, budgetary stresses could cause payroll to increase less than expected. Finally, setting the amortization growth rate below the wage growth assumption increases the likelihood that UAL payments will decline rather than grow as a percentage of pay.

For these reasons, we recommend continuing the practice of setting the payroll/amortization growth assumption 0.25% less than the wage growth assumption. Retaining the 3.00% wage growth assumption as recommended results in a payroll/amortization growth rate of 2.75%.

## SECTION II – ECONOMIC ASSUMPTIONS COLA GROWTH

### COLA GROWTH

Most MCERA annuitants are eligible to receive automatic Cost-of-Living Adjustments (COLAs), based on the growth in the Bay Area Consumer Price Index (CPI-U) and reflecting various caps on the annual COLA increase. These caps depend on the Tier of the member, and can be 2%, 3% or 4% annually. 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.

Using an internally developed model, we have previously produced statistical simulations of inflation and then modeled how the COLA maxima 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.

Given we are not making any changes to our recommendation to the inflation assumption, we do not believe any changes to the assumptions previously recommended for the COLA growth assumptions are warranted *for future retirees*. The assumptions we recommend be retained for the 2%, 3%, and 4% COLA cap groups are 1.90%, 2.40% and 2.50%, respectively. The simulations results referenced above were developed using our proprietary simulation tool for assessing average annual COLA growth under different scenarios. We have relied on Cheiron colleagues who developed the tool, and we have used the tool in accordance with its purpose.

Given the recent significant increases in the COLA banks for members who are in pay status, we are valuing those banks directly in the liability calculations. For example, members with a 3% COLA cap who retired between January 1, 1985 and March 31, 2023 had a 2.5% COLA bank as of June 30, 2023.

Based on a 2.50% inflation assumption, these members are assumed to receive the maximum 3% COLA for the next five years, which would draw down their bank by 0.50% per year if inflation is 2.50%. After five years, these employees would be assumed to receive the same 2.40% COLA increases per year as the future retirees. We do not consider this approach to valuing the COLA banks to be an assumption change, but rather a clarification of how the existing COLA banks should be valued in the Plan's liability calculations, and that changes in the COLA banks are treated as a liability gain or loss for experience purposes.

## SECTION II – ECONOMIC ASSUMPTIONS DISCOUNT RATE

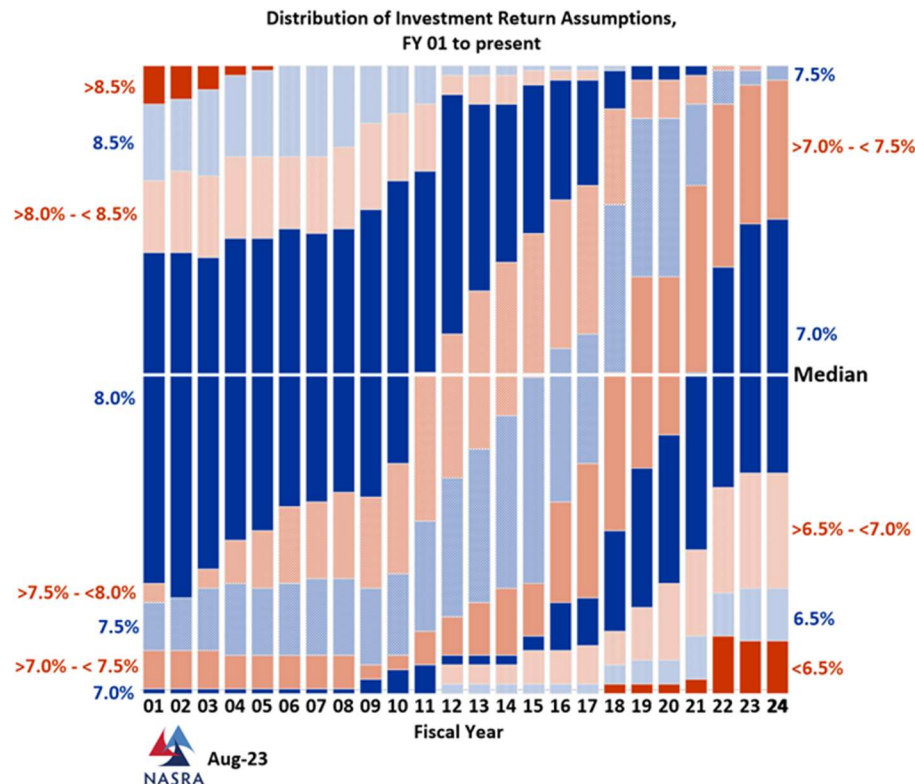
### DISCOUNT RATE

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 significantly 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-4 below shows the change in the distribution of assumptions since 2001. The median assumption is now 7.0% and the number of plans using a discount rate of 7.0% or lower has increased significantly.

Chart II-4

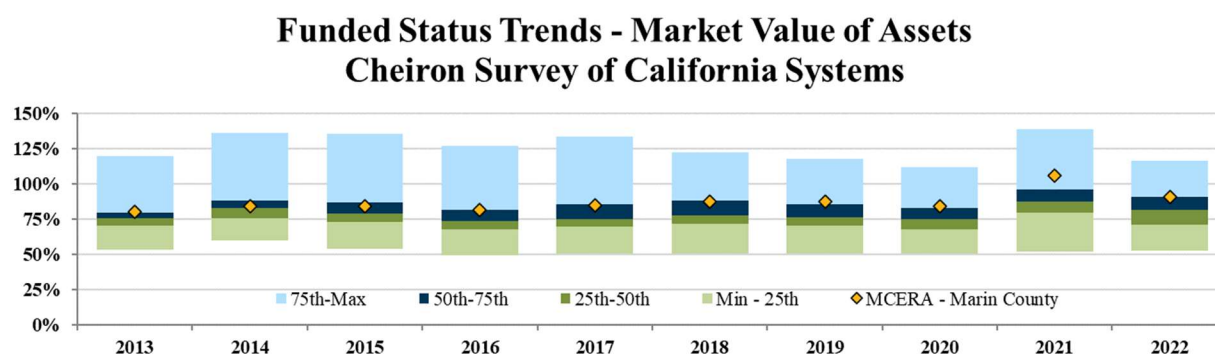


## SECTION II – ECONOMIC ASSUMPTIONS

### DISCOUNT RATE

Cheiron's survey of California public retirement systems shows a median assumption of 6.75%. In the survey prepared by Cheiron, 17 of the 39 systems surveyed used a discount rate assumption of 6.75% in their 2022 actuarial valuation, while 10 systems used a discount rate assumption of 7.00%. Chart II-5 below shows the change in discount rate assumptions for California systems from 2013 to 2022, with a gold marker showing the Plan's discount rate assumption over this period.

Chart II-5



### Target Asset Allocation and Future Expectations

The nominal expected return on assets depends on the allocation of assets to different asset classes (e.g., stocks, bonds, etc.) and the capital market assumptions for each of the asset classes.

Table II-2 on the next page shows the expected nominal geometric return based on the Board's current target asset allocation and the capital market assumptions (CMAs) provided by the Plan's investment consultant (Callan), as well as an average set of capital market assumptions based on a survey of multiple investment consultants published by Horizon Actuarial Services. For both sets of assumptions, we show the results from both the 2022 and 2023 expectations, given the extreme volatility of the markets, inflation, and interest rates over the past 24 months.

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). These results were produced using an internally developed model, which relies on asset class returns, standard deviations, and correlations provided by Callan and Horizon Actuarial Services, and which reflects an assumption that asset class returns are lognormally distributed.

**SECTION II – ECONOMIC ASSUMPTIONS**  
**DISCOUNT RATE**

**Table II-2**

<b>MCERA Portfolio Return Expectations</b> (reflects 5bp adjustment for investment expenses)				
<b>Consultant</b>	<b>Nominal</b>	<b>Inflation</b>	<b>Real</b>	<b>Standard Deviation</b>
<b>Callan (10-year, 2022)</b>	5.90%	2.25%	3.65%	12.99%
<b>Callan (10-year, 2023)</b>	<u>7.20%</u>	<u>2.50%</u>	<u>4.70%</u>	<u>13.20%</u>
<b>Callan 10-year average 2022-23</b>	6.55%	2.38%	4.18%	13.09%
<b>Horizon (Survey, 10-year, 2022)</b>	6.04%	2.47%	3.57%	12.41%
<b>Horizon (Survey, 10-year, 2023)</b>	<u>7.17%</u>	<u>2.56%</u>	<u>4.61%</u>	<u>12.53%</u>
<b>Horizon 10-year average 2022-23</b>	6.60%	2.52%	4.09%	12.47%
<b>Horizon (Survey, 20-year, 2022)</b>	6.71%	2.45%	4.26%	12.41%
<b>Horizon (Survey, 20-year, 2023)</b>	<u>7.49%</u>	<u>2.47%</u>	<u>5.02%</u>	<u>12.53%</u>
<b>Horizon 20-year average 2022-23</b>	7.10%	2.46%	4.64%	12.47%
<b>Overall Average</b>	6.75%	2.45%	4.30%	12.68%
<b>Current Assumption</b>	6.75%	2.50%	4.25%	

We note that the returns in Table II-2 above were reduced by 0.05% to reflect passive investment fees on the MCERA portfolio. The public asset class returns provided by the investment consultants are based on the expected returns of the portfolio benchmark indices, whereas the private asset class expected returns provided are net of fees. 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 active asset managers. However, a slight margin is appropriate to reflect the cost of investing in passively managed public classes, as well as investment-related expenses other than those of the investment managers, which would include the investment advisor and custodian.

Based on these capital market assumptions, as adjusted for investment expenses as discussed above, we also calculated the potential distribution of nominal returns over 10-year and 20-year periods (as applicable), as shown in Table II-3 on the next page. These results were determined based on the same internally developed model, using the 2023 CMAs.

**SECTION II – ECONOMIC ASSUMPTIONS**  
**DISCOUNT RATE**

**Table II-3**

<b>Expected Distribution of Average Nominal Annual Investment Returns</b> (2023 capital market assumptions, reflects 5bp adjustment for investment expenses)			
<b>Percentile</b>	<b>Callan (10-Year)</b>	<b>Horizon (10-Year)</b>	<b>Horizon (20-Year)</b>
<b>95th</b>	14.0%	13.8%	12.1%
<b>75th</b>	9.8%	9.8%	9.4%
<b>60th</b>	8.0%	8.2%	8.2%
<b>50th</b>	7.0%	7.2%	7.5%
<b>40th</b>	5.9%	6.2%	6.8%
<b>25th</b>	4.3%	4.6%	5.6%
<b>5th</b>	0.4%	0.9%	3.0%

Finally, we calculated the likelihood of achieving various nominal and real return thresholds, using the same model as described above, with the results shown in Table II-4 below. We note that for the purposes of this analysis, we used the applicable constant inflation assumption from the assumption set to estimate the real return from the simulated nominal returns. This practice may result in inaccurate estimates to the extent that the real returns by asset class are not independent of inflation.

**Table II-4**

<b>Likelihood of Achieving Average Returns</b> (reflects 5bp adjustment for investment expenses)			
	<b>6.50%</b>	<b>6.75%</b>	<b>7.00%</b>
<b>Callan (10-yr), 2022</b>	44%	42%	39%
<b>Callan (10-yr), 2023</b>	55%	52%	50%
<b>Horizon (10-yr), 2022</b>	45%	43%	40%
<b>Horizon (10-yr), 2023</b>	57%	54%	52%
<b>Horizon (20-yr), 2022</b>	53%	49%	46%
<b>Horizon (20-yr), 2023</b>	64%	60%	57%
<b>Average (2022)</b>	47%	45%	42%
<b>Average (2023)</b>	59%	55%	53%
<b>Average (2022-2023)</b>	53%	50%	47%

As shown in Table II-2, we calculated an average expected geometric real return of 4.30% across all assumption sets, which is slightly above the Board's current real return assumption of 4.25%. The average nominal return of 6.75% is the same as the current nominal return assumption of 6.75%. We recommend that the Board retain the current real return assumption of 4.25% and the nominal return assumption of 6.75%. We note that other sets of assumptions are also reasonable.



### **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 MCERA, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where MCERA experience is not fully credible and a standard table is available. For purposes of this study, merit salary increases and administrative expenses are also considered demographic assumptions because the assumptions are based primarily on MCERA's historical experience.

#### **MERIT SALARY INCREASES**

Salary increases consist of three components: increases due to cost-of-living maintenance (inflation), increases related to pressures above inflation 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 base pay factors not related to inflation 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 longevity increase or receive a promotion, so their salary increases tend to be greater than those for longer service employees. A *longitudinal* approach was used to analyze the merit increases for this study.

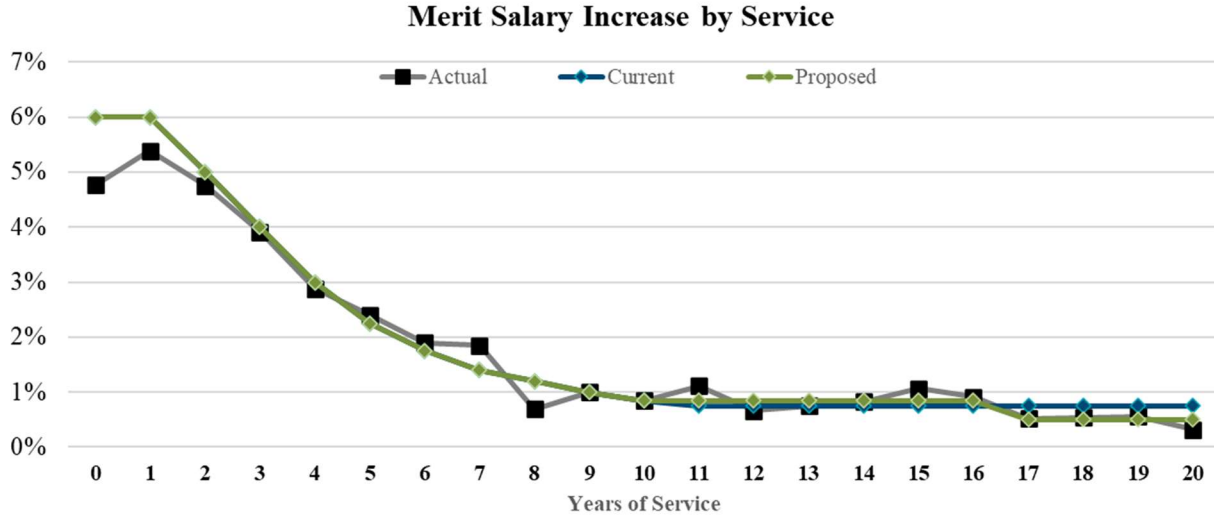
A longitudinal study reviews the average increase in pay for each level of service. To analyze the merit component, we subtracted the Plan's wage growth – as measured by the annual increase in average valuation salary during the experience study period – from the total pay increases experienced by each member during the experience study period.

Charts III-1 and III-2 on the following pages illustrate the results of the longitudinal study. It analyzes the pay patterns for Miscellaneous and Safety members, respectively. Our charts will generally show the current assumption (blue line) compared to the actual experience (gray line) and the proposed assumption (green line). When no change in assumption is proposed, the current assumption will not appear on the chart. We backed out the wage growth in order to isolate the merit, promotion, and longevity component. 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.

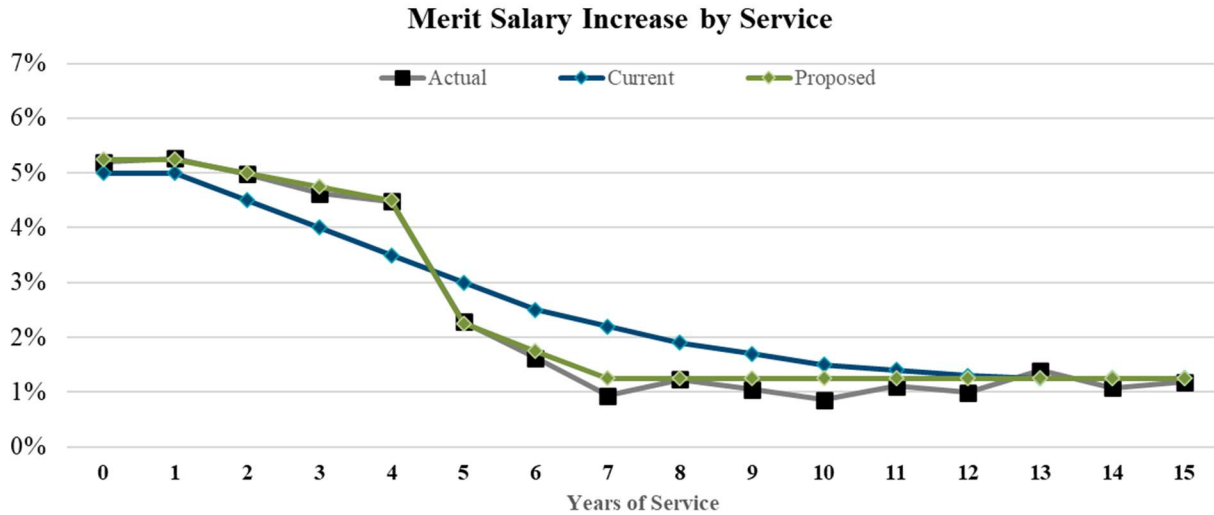
We recommend slightly higher rates for Miscellaneous for 11 to 16 years of service and slightly lower rates for 17 or more years of service. We recommend higher rates for Safety for 0 to four years of service and lower rates for 5 to 12 years of service.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**MERIT SALARY INCREASES**

**Chart III-1: Miscellaneous**



**Chart III-2: Safety**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS

#### ANALYSIS OF OTHER DEMOGRAPHIC ASSUMPTIONS

For most 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.

In addition, we calculated the 90% confidence interval using a binomial distribution, which represents the range within which the true decrement rate during the experience study period fell with 90% confidence. 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, to account for the past experience represented by the current assumption, and to maintain a neutral to slight conservative bias in the selection of the assumption. For disability, mortality, and some retirement rates, we compare MCERA's experience to that of a published table and adjust the tables to bring the proposed assumption closer to an A/E ratio of 100% taking into account the level and credibility of MCERA's experience.

Our internal model uses the limited fluctuation approach to credibility assigning full credibility when there is a 90% probability that MCERA's sample experience rate will be within 5% of the true expected rate. For assumptions where the expected rate is near zero, this approach requires 1082 actual decrements for full credibility. When there is insufficient experience for full credibility, partial credibility is assigned, weighting MCERA's experience by the square root of the ratio of actual decrements in the sample to the number of decrements required for full credibility. The remaining weight is given to the published table. Other methods of determining credibility may produce a different result.

To track how well the assumption fits the pattern of the data, we calculate the percentage of the assumptions that fall within the 90% confidence interval, and we calculate an r-squared statistic for each assumption. R-squared can be thought of as the percentage of the variation in actual data explained by the assumption. Ideally, all of the assumptions would fall within the 90% confidence interval and r-squared would equal 100% although this is never the case. Any proposed assumption change should increase the percentage of assumptions within the confidence interval and should increase the r-squared compared to the current assumption making it closer to 100% unless the pattern of future decrements is expected to be different from the pattern experienced during the period of study.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**RETIREMENT RATES**

**RETIREMENT RATES**

The current retirement rates vary by group, age, and service and are applied to all members who are eligible to retire. We have combined the experience of the past three years with that of the prior two three-year periods in order to have a more robust dataset (nine years in total) to review. We also reviewed the experience for just the most recent three years (2020-2023), as well as excluding the “COVID Period” (2020-2022) and found that the proposed assumptions were still reasonable across all periods.

Generally, at any given age, members with more service are more likely to retire than members with fewer years of service. We reviewed the MCERA actual retirement rates based on service groupings since MCERA is not large enough to justify assumptions for each age and service combination.

We recommend maintaining the current assumptions for Classic Miscellaneous members. We suggest increasing some rates for those Safety members with the 3% at age 50 benefit formula with 30 or more years of service and adjustments to the current assumptions for Safety members with the 3% at age 55 benefit formulas at all levels of service.

We recommend replacing the assumptions for all Miscellaneous PEPRAs with the same rates as those for Classic Miscellaneous members beginning at age 52, extending rates to apply to those with between five and ten years of service to cover PEPRAs' earlier eligibility. We are not proposing any changes to the Safety PEPRAs member retirement assumptions.

### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

Table III-R1 shows the calculation of actual-to-expected ratios and the r-squared statistic for Miscellaneous Classic members with less than 20 years of service. Chart III-R1 shows the information graphically along with the 90% confidence interval.

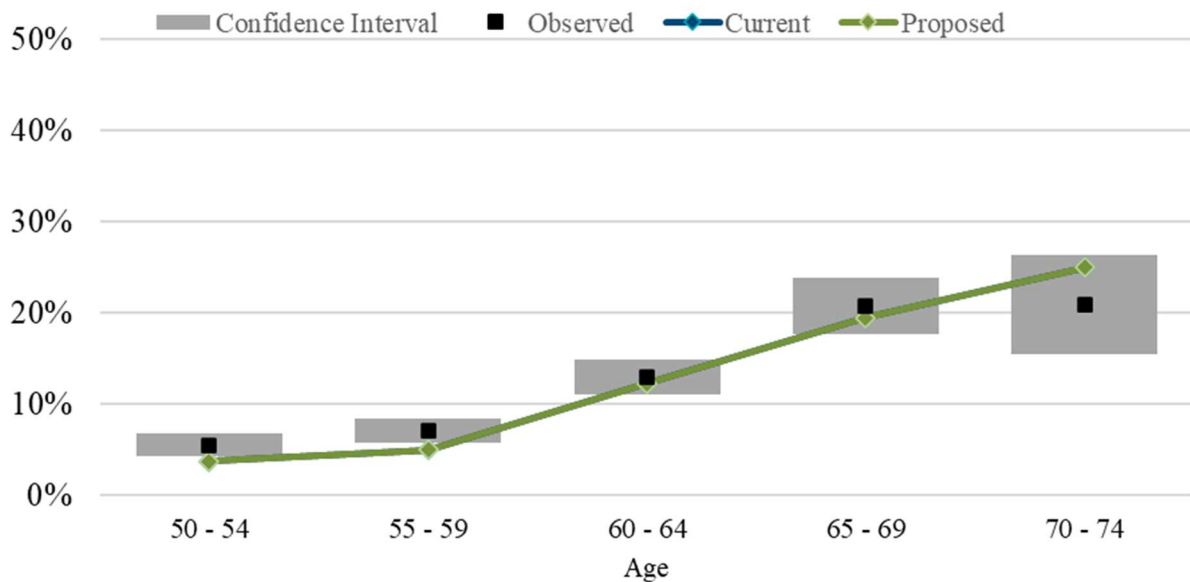
The data shows slightly higher actual retirement rates than expected under the current assumption. We are not suggesting any changes at this time. The A/E ratio was 113% over the last 9 years, and the r-squared statistic is 85%.

**Table III-R1**

Miscellaneous Classic Retirement Rates for 10 to 19 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50 - 54	942	52	36	36	5.5%	3.8%	3.8%	145%	145%
55 - 59	974	69	49	49	7.1%	5.0%	5.0%	142%	142%
60 - 64	841	109	103	103	13.0%	12.3%	12.3%	106%	106%
65 - 69	490	102	95	95	20.8%	19.5%	19.5%	107%	107%
70 - 74	148	31	37	37	20.9%	25.0%	25.0%	84%	84%
<b>TOTAL</b>	<b>3,395</b>	<b>363</b>	<b>320</b>	<b>320</b>	<b>10.7%</b>	<b>9.4%</b>	<b>9.4%</b>	<b>113%</b>	<b>113%</b>
<b>Confidence Interval %</b>			<b>73%</b>	<b>73%</b>					
<b>R-squared</b>			<b>85%</b>	<b>85%</b>					

**Chart III-R1**

#### Miscellaneous Classic Retirement Rates for 10 to 19 Years of Service



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

Table III-R2 shows the calculation of actual-to-expected ratios and the r-squared statistic for Miscellaneous Classic members with 20 to 29 years of service. Chart III-R2 shows the information graphically along with the 90% confidence interval.

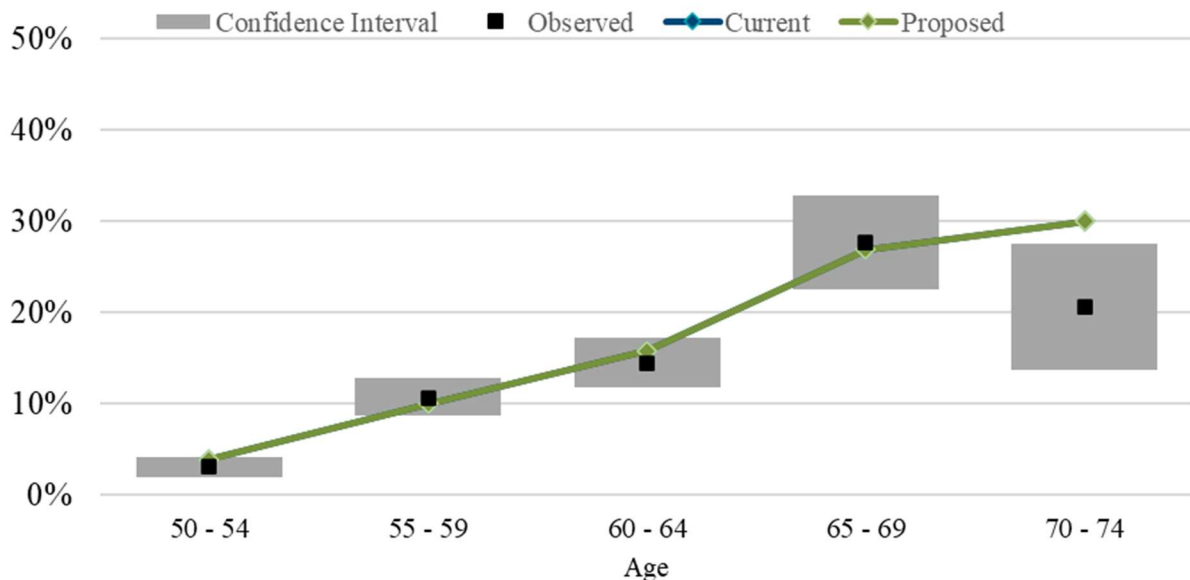
The data shows actual retirement rates close to those expected under the current assumption. No assumption changes are recommended for these members.

**Table III-R2**

Miscellaneous Classic Retirement Rates for 20 to 29 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50 - 54	618	19	24	24	3.1%	3.9%	3.9%	79%	79%
55 - 59	608	65	61	61	10.7%	10.0%	10.0%	107%	107%
60 - 64	489	71	77	77	14.5%	15.8%	15.8%	92%	92%
65 - 69	213	59	57	57	27.7%	26.9%	26.9%	103%	103%
70 - 74	87	18	26	26	20.7%	30.0%	30.0%	69%	69%
<b>TOTAL</b>	<b>2,015</b>	<b>232</b>	<b>245</b>	<b>245</b>	<b>11.5%</b>	<b>12.2%</b>	<b>12.2%</b>	<b>95%</b>	<b>95%</b>
<b>Confidence Interval %</b>			<b>70%</b>	<b>70%</b>					
<b>R-squared</b>			<b>83%</b>	<b>83%</b>					

**Chart III-R2**

#### Miscellaneous Classic Retirement Rates for 20 to 29 Years of Service



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

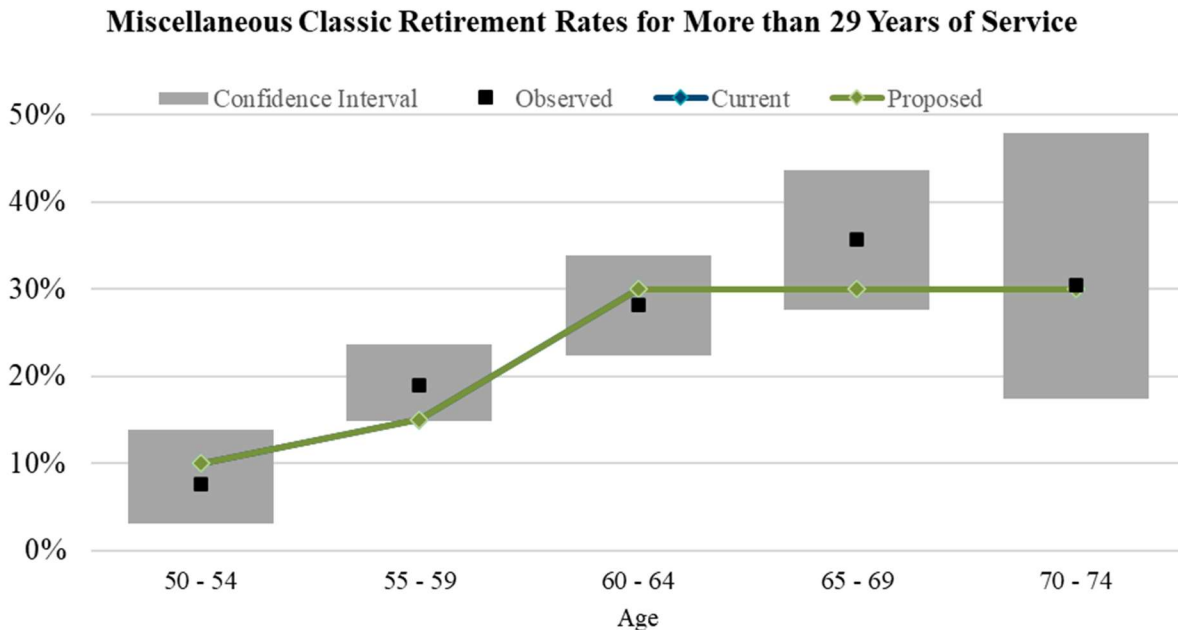
Table III-R3 shows the calculation of actual-to-expected ratios and the r-squared statistic for Miscellaneous Classic members with 30 or more years of service. Chart III-R3 shows the information graphically along with the 90% confidence interval.

The data shows actual retirement rates close to those expected under the current assumption. No assumption changes are recommended for these members.

**Table III-R3**

Miscellaneous Retirement Rates for More than 29 Years of Service									
Age	Expos ures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50 - 54	65	5	6	6	7.7%	10.0%	10.0%	77%	77%
55 - 59	216	41	32	32	19.0%	15.0%	15.0%	127%	127%
60 - 64	174	49	52	52	28.2%	30.0%	30.0%	94%	94%
65 - 69	87	31	26	26	35.6%	30.0%	30.0%	119%	119%
70 - 74	23	7	7	7	30.4%	30.0%	30.0%	101%	101%
<b>TOTAL</b>	<b>565</b>	<b>133</b>	<b>124</b>	<b>124</b>	<b>23.5%</b>	<b>22.0%</b>	<b>22.0%</b>	<b>107%</b>	<b>107%</b>
Confidence Interval %			67%	67%					
R-squared			87%	87%					

**Chart III-R3**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

Table III-R4 shows the calculation of actual-to-expected ratios and the r-squared statistic for Miscellaneous PEPRA members with 5 to 19 years of service. Chart III-R4 shows the information graphically along with the 90% confidence interval.

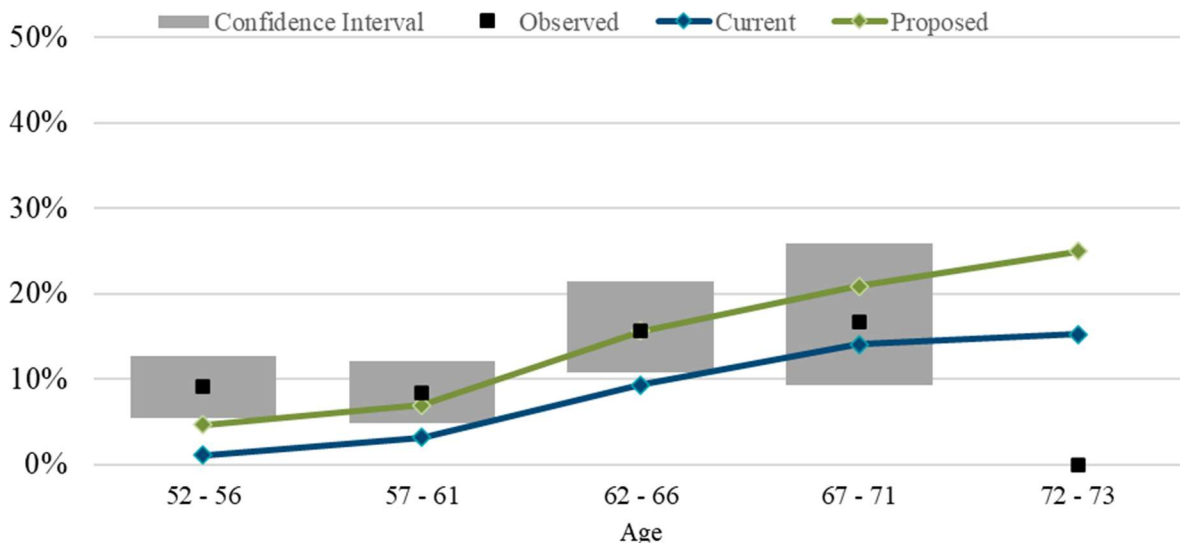
In the prior experience study, because we had very limited data on PEPRA member retirements, we recommended adopting the assumptions used by CalPERS to predict retirement rates for their PEPRA members. MCERA's recent experience indicates that retirement rates are higher than the current assumption and similar to the rates used for Classic members. Therefore, we recommend using the same retirement assumptions for the Classic and PEPRA members (though applying the rates beginning at age 52 with five years of service for the PEPRA members, consistent with eligibility requirements for PEPRA members).

**Table III-R4**

Miscellaneous PEPRA Retirement Rates for 5 to 19 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
52 - 56	165	15	2	8	9.1%	1.1%	4.6%	821%	196%
57 - 61	165	14	5	12	8.5%	3.2%	7.0%	264%	122%
62 - 66	121	19	11	19	15.7%	9.3%	15.7%	168%	100%
67 - 71	54	9	8	11	16.7%	14.1%	20.9%	119%	80%
72 - 73	2	0	0	1	0.0%	15.3%	25.0%	0%	0%
<b>TOTAL</b>	<b>507</b>	<b>57</b>	<b>26</b>	<b>50</b>	<b>11.2%</b>	<b>5.2%</b>	<b>9.8%</b>	<b>216%</b>	<b>114%</b>
Confidence Interval %			37%	53%					
R-squared			39%	55%					

**Chart III-R4**

#### Miscellaneous PEPRA Retirement Rates for 5 to 19 Years of Service





### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

See Appendices A and B for a full listing of the proposed and prior retirement rates for Miscellaneous members. The ultimate retirement age remains at 80.

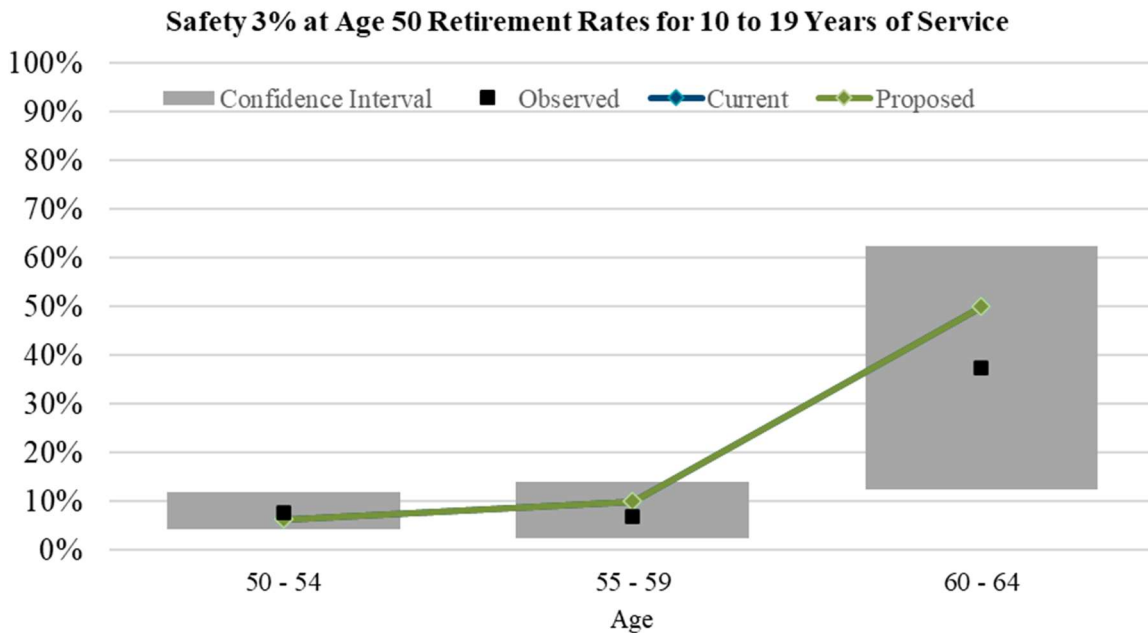
Table III-R5 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with the 3% at age 50 benefit formula and 10 to 19 years of service. Chart III-R5 shows the information graphically along with the 90% confidence interval.

The limited data shows actual retirement rates slightly lower than those expected under the current assumption, but the current assumptions remain within the confidence intervals. No assumption changes are recommended for these members.

**Table III-R5**

Safety 3% at Age 50 Retirement Rates for 10 to 19 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50 - 54	117	9	7	7	7.7%	6.4%	6.4%	121%	121%
55 - 59	43	3	4	4	7.0%	10.0%	10.0%	70%	70%
60 - 64	8	3	4.0	4.0	37.5%	50.0%	50.0%	75%	75%
<b>TOTAL</b>	<b>168</b>	<b>15</b>	<b>16</b>	<b>16</b>	<b>8.9%</b>	<b>9.4%</b>	<b>9.4%</b>	<b>95%</b>	<b>95%</b>
Confidence Interval %			30%	30%					
R-squared			86%	86%					

**Chart III-R5**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

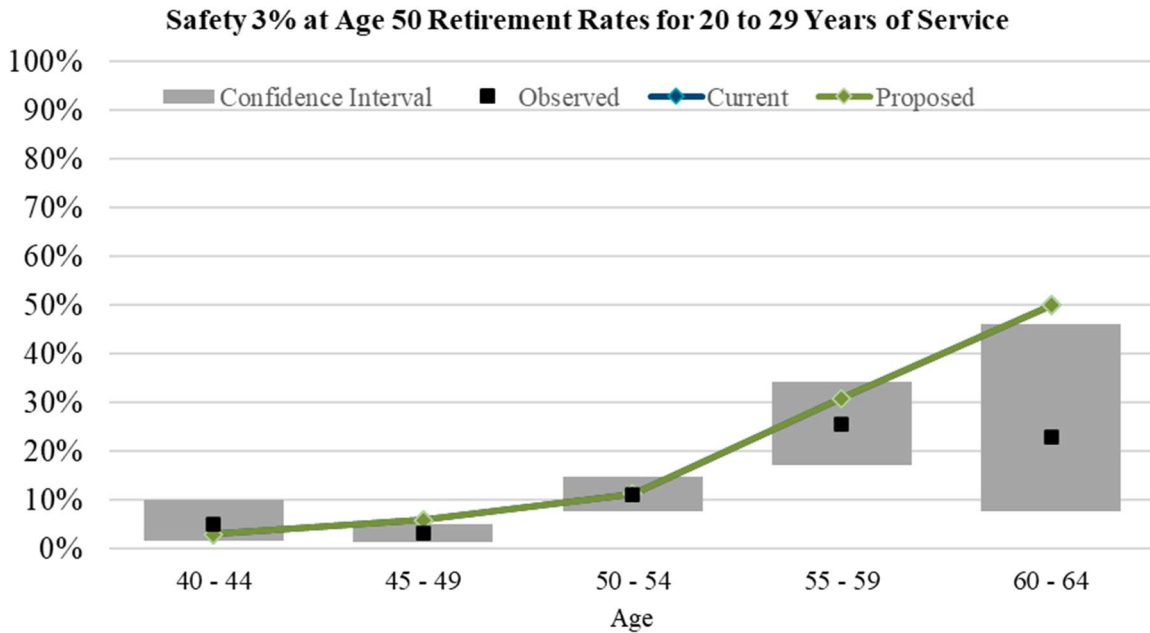
Table III-R6 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with the 3% at age 50 benefit formula and 20 to 29 years of service. Chart III-R6 shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption, but the current assumptions remain within or close to the confidence intervals. No assumption changes are recommended for these members.

**Table III-R6**

Safety 3% at Age 50 Retirement Rates for 20 to 29 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
40 - 44	60	3	2	2	5.0%	3.0%	3.0%	167%	167%
45 - 49	280	9	17	17	3.2%	6.0%	6.0%	54%	54%
50 - 54	223	25	25	25	11.2%	11.3%	11.3%	99%	99%
55 - 59	70	18	22	22	25.7%	30.9%	30.9%	83%	83%
60 - 64	13	3	6.5	6.5	23.1%	50.0%	50.0%	46%	46%
<b>TOTAL</b>	<b>646</b>	<b>58</b>	<b>72</b>	<b>72</b>	<b>9.0%</b>	<b>11.2%</b>	<b>11.2%</b>	<b>80%</b>	<b>80%</b>
Confidence Interval %			43%	43%					
R-squared			71%	71%					

**Chart III-R6**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

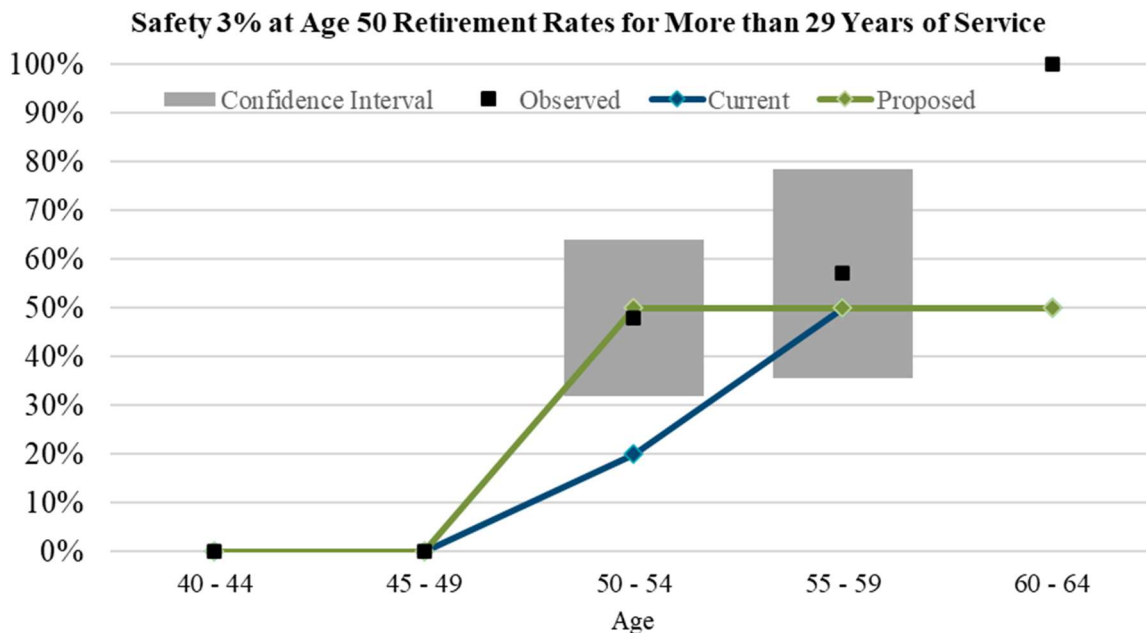
Table III-R7 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with the 3% at age 50 benefit formula and 30 or more years of service. Chart III-R7 shows the information graphically along with the 90% confidence interval.

The data shows actual retirement rates that are higher than expected in aggregate under the current assumption. We propose a change in assumptions to 50% for retirees younger than 65 with 30 or more years of service.

**Table III-R7 – Safety, 3% at age 50**

Safety 3% at Age 50 Retirement Rates for More than 29 Years of Service									
Age	Expos ures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
40 - 44	0	0	0	0	0.0%	0.0%	50.0%	0%	0%
45 - 49	0	0	0	0	0.0%	0.0%	50.0%	0%	0%
50 - 54	25	12	5	13	48.0%	20.0%	50.0%	240%	96%
55 - 59	14	8	7	7	57.1%	50.0%	50.0%	114%	114%
60 - 64	1	1	0.5	0.5	100.0%	50.0%	50.0%	200%	200%
<b>TOTAL</b>	<b>40</b>	<b>21</b>	<b>13</b>	<b>20</b>	<b>52.5%</b>	<b>31.3%</b>	<b>50.0%</b>	<b>168%</b>	<b>105%</b>
<b>Confidence Interval %</b>			<b>13%</b>	<b>20%</b>					
<b>R-squared</b>			<b>65%</b>	<b>85%</b>					

**Chart III-R7 – Safety, 3% at age 50**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

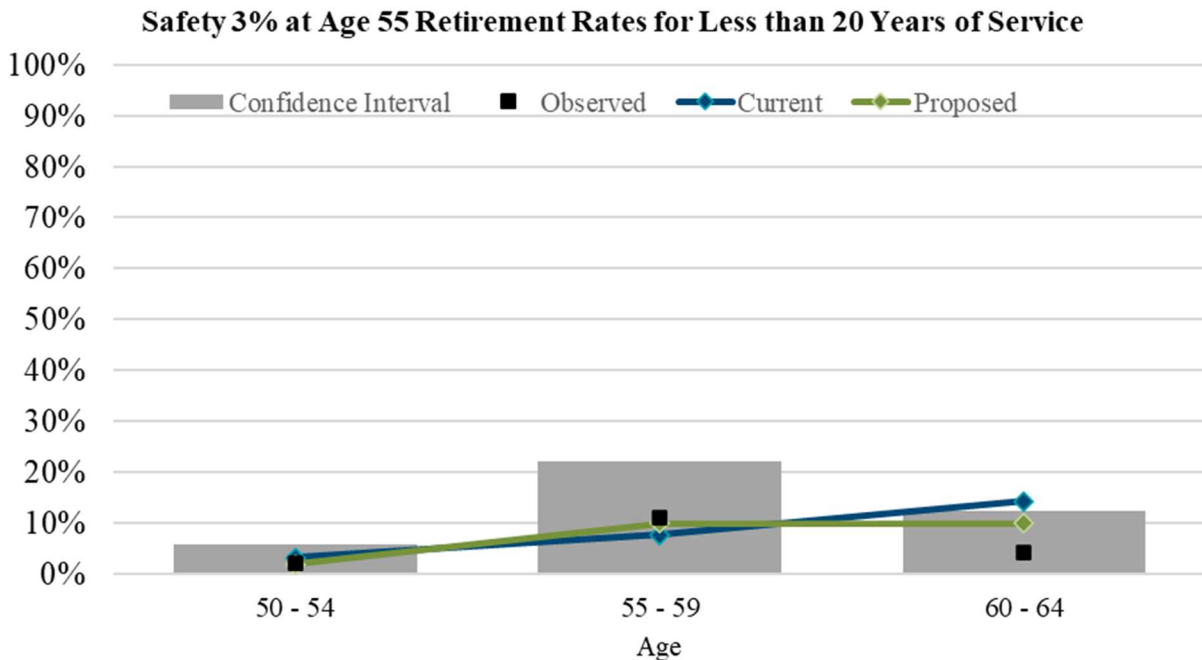
Table III-R8 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with the 3% at age 55 benefit formula and less than 20 years of service. Chart III-R8 shows the information graphically along with the 90% confidence interval.

The data shows lower actual retirement rates than expected under the current assumption. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 65% to 84%. The r-squared statistic remains low, but there is very little data available (only five actual retirements).

**Table III-R8**

Safety 3% at Age 55 Retirement Rates for Less than 20 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50 - 54	87	2	3	2	2.3%	3.3%	2.0%	69%	115%
55 - 59	18	2	1	2	11.1%	7.8%	10.0%	142%	111%
60 - 64	24	1	3.5	2.4	4.2%	14.4%	10.0%	29%	42%
<b>TOTAL</b>	<b>129</b>	<b>5</b>	<b>8</b>	<b>6</b>	<b>3.9%</b>	<b>6.0%</b>	<b>4.6%</b>	<b>65%</b>	<b>84%</b>
Confidence Interval %			13%	13%					
R-squared			3%	2%					

**Chart III-R8**



**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**RETIREMENT RATES**

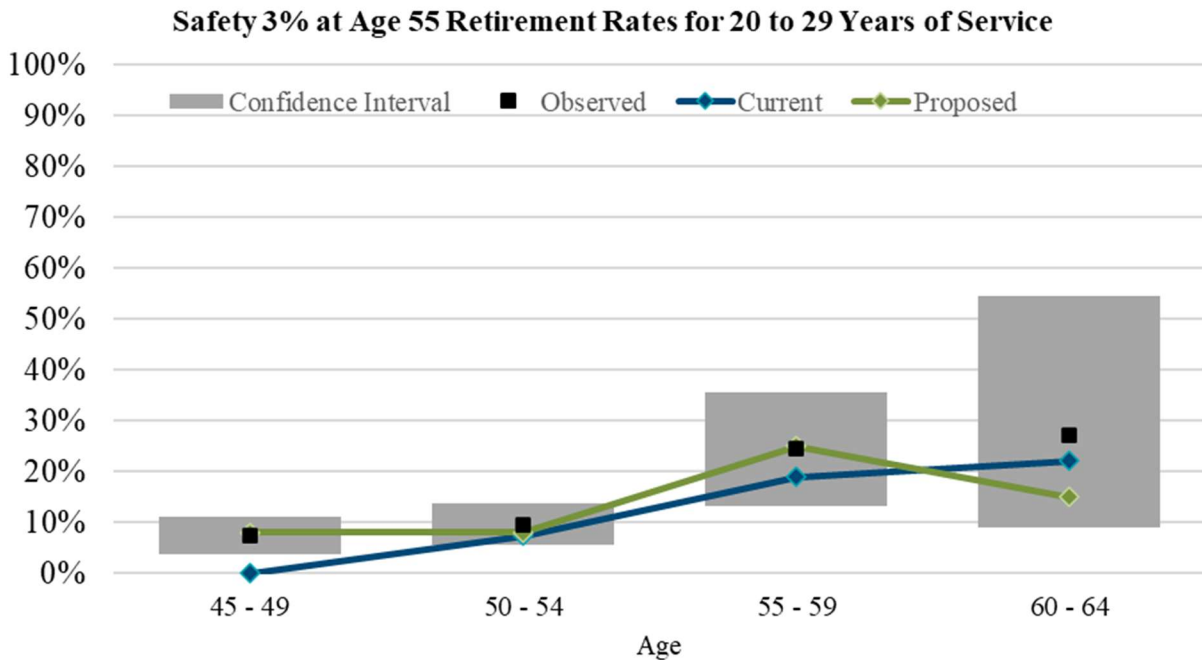
Table III-R9 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with the 3% at age 55 benefit formula with 20 to 29 years of service. Chart III-R9 shows the information graphically along with the 90% confidence interval.

The data shows higher actual retirement rates than expected under the current assumption. The proposed assumption increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio from 174% to 107%. The r-squared statistic increases from 47% to 70%.

**Table III-R9**

Safety 3% at Age 55 Retirement Rates for 20 to 29 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
45 - 49	135	10	0	11	7.4%	0.0%	8.0%	0%	93%
50 - 54	146	14	11	12	9.6%	7.4%	8.0%	129%	120%
55 - 59	45	11	9	11	24.4%	19.0%	25.0%	129%	98%
60 - 64	11	3	2.4	1.7	27.3%	22.2%	15.0%	123%	182%
<b>TOTAL</b>	<b>337</b>	<b>38</b>	<b>22</b>	<b>35</b>	<b>11.3%</b>	<b>6.5%</b>	<b>10.5%</b>	<b>174%</b>	<b>107%</b>
Confidence Interval %			40%	43%					
R-squared			47%	70%					

**Chart III-R9**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS RETIREMENT RATES

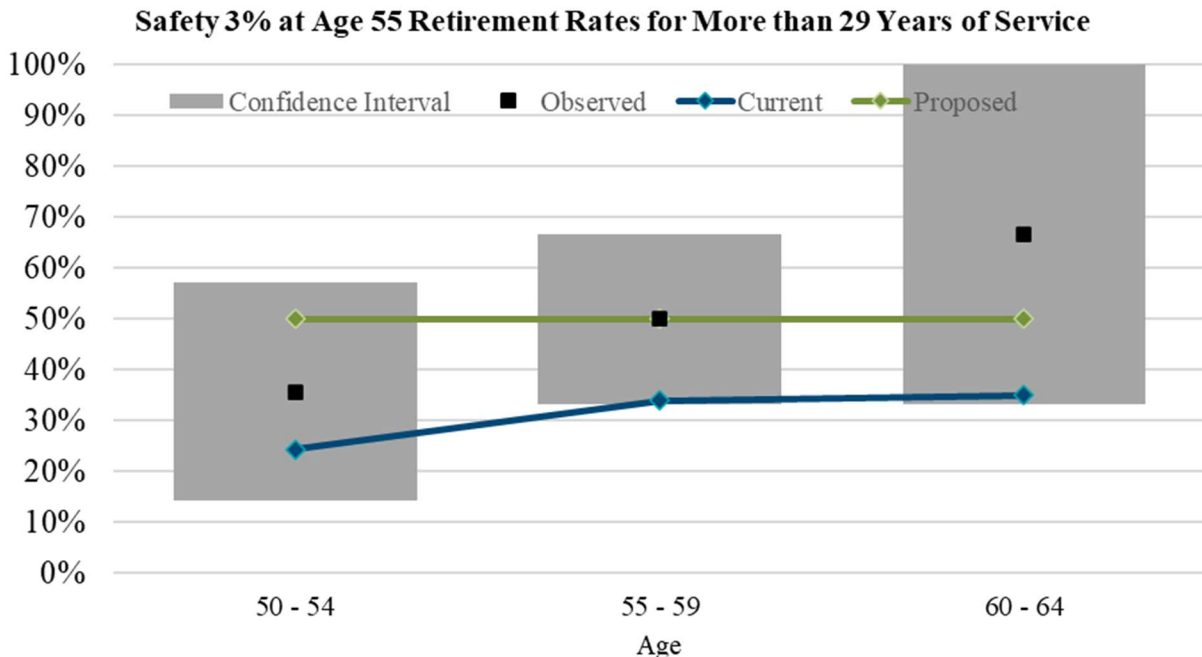
Table III-R10 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members with the 3% at age 55 benefit formula and 30 or more years of service. Chart III-R10 shows the information graphically along with the 90% confidence interval.

The data shows higher actual retirement rates than expected under the current assumption. The proposed assumption increases the aggregate assumed rates of retirement and decreases the aggregate A/E ratio from 151% to 91%. The r-squared statistic decreases slightly from 75% to 74%.

**Table III-R10**

Safety 3% at Age 55 Retirement Rates for More than 29 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
50 - 54	14	5	3	7	35.7%	24.4%	50.0%	147%	71%
55 - 59	18	9	6	9	50.0%	33.9%	50.0%	147%	100%
60 - 64	3	2	1.1	1.5	66.7%	35.0%	50.0%	190%	133%
<b>TOTAL</b>	<b>35</b>	<b>16</b>	<b>11</b>	<b>18</b>	<b>45.7%</b>	<b>30.2%</b>	<b>50.0%</b>	<b>151%</b>	<b>91%</b>
<b>Confidence Interval %</b>			<b>23%</b>	<b>23%</b>					
<b>R-squared</b>			<b>75%</b>	<b>74%</b>					

**Chart III-R10**



**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**TERMINATION RATES**

**TERMINATION RATES**

Termination rates reflect the frequency at which active members leave employment for reasons other than retirement, death, or disability. Currently, Miscellaneous termination rates are based on service while Safety member termination rates are based on both age and service. The termination rates do not apply once members are eligible for a service retirement benefit.

To make the best use of the available member data, we study all terminations together – vested terminations, terminating members who withdraw their contributions, and members who transfer to a reciprocal pension plan – to determine an overall termination rate. We then analyze the percentages of terminating members who withdraw their contributions, transfer, or are eligible for a vested benefit. Additionally, we have combined the experience of the past three years with that of the prior two three-year periods in order to have a more robust dataset (nine years in total) to review.

Based on this data, we recommend replacing the current age and service-based termination rates for Safety members with service-only rates. We are not recommending any changes to termination rates for Miscellaneous members.

### SECTION III – DEMOGRAPHIC ASSUMPTIONS TERMINATION RATES

Table III-T1 shows the calculation of actual-to-expected ratios and the r-squared statistic for Miscellaneous members and Table III-T2 shows the same for Safety members. Charts III-T1 and III-T2 show the information graphically along with the 90% confidence intervals.

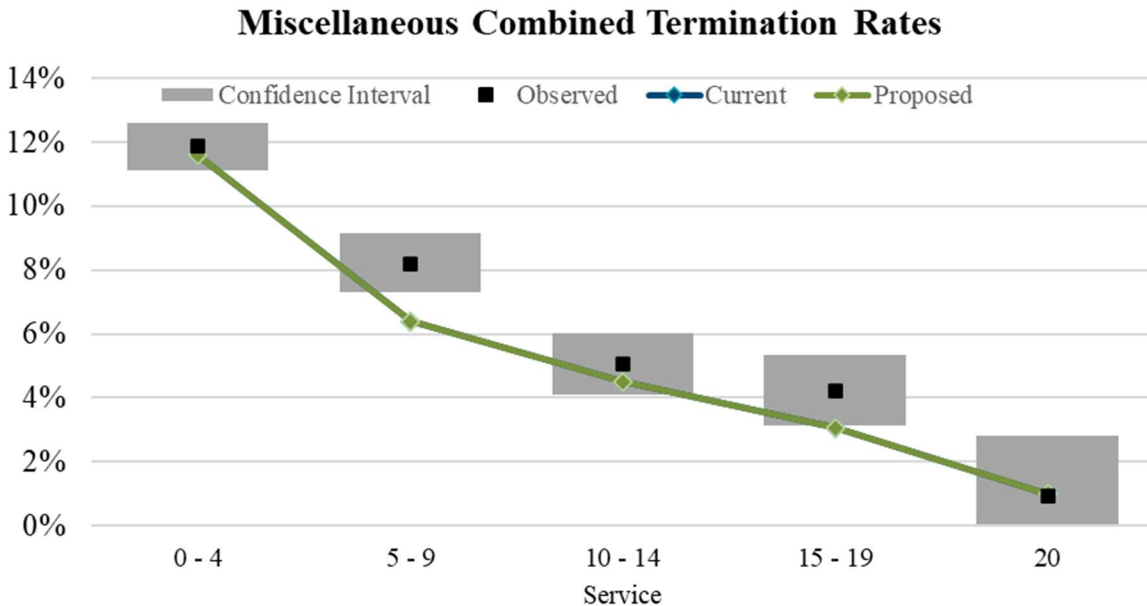
The data shows that in most cases the actual termination rates are slightly higher in aggregate, similar to the results in the last study.

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

**Table III-T1**

Miscellaneous Combined Termination Rates									
Service	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
0 - 4	5,167	613	599	599	11.9%	11.6%	11.6%	102%	102%
5 - 9	2,485	204	159	159	8.2%	6.4%	6.4%	128%	128%
10 - 14	1,462	74	66	66	5.1%	4.5%	4.5%	112%	112%
15 - 19	898	38	28	28	4.2%	3.1%	3.1%	138%	138%
20	107	1	1	1	0.9%	1.0%	1.0%	93%	93%
<b>TOTAL</b>	<b>10,119</b>	<b>930</b>	<b>853</b>	<b>853</b>	<b>9.2%</b>	<b>8.4%</b>	<b>8.4%</b>	<b>109%</b>	<b>109%</b>
Confidence Interval %			71%	71%					
R-squared			99%	99%					

**Chart III-T1**



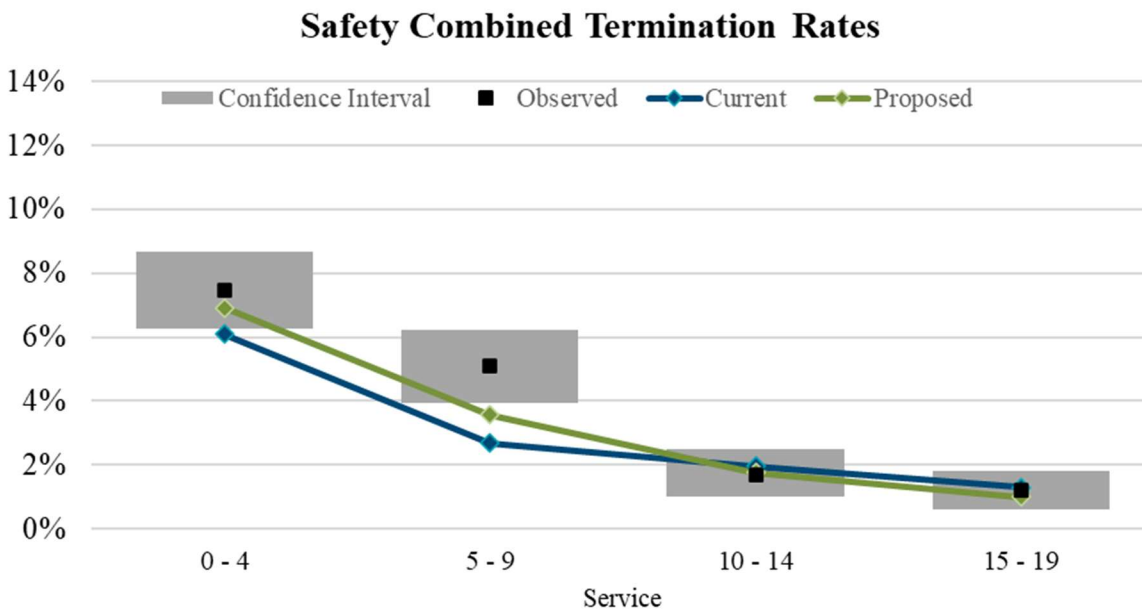


**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**TERMINATION RATES**

**Table III-T2 – Safety**

Safety Combined Termination Rates									
Service	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
0 - 4	1,339	100	82	93	7.5%	6.1%	6.9%	123%	108%
5 - 9	961	49	26	34	5.1%	2.7%	3.6%	190%	143%
10 - 14	880	15	17	16	1.7%	2.0%	1.8%	87%	97%
15 - 19	832	10	11	8	1.2%	1.3%	1.0%	92%	120%
<b>TOTAL</b>	<b>4,012</b>	<b>174</b>	<b>135</b>	<b>151</b>	<b>4.3%</b>	<b>3.4%</b>	<b>3.8%</b>	<b>128%</b>	<b>115%</b>
Confidence Interval %			80%	90%					
R-squared			86%	89%					

**Chart III-T2 – Safety**



**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**TERMINATION RATES**

**TYPES OF TERMINATION**

When a vested member terminates employment, the member has the option of receiving a refund of contributions with interest or a deferred annuity. If an employee terminates employment and works for a reciprocal employer (also referred to as a transfer), the employee's retirement benefit is based on the employee's service with MCERA and Final Compensation based on employment with the reciprocal employer.

Tables III-T3 and III-T4 show the results of our analysis of terminations for Safety and Miscellaneous members, as well as our recommendations regarding rates of withdrawal versus the entering deferred status (either vested terminations or transfers). The only modification we are recommending is to eliminate the likelihood of withdrawal for members with at least fifteen years of service, as there was only one Miscellaneous withdrawal and one Safety withdrawal among those with at least fifteen years of service in the past nine years.

In the previous study, we recommended an assumption that 85% of all Safety members who enter deferred status will establish reciprocity and 40% of all deferred Miscellaneous members will establish reciprocity. We reviewed the number of members who went from a deferred status to service retirement during the study period and determined which of those members had established reciprocity with another system prior to retirement.

For the most recent three years, we found that just over 40% of Miscellaneous members who retired from deferred status had been reported as having established reciprocity, and over 65% of Safety members had done so. However, we note that there may be some members who retire from a reciprocal status who were not identified as having reciprocity in the year prior to retirement, therefore we recommend maintaining the current assumptions that 85% of Safety and 40% of Miscellaneous deferred members will establish reciprocity. If at the time of the next experience study, data shows that the reciprocity rates continue to fall below the current assumption for Safety, we may recommend a change.

**Table III-T3 – Safety**

Types of Termination for Safety Members			
Service and Type	Actual	Expected	Recommended
0-9 Years of Service			
Withdrawal	8.33%	20.00%	20.00%
Deferral (Vested Term / Transfer)	91.67%	80.00%	80.00%
10-14 Years of Service			
Withdrawal	3.39%	15.00%	15.00%
Deferral	96.61%	85.00%	85.00%
15+ Years of Service			
Withdrawal	2.86%	15.00%	0.00%
Deferral	97.14%	85.00%	100.00%

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**TERMINATION RATES**

**Table III-T4 – Miscellaneous**

Types of Termination for Miscellaneous Members			
Service and Type	Actual	Expected	Recommended
0 Years of Service			
Withdrawal	26.85%	40.00%	40.00%
Deferral (Vested Term / Transfer)	73.15%	60.00%	60.00%
1 Year of Service			
Withdrawal	31.25%	35.00%	35.00%
Deferral	68.75%	65.00%	65.00%
2 Years of Service			
Withdrawal	19.17%	20.00%	20.00%
Deferral	80.83%	80.00%	80.00%
3 Years of Service			
Withdrawal	9.59%	20.00%	20.00%
Deferral	90.41%	80.00%	80.00%
4 Years of Service			
Withdrawal	9.52%	20.00%	20.00%
Deferral	90.48%	80.00%	80.00%
5-14 Years of Service			
Withdrawal	3.40%	10.00%	10.00%
Deferral	96.60%	90.00%	90.00%
15+ Years of Service			
Withdrawal	0.62%	10.00%	0.00%
Deferral	99.38%	90.00%	100.00%

**RECIPROCAL PAY INCREASE**

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 with the reciprocal employer. We recommend that the assumption used to project pay during employment with the reciprocal employer be based on the wage growth assumption, increased by the ultimate merit pay increase assumption described earlier in this report. Therefore, the recommended total pay growth assumption for members in reciprocal status is 3.515% ( $1.03 \times 1.005 - 1$ ) for Miscellaneous members and 4.2875% ( $1.03 \times 1.0125 - 1$ ) for Safety members.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**DISABILITY RATES**

**DISABILITY RATES**

This section analyzes the incidence of disability by the age of the employee. We have combined the experience of the past three years with that of the prior six-year period in order to have a more robust dataset to review. The amount of disability experience is still limited; only 71 disabilities have occurred during the last nine years for Safety and Miscellaneous members combined.

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

The data shows that actual disability rates are lower than expected for Miscellaneous members in aggregate. However, due to the limited amount of experience we recommend retaining the current rates, which are based on the 2017 CalPERS Public Agency Miscellaneous Ordinary Disability rates.

In the last six years, 80% of disabilities were service-related for Miscellaneous members. We recommend maintaining the current assumption that 75% of future disabilities are service-related for Miscellaneous members.

See Appendices A or B for a sample listing of the rates.

MARIN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2023

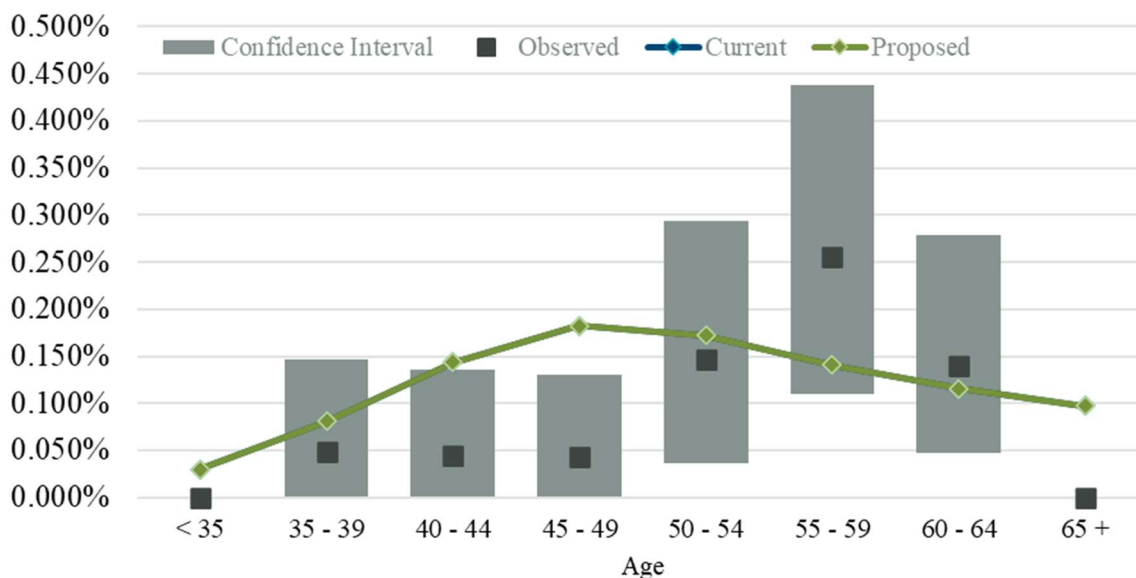
**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**DISABILITY RATES**

**Table III-D1 – Miscellaneous**

Miscellaneous Disability Incidence Rates									
Age Band	Exposures	Disabilities			Average Disability Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
< 35	2,956	0	1	1	0.00%	0.03%	0.03%	0%	0%
35 - 39	2,054	1	2	2	0.05%	0.08%	0.08%	60%	60%
40 - 44	2,216	1	3	3	0.05%	0.14%	0.14%	31%	31%
45 - 49	2,313	1	4	4	0.04%	0.18%	0.18%	24%	24%
50 - 54	2,718	4	5	5	0.15%	0.17%	0.17%	86%	86%
55 - 59	2,740	7	4	4	0.26%	0.14%	0.14%	181%	181%
60 - 64	2,149	3	2	2	0.14%	0.12%	0.12%	120%	120%
<b>Subtotal</b>	<b>14,190</b>	<b>17</b>	<b>20</b>	<b>20</b>	<b>0.12%</b>	<b>0.14%</b>	<b>0.14%</b>	<b>85%</b>	<b>85%</b>
65 +	1,406	0	1	1	0.00%	0.10%	0.10%	0%	0%
<b>TOTAL</b>	<b>18,552</b>	<b>17</b>	<b>22</b>	<b>22</b>	<b>0.09%</b>	<b>0.12%</b>	<b>0.12%</b>	<b>76%</b>	<b>76%</b>
Confidence Interval %			67%	67%					
R-squared			16%	16%					

**Chart III-D1 – Miscellaneous**

**Miscellaneous Disability Incidence Rates**



### SECTION III – DEMOGRAPHIC ASSUMPTIONS DISABILITY RATES

Table III-D2 below shows the calculation of actual-to-expected ratios and the r-squared statistic for all disabilities for Safety members, and Chart III-D2 shows the information graphically.

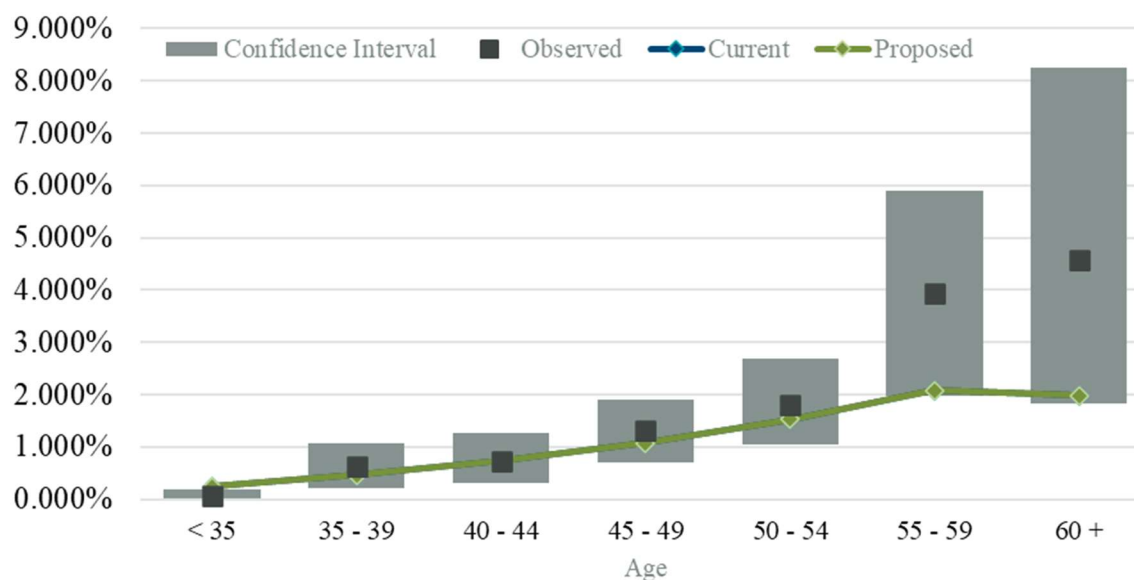
The data shows that actual disability rates are higher than the expected disability rates in aggregate. We are not recommending any changes to these assumptions at this time. We also recommend assuming all Safety disabilities are service-connected, as there have been only two non-service Safety disabilities in the last nine years. See Appendix A or B for a sample listing of the rates.

**Table III-D2 – Safety**

Safety Disability Incidence Rates									
Age Band	Exposures	Disabilities			Average Disability Rates			A/E Ratios	
		Actual	Current	Proposed	Actual	Current	Proposed	Current	Proposed
< 35	1,524	1	4	4	0.07%	0.24%	0.24%	28%	28%
35 - 39	942	6	4	4	0.64%	0.47%	0.47%	136%	136%
40 - 44	956	7	7	7	0.73%	0.73%	0.73%	101%	101%
45 - 49	997	13	11	11	1.30%	1.08%	1.08%	121%	121%
50 - 54	667	12	10	10	1.80%	1.53%	1.53%	118%	118%
55 - 59	254	10	5	5	3.94%	2.09%	2.09%	189%	189%
60 +	109	5	2	2	4.59%	1.98%	1.98%	231%	231%
<b>TOTAL</b>	<b>5,449</b>	<b>54</b>	<b>43</b>	<b>43</b>	<b>0.99%</b>	<b>0.80%</b>	<b>0.80%</b>	<b>124%</b>	<b>124%</b>
Confidence Interval %			100%	100%					
R-squared			70%	70%					

**Chart III-D2 – Safety**

#### Safety Disability Incidence Rates



### **SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES**

Post-retirement mortality assumptions are typically developed separately by sex 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.

The steps in our analysis are as follows:

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

In general, we propose assumption changes when the actual-to-expected (A/E) ratio for the current assumption is significantly different than 100%. However, for those groups that do not have sufficient experience, we may recommend replacement tables based on the experience of the groups that have more credible data. For example, there is very little mortality experience among active members, so we have recommended that MCERA use standard tables for those members, without adjustment to reflect MCERA's experience. We note that the pre-retirement mortality assumptions have very little impact on the liability estimates, because of the very low rates of decrement.

### **SECTION III – DEMOGRAPHIC ASSUMPTIONS MORTALITY RATES**

In the prior study MCERA elected to use the following mortality tables.

#### **Active members**

- Mortality rates for Miscellaneous active members are based on the sex distinct Public General 2010 Employee Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.
- Mortality rates for Safety active members are based on the sex distinct Public Safety 2010 Above-Median Income Employee Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments. 10% of Safety member active deaths are assumed to occur in the line of duty.

#### **Healthy retirees and beneficiaries**

- Mortality rates for Miscellaneous retired members are based on the sex distinct Public General 2010 Healthy Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.
- Mortality rates for Safety retired members are based on the sex distinct Public Safety 2010 Above-Median Income Healthy Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.
- Public Contingent Survivor Mortality Table (PubG-2010), with no adjustment for male beneficiaries and adjusted by 105% for female beneficiaries.

#### **Disabled members**

- Rates of mortality for Miscellaneous disabled members are based on the sex distinct Public General 2010 Disabled Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.
- Rates of mortality for Safety disabled members are based on the sex distinct Public Safety 2010 Disabled Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, adjusted by 95% for males with no adjustment for females.

Since the prior experience study, the Society of Actuaries' Retirement Plans Experience Committee (RPEC) has released one update to the mortality improvement scale, with the most recently published one (MP-2021) reflecting one additional year of data than was used in the development of the scale recommended for use in the prior experience study (MP-2020). We note that MP-2021 is only slightly different from MP-2020 and does not include any data during the pandemic, therefore we do not believe it is necessary to update the improvement scale for the current experience study. Both MP-2021 and MP-2020 were designed with the intent of being applied to mortality on a generational basis. The effect of this is to build in an automatic expectation of future improvements in mortality.



**SECTION III – DEMOGRAPHIC ASSUMPTIONS  
MORTALITY RATES**

MCERA's experience over the past nine years continues to match well with the Pub-2010 rates, after applying the improvement projections from the base year of the tables (2010) using the MP-2020 mortality improvement projections through the mid-point of the nine-year period (2018).

Even with the use of nine years of data, the MCERA experience is only partially credible, based on standard statistical theory. We therefore recommend partially adjusting the Pub-2010 base tables to fit MCERA's experience to develop a new base table. If appropriate, the rates for each age in the standard table have been adjusted by a factor, where the factor is determined by multiplying the actual-to-expected ratio for the group (such as for the Safety male disabled retirees) by a credibility factor which will bring the A/E results closer – but not all the way – to 100%.

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

The only change we are proposing in mortality rates is for Miscellaneous disabled retirees, where we propose reducing the adjustment factor for the Miscellaneous disabled retirees from 100% to 95% of the Public General Disabled Annuitant Mortality Table (PubG-2010).

Table III-M1 shows a summary of the weighted and unweighted exposures, deaths, and the calculation of actual-to-expected death ratios for all groups.

**Table III-M1 – Mortality Summary**

Annuitant Mortality for All Groups								
Annuitant Type	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Proposed	Current	Proposed
Active Members								
Miscellaneous Male	7,251	16	668,170,964	1,417,197	1,345,197	1,345,197	105%	105%
Miscellaneous Female	11,312	9	970,136,238	633,431	1,127,874	1,127,874	56%	56%
Safety Male	4,562	3	547,767,494	368,082	454,631	454,631	81%	81%
Safety Female	887	0	90,685,476	0	50,048	50,048	0%	0%
Healthy Annuitants								
Miscellaneous Male	6,233	174	24,974,430	652,853	677,148	677,148	96%	96%
Miscellaneous Female	10,662	274	29,684,668	643,915	649,351	649,351	99%	99%
Safety Male	3,612	63	26,469,099	374,461	364,348	364,348	103%	103%
Safety Female	449	7	1,772,359	21,695	16,235	16,230	134%	134%
Disabled Annuitants								
Miscellaneous Male	494	11	1,614,080	37,649	69,240	65,778	54%	57%
Miscellaneous Female	708	19	1,833,062	44,493	62,868	59,724	71%	74%
Safety Male	1,693	34	9,863,410	162,881	175,097	175,097	93%	93%
Safety Female	271	4	1,113,870	11,872	9,179	9,179	129%	129%
Beneficiaries								
Male	549	43	1,034,438	52,739	46,032	46,032	115%	115%
Female	3,371	171	8,804,830	409,261	321,936	321,936	127%	127%

**SECTION III – DEMOGRAPHIC ASSUMPTIONS  
MORTALITY RATES**

**Mortality Assumptions for Employee Contribution Rates**

For purposes of determining employee contribution rates for Classic members, the use of generational mortality improvements is impractical from an administrative perspective, because of the entry-age based structure of these rates. Therefore, we recommend using the base mortality tables described above (various Pub-2010 tables with adjustments), projected using Scale MP-2020 from 2010 to 2048 for Miscellaneous members and to 2046 for Safety members. These static projections are intended to approximate generational mortality improvements.

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 40%/60% for Miscellaneous members and 85%/15% for Safety members.

We anticipate that these mortality assumptions will be used to determine the employee contribution rates in effect for the period of July 1, 2024 through June 30, 2027. We also anticipate that the mortality assumptions for this purpose will be updated again after the next experience study covering the period from July 1, 2023 through June 30, 2026.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**OTHER DEMOGRAPHIC ASSUMPTIONS**

**FAMILY COMPOSITION**

Members who are married at the time of retirement are entitled to an unreduced 60% joint and survivor annuity.

An analysis of all members who retired within the last nine years showed that 79% of males are married and 53% of females are married. However, among male members the rates of marriage were higher for the Safety members (88%) than the Miscellaneous members (74%), which is consistent with the current marriage assumptions (85% for Safety males, 75% for Miscellaneous males). On a benefit-weighted basis the rate of marriage for Miscellaneous males was only 65%. The rates of marriage for the Miscellaneous and Safety females were both close to the current assumption (55%), though there was very little Safety female experience. We recommend lowering the rate of marriage for Miscellaneous male retirees from 75% to 70% and keeping the other marital assumptions for future retirees.

An analysis of all retired Miscellaneous members showed that on average male members are 2.0 years older than their spouses and female members are 2.2 years younger than their spouses. Similarly, an analysis of all retired Safety members showed that on average male members are 1.7 years older than their spouses and female members are 3.2 years younger than their spouses. We recommend decreasing the current assumption that male members are three years older than their spouses to two years older and leaving the assumption for female members at two years younger than their spouses.

**TERMINAL SERVICE AND COMPENSATION LOADS**

A load is currently applied to the projected benefits for active members, to account for anticipated conversions of sick leave, end-of-career service purchases, or other terminal earnings to retirement service credit or final compensation.

An analysis of unexpected additional service and earnings for all members with a vested right to a benefit who retired in the last three years without reciprocity is shown in Table III-O1 on the next page.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**OTHER DEMOGRAPHIC ASSUMPTIONS**

**Table III-O1 – Terminal Service and Compensation Loads**

Pay and Service Increases at Retirement 2021-2023 Retirements						
	Count	Expected Monthly Benefit at Retirement	Actual Monthly Benefit at Retirement	Observed Increase	Current Assumption	Proposed Assumption
Non-PEPRA						
Marin						
County	240	\$ 1,175,911	\$ 1,191,426	1.32%	1.50%	1.50%
Courts	15	64,629	65,256	0.97%	1.50%	1.50%
Special Districts	16	78,150	78,867	0.92%	1.50%	1.50%
Total	271	1,318,689	1,335,549	1.28%		
Novato	11	105,331	107,241	1.81%	4.00%	2.00%
San Rafael	34	204,441	207,740	1.61%	1.50%	2.00%
PEPRA	32	36,317	36,830	1.41%	1.50%	1.50%

The increases for all members are due primarily to additional service granted at retirement as a result of unused sick leave. We propose keeping the terminal service load for the County, San Rafael and PEPRA groups at 1.50%.

For Novato Fire, members are also eligible to cash out vacation pay earned and payable in their final service period and may therefore have an additional increase in pensionable compensation not necessarily reflected in their most recent valuation data. Based on a review of their retirement calculations, we propose reducing the load for terminal service and compensation increases for their Classic members from 4.00% to 2.00%.

However, for the Novato members we are also recommending a change in the methodology for projecting future compensation, so as to no longer apply a minimum equal to an annualized amount derived from the member's most recent pay period, as the final pay period of the fiscal year frequently includes these additional cashouts. The net impact of reducing the terminal load for the Novato members *and* modifying the methodology for projecting future compensation is a *reduction* in the liabilities, but an *increase* in the Novato members' employer contribution rates, as the unfunded liability payments are now being spread out over a smaller projected payroll base.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**OTHER DEMOGRAPHIC ASSUMPTIONS**

**DEFERRED RETIREMENT AGE**

An analysis of all terminated members with a vested right to a benefit who retired in the last nine years is shown in Table III-O2. We reviewed the information separately for those members who retired with reciprocity, since they will generally have a greater incentive to defer their retirement. This is especially true for members considering whether to retire once they have reached their maximum retirement benefit age. For example, a 3% at 50 Safety member without reciprocity should have no incentive to defer commencement past age 50 (since their benefit will not increase by doing so), whereas a member with reciprocity may continue to receive pay increases.

The analysis shows that on average Miscellaneous members without reciprocity retire at age 60, which is slightly higher than the current assumption of age 59. Safety 3% at age 50 members retire at age 53.6, and Safety 3% at age 55 members retire at age 54.6.

We recommend retaining the current assumptions for all members.

**Table III-O2 – Deferred Retirement Age**

Deferred Retirement Age 2014-2023 Retirements				
	Count	Average Retirement Age	Current Assumption	Proposed Assumption
Miscellaneous				
No Reciprocity	94	60.4	59	59
With Reciprocity	90	59.7	59	59
Safety				
3% at Age 50				
No Reciprocity	4	51.3	50	50
With Reciprocity	36	53.8	53	53
3% at Age 55				
No Reciprocity	5	56.2	55	55
With Reciprocity	20	54.1	55	55

**SECTION III – DEMOGRAPHIC ASSUMPTIONS**  
**OTHER DEMOGRAPHIC ASSUMPTIONS**

**ADMINISTRATIVE EXPENSES**

The returns discussed in the economic assumption section are expected to be net of investment expenses; administrative expenses are not addressed. Effective with the June 30, 2013 actuarial valuation, MCERA began to include an additional cost item for expected annual administrative expenses in the actuarial cost calculation. For the valuation as of June 30, 2023, we recommend keeping the current administrative expense assumption, with future expenses expected to increase at the wage growth assumption.

**Table III-O3 – Analysis of Administrative Expenses**

FYE	Pension		
	Administrative Expenses	Adjustment to FYE 2024*	Adjusted Expenses
2023	5,431,552	1.0275	5,580,920
2022	4,960,544	1.0571	5,243,712
2021	4,383,839	1.1290	4,949,148
2020	4,607,760	1.1646	5,366,048
2019	5,056,350	1.1834	5,983,651
2018	4,203,705	1.2214	5,134,573
2017	4,404,191	1.2692	5,589,666
2016	4,379,760	1.3134	5,752,200
2015	4,654,623	1.3485	6,276,548
	Adjusted Average (FYE 2021-2023)		5,257,927
	Adjusted Average (FYE 2018-2020)		5,494,757
	Adjusted Average (FYE 2015-2017)		5,872,805
	Adjusted Average (FYE 2015-2023)		5,541,830
	Current Assumption		5,423,948
	Proposed Assumption (FYE 2024)		5,423,948

\* Adjusted to FYE 2023 using increase in Bay Area CPI, plus wage growth at 2.75% for FYE 2024

## **APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

The recommended assumptions will be presented to the Board at their February 14, 2024 meeting. The assumptions are based on an experience study covering experience through June 30, 2023.

### **1. Rate of Return**

Assets are assumed to earn 6.75% net of investment and administrative expenses.

### **2. Administrative Expenses**

Administrative expenses are assumed to be \$5.424 million for the next year, to be split between employees and employers based on their share of the overall contributions. Administrative expenses are assumed to increase 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 2.50% per year.

### **4. Post Retirement COLA for Future Retirees**

Post retirement COLAs for future are assumed at the rate of 2.5% for members with a 4% COLA cap, 2.4% for members with a 3% COLA cap, and 1.9% for members with a 2% COLA cap.

### **5. Post Retirement COLA for Current Retirees**

Post retirement COLAs for current retirees are assumed at the rate of assumed inflation (2.50%) plus any remaining COLA bank up to the COLA cap. For this valuation, the assumption produces COLAs of 4.0% for the upcoming year and 2.5% for all future years for members with a 4% COLA cap, 3.0% for the next five years and 2.4% thereafter for members with a 3% COLA cap, and 2.0% for members with a 2% COLA cap.

### **6. Internal Revenue Code Section 415 Limit**

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit at the time of retirement.

### **7. Internal Revenue Code Section 401(a)(17)**

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is reflected in the valuation to project compensation and benefits. The limit is expected to increase by 2.50% in future years.

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 8. PEPRA Compensation Limit

The PEPRA Pensionable Compensation Limit (GC 7522.10) is reflected in the valuation to project compensation and benefits for PEPRA members. The limit is expected to increase by 2.50% in future years.

### 9. Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 6.75%.

### 10. Sick Leave Service Credit Upon Retirement

Active members' benefits are adjusted by a percentage, in accordance with the table below, for anticipated conversions of sick leave or other terminal earnings to retirement service credit or final compensation.

	Rate
Classic	
Marin County	1.50%
Marin Courts	1.50%
Marin Special Districts	1.50%
Novato Fire Protection District	2.00%
City of San Rafael	1.50%
PEPRA	1.50%

### 11. Family Composition

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

Percentage Married	
Class and Gender	Percentage
Miscellaneous Males	70%
Miscellaneous Females	55%
Safety Males	85%
Safety Females	55%



## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 12. Increases in Pay

Wage inflation component: 3.00%

Additional longevity and promotion component:

Service	Miscellaneous	Safety
0	6.00%	5.25%
1	6.00%	5.25%
2	5.00%	5.00%
3	4.00%	4.75%
4	3.00%	4.50%
5	2.25%	2.25%
6	1.75%	1.75%
7	1.40%	1.25%
8	1.20%	1.25%
9	1.00%	1.25%
10	0.85%	1.25%
11	0.85%	1.25%
12	0.85%	1.25%
13	0.85%	1.25%
14	0.85%	1.25%
15	0.85%	1.25%
16	0.85%	1.25%
17+	0.50%	1.25%

### 13. Overall Pensionable Compensation Growth

Overall pensionable compensation – used in the calculation of the UAL amortization payments – is expected to increase by 2.75% in future years.

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 14. Rates of Termination (All Types)

Sample rates of termination are shown in the following tables. Note that termination rates do not apply once a member is eligible for retirement.

Service	Miscellaneous	Safety
0	14.00%	10.00%
1	13.00%	8.00%
2	12.00%	6.00%
3	9.50%	6.00%
4	8.25%	5.00%
5	7.50%	4.50%
6	6.75%	4.00%
7	6.25%	3.50%
8	5.75%	3.00%
9	5.25%	2.75%
10	5.00%	2.50%
11	4.75%	2.00%
12	4.50%	1.75%
13	4.25%	1.50%
14	4.00%	1.25%
15	3.50%	1.00%
16	3.25%	1.00%
17	3.00%	1.00%
18	2.75%	1.00%
19	2.50%	1.00%
20+	1.00%	0.00%

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 15. Withdrawal, Reciprocal Transfers, and Vested Termination

The following rates apply to active members who terminate their employment. Members who withdraw their member contributions forfeit entitlement to future Plan benefits.

Service	Miscellaneous			Safety		
	Withdrawal	Reciprocal	Vested Term	Withdrawal	Reciprocal	Vested Term
0	40.00%	24.00%	36.00%	20.00%	68.00%	12.00%
1	35.00%	26.00%	39.00%	20.00%	68.00%	12.00%
2	20.00%	32.00%	48.00%	20.00%	68.00%	12.00%
3	20.00%	32.00%	48.00%	20.00%	68.00%	12.00%
4	20.00%	32.00%	48.00%	20.00%	68.00%	12.00%
5 - 9	10.00%	36.00%	54.00%	20.00%	68.00%	12.00%
10 - 14	10.00%	36.00%	54.00%	15.00%	72.25%	12.75%
15+	0.00%	40.00%	60.00%	0.00%	85.00%	15.00%

### 16. Rates of Disability

The rates of disability for Miscellaneous members are based on the 2017 CalPERS Public Agency Miscellaneous Ordinary Disability rates for males and females without adjustment.

The rates of disability for Safety members are based on adjusted 2020 CalPERS Peace Officers and Fire Fighter (POFF) Industrial and Ordinary Disability rates (multiplied by 120%).

75% of all Miscellaneous and 100% of all Safety disabilities are assumed to be service-connected. Sample *service-connected* disability rates of active participants are shown below.

Age	Miscellaneous		Safety
	Male	Female	
20	0.0042%	0.0025%	0.0000%
25	0.0042%	0.0025%	0.0000%
30	0.0047%	0.0600%	0.0000%
35	0.0097%	0.0178%	0.0000%
40	0.0255%	0.0338%	0.0000%
45	0.0377%	0.0470%	0.0000%
50	0.0395%	0.0498%	0.0000%
55	0.0395%	0.0373%	0.0000%
60	0.0382%	0.0263%	0.0000%
65	0.0320%	0.0220%	0.0000%

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

Sample *non service-connected* disability rates of active participants are shown below.

Age	Miscellaneous		Safety
	Male	Female	
20	0.0042%	0.0025%	0.0000%
25	0.0042%	0.0025%	0.0000%
30	0.0047%	0.0600%	0.0000%
35	0.0097%	0.0178%	0.0000%
40	0.0255%	0.0338%	0.0000%
45	0.0377%	0.0470%	0.0000%
50	0.0395%	0.0498%	0.0000%
55	0.0395%	0.0373%	0.0000%
60	0.0382%	0.0263%	0.0000%
65	0.0320%	0.0220%	0.0000%

### 17. Reciprocal Transfers and Vested Termination Deferral Age

Miscellaneous members who terminate employment and do not withdraw their member contributions are assumed to retire at age 59. Safety members who terminate employment and do not withdraw their member contributions are assumed to retire at age 50 if their benefits are calculated under CERL section 31664.1 and are not currently working in reciprocal service, age 53 if their benefits are calculated under CERL section 31664.1 and they are in reciprocal service, and age 55 otherwise.

### 18. Projected Pay for Reciprocal Transfers

Members who terminate and transfer in the future to a reciprocal employer are expected to have their wages increase from their date of termination to the valuation date by 3.00% wage inflation and either 0.50% for Miscellaneous members or 1.25% for Safety members, with the additional increases applied multiplicatively.

Members who have terminated and transferred to a reciprocal employer or have transferred within MCERA are assumed to have the same salary increases and are exposed to the same rates of mortality and retirement as if they were active. No other decrements are assumed.

### 19. Rates of Mortality for Active Lives

Mortality rates for Miscellaneous active members are based on the sex distinct Public General 2010 Employee Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

## **APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

Mortality rates for Safety active members are based on the sex distinct Public Safety 2010 Above-Median Income Employee Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments. 10% of Safety member active deaths are assumed to occur in the line of duty.

### **20. Rates of Mortality for Retired Healthy Lives**

Mortality rates for Miscellaneous retired members are based on the sex distinct Public General 2010 Healthy Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

Mortality rates for Safety retired members are based on the sex distinct Public Safety 2010 Above-Median Income Healthy Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

### **21. Rates of Mortality for Retired Disabled Lives**

Rates of mortality for Miscellaneous disabled members are based on the sex distinct Public General 2010 Disabled Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, adjusted by 95% for females and males.

Rates of mortality for Safety disabled members are based on the sex distinct Public Safety 2010 Disabled Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, adjusted by 95% for males with no adjustment for females.

### **22. Rates of Mortality for Beneficiaries**

Rates of mortality for members' beneficiaries once their benefits commence are given by sex distinct Public 2010 Contingent Survivor Mortality Table, using General 2010 Healthy Retiree Mortality Table before age 45, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, adjusted by 105% for females and no adjustments to males. Prior to the death of the member, the mortality of the beneficiaries is assumed to use the same sex distinct assumptions as the retired healthy members.

### **23. Mortality Improvement**

Mortality is assumed to improve in future years in accordance with the MP-2020 generational improvement tables.

### **24. Rates of Retirement**

Rates of retirement are based on age according to the following tables below. Note that retirement rates do not apply until a member is eligible for retirement.

MARIN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2023

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**Classic and PEPRA Miscellaneous Rates**

Age	<20 Years of Service	20-29 Years of Service	30+ Years of Service
50-52	3.00%	3.00%	3.00%
53	5.00%	5.00%	10.00%
54	5.00%	5.00%	15.00%
55-59	5.00%	10.00%	15.00%
60	10.00%	10.00%	30.00%
61	10.00%	10.00%	30.00%
62	12.00%	20.00%	30.00%
63	14.00%	20.00%	30.00%
64	16.00%	20.00%	30.00%
65	18.00%	20.00%	30.00%
66-69	20.00%	30.00%	30.00%
70-79	25.00%	30.00%	30.00%
80	100.00%	100.00%	100.00%

**Classic Safety Rates**

Age	3% @ 50 <20 Years of Service	3% @ 50 20-29 Years of Service	3% @ 50 30+ Years of Service
40-48	0.00%	3.00%	50.00%
49	0.00%	15.00%	50.00%
50	5.00%	15.00%	50.00%
51-52	5.00%	10.00%	50.00%
53-54	10.00%	10.00%	50.00%
55	10.00%	25.00%	50.00%
56	10.00%	30.00%	50.00%
57	10.00%	35.00%	50.00%
58	10.00%	40.00%	50.00%
59	10.00%	45.00%	50.00%
60-64	50.00%	50.00%	50.00%
65	100.00%	100.00%	100.00%

**APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS**

**Classic Safety Rates (Continued)**

<b>3.0% @ 55</b>			
<b>Safety Police Sample Rates</b>			
<b>Age</b>	<b>&lt;20 Years of Service</b>	<b>20-29 Years of Service</b>	<b>30+ Years of Service</b>
45 - 49	0.00%	8.00%	50.00%
50 - 54	2.00%	8.00%	50.00%
55	10.00%	40.00%	50.00%
56 - 64	10.00%	15.00%	50.00%
65	100.00%	100.00%	100.00%

**PEPRA Safety Rates**

<b>2017 CalPERS 2.7% @ 57 Public Agency</b>			
<b>Safety Police Sample Rates</b>			
<b>Age</b>	<b>15 Years of Service</b>	<b>20 Years of Service</b>	<b>25 Years of Service</b>
50	5.00%	5.00%	5.00%
51	4.00%	4.00%	5.75%
52	3.80%	3.80%	5.80%
53	3.80%	3.80%	7.74%
54	3.80%	4.37%	9.31%
55	6.84%	9.12%	13.40%
56	6.27%	8.36%	12.28%
57	6.00%	8.00%	11.75%
58	8.00%	8.80%	13.75%
59	8.00%	9.20%	14.00%
60	15.00%	15.00%	15.00%
61	14.40%	14.40%	14.40%
62	15.00%	15.00%	15.00%
63	15.00%	15.00%	15.00%
64	15.00%	15.00%	15.00%
65	100.00%	100.00%	100.00%

## **APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

The assumptions and methods used in the actuarial valuation as of June 30, 2022 are based on an experience study covering experience through June 30, 2020, as adopted by the Board at a meeting on January 13, 2021.

### **1. Rate of Return**

Assets are assumed to earn 6.75% net of investment, but not administrative expenses.

### **2. Administrative Expenses**

Administrative expenses are assumed to be \$5.279 million for the next year, to be split between employees and employers based on their share of the overall contributions. Administrative expenses are assumed to increase 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 2.50% per year.

### **4. Post Retirement COLA**

Post retirement COLAs are assumed at the rate of 2.5% for members with a 4% COLA cap, 2.4% for members with a 3% COLA cap, and 1.9% for members with a 2% COLA cap.

### **5. Internal Revenue Code Section 415 Limit**

The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit at the time of retirement.

### **6. Internal Revenue Code Section 401(a)(17)**

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is reflected in the valuation to project compensation and benefits. The limit is expected to increase by 2.50% in future years.

### **7. PEPPRA Compensation Limit**

The PEPPRA Pensionable Compensation Limit (GC 7522.10) is reflected in the valuation to project compensation and benefits for PEPPRA members. The limit is expected to increase by 2.50% in future years.

### **8. Interest on Member Contributions**

The annual credited interest rate on member contributions is assumed to be 6.75%.



## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 9. Sick Leave Service Credit Upon Retirement

Active members' benefits are adjusted by a percentage, in accordance with the table below, for anticipated conversions of sick leave or other terminal earnings to retirement service credit or final compensation.

	Rate
Classic	
Marin County	1.50%
Marin Courts	1.50%
Marin Special Districts	1.50%
Novato Fire Protection District	4.00%
City of San Rafael	1.50%
PEPRA	1.50%

### 10. Family Composition

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

Percentage Married	
Class and Gender	Percentage
Miscellaneous Males	75%
Miscellaneous Females	55%
Safety Males	85%
Safety Females	55%

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 11. Increases in Pay

Wage inflation component: 3.00%

Additional longevity and promotion component:

Service	Miscellaneous	Safety
0	6.00%	5.00%
1	6.00%	5.00%
2	5.00%	4.50%
3	4.00%	4.00%
4	3.00%	3.50%
5	2.25%	3.00%
6	1.75%	2.50%
7	1.40%	2.20%
8	1.20%	1.90%
9	1.00%	1.70%
10	0.85%	1.50%
11	0.75%	1.40%
12	0.75%	1.30%
13+	0.75%	1.25%

### 12. Overall Pensionable Compensation Growth

Overall pensionable compensation – used in the calculation of the UAL amortization payments – is expected to increase by 2.75% in future years.

### 13. Rates of Termination (All Types)

Sample rates of termination are shown in the following tables below. Note that termination rates do not apply once a member is eligible for retirement.

MARIN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2023

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

Service	Miscellaneous	Service	Miscellaneous
0	14.00%	11	4.75%
1	13.00%	12	4.50%
2	12.00%	13	4.25%
3	9.50%	14	4.00%
4	8.25%	15	3.50%
5	7.50%	16	3.25%
6	6.75%	17	3.00%
7	6.25%	18	2.75%
8	5.75%	19	2.50%
9	5.25%	20+	0.00%
10	5.00%		

Service	Safety
0	9.00%
1	7.00%
2	5.00%
3	5.00%
4	5.00%

	Safety
Age	5-19 Years of Service
20	2.06%
25	2.24%
30	3.53%
35	3.41%
40	1.14%
45	1.70%
50	0.27%
55	0.09%
60	0.00%

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 14. Withdrawal, Reciprocal Transfers and Vested Termination

The following rates apply to active members who terminate their employment. Members who withdraw their member contributions forfeit entitlement to future Plan benefits.

Service	Miscellaneous			Safety		
	Withdrawal	Reciprocal	Vested Term	Withdrawal	Reciprocal	Vested Term
0	40.00%	24.00%	36.00%	20.00%	68.00%	12.00%
1	35.00%	26.00%	39.00%	20.00%	68.00%	12.00%
2	20.00%	32.00%	48.00%	20.00%	68.00%	12.00%
3	20.00%	32.00%	48.00%	20.00%	68.00%	12.00%
4	20.00%	32.00%	48.00%	20.00%	68.00%	12.00%
5 - 9	10.00%	36.00%	54.00%	20.00%	68.00%	12.00%
10 - 14	10.00%	36.00%	54.00%	15.00%	72.25%	12.75%
15+	0.00%	40.00%	60.00%	0.00%	85.00%	15.00%

### 15. Reciprocal Transfers and Vested Termination Deferral Age

Miscellaneous members who terminate employment and do not withdraw their member contributions are assumed to retire at age 59. Safety members who terminate employment and do not withdraw their member contributions are assumed to retire at age 50 if their benefits are calculated under CERL section 31664.1 and are not currently working in reciprocal service, age 53 if their benefits are calculated under CERL section 31664.1 and they are in reciprocal service, and age 55 otherwise.

### 16. Projected Pay for Reciprocal Transfers

Members who terminate and transfer to a reciprocal employer are expected to have their wages increase from their date of termination to their assumed retirement age by 3.00% wage inflation and either 0.75% for Miscellaneous members or 1.25% for Safety members.

Members who have terminated and transferred to a reciprocal employer or have transferred within MCERA are assumed to have the same salary increases and are exposed to the same rates of mortality and retirement as if they were active. No other decrements are assumed.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 17. Rates of Disability

The rates of disability for Miscellaneous members are based on the 2017 CalPERS Public Agency Miscellaneous Ordinary Disability rates for males and females without adjustment.

The rates of disability for Safety members are based on adjusted 2020 CalPERS Peace Officers and Fire Fighter (POFF) Industrial and Ordinary Disability rates (multiplied by 120%).

75% of all Miscellaneous and 100% of all Safety disabilities are assumed to be service-connected. Sample *service-connected* disability rates of active participants are shown below.

Age	Miscellaneous		Safety
	Male	Female	
20	0.0128%	0.0075%	0.0828%
25	0.0128%	0.0075%	0.1404%
30	0.0143%	0.0180%	0.2364%
35	0.0293%	0.0533%	0.3828%
40	0.0765%	0.1013%	0.6048%
45	0.1133%	0.1410%	0.9192%
50	0.1185%	0.1493%	1.3500%
55	0.1185%	0.1119%	1.9020%
60	0.1148%	0.0780%	2.5848%
65	0.0960%	0.0660%	3.4164%

Sample *non service-connected* disability rates of active participants are shown below.

Age	Miscellaneous		Safety
	Male	Female	
20	0.0042%	0.0025%	0.0000%
25	0.0042%	0.0025%	0.0000%
30	0.0047%	0.0600%	0.0000%
35	0.0097%	0.0178%	0.0000%
40	0.0255%	0.0338%	0.0000%
45	0.0377%	0.0470%	0.0000%
50	0.0395%	0.0498%	0.0000%
55	0.0395%	0.0373%	0.0000%
60	0.0382%	0.0263%	0.0000%
65	0.0320%	0.0220%	0.0000%

## **APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

### **18. Rates of Mortality for Active Lives**

Mortality rates for Miscellaneous active members are based on the sex distinct Public General 2010 Employee Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

Mortality rates for Safety active members are based on the sex distinct Public Safety 2010 Above-Median Income Employee Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments. 10% of Safety member active deaths are assumed to occur in the line of duty.

### **19. Rates of Mortality for Retired Healthy Lives**

Mortality rates for Miscellaneous retired members are based on the sex distinct Public General 2010 Healthy Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

Mortality rates for Safety retired members are based on the sex distinct Public Safety 2010 Above-Median Income Healthy Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

### **20. Rates of Mortality for Retired Disabled Lives**

Rates of mortality for Miscellaneous disabled members are based on the sex distinct Public General 2010 Disabled Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, with no adjustments.

Rates of mortality for Safety disabled members are based on the sex distinct Public Safety 2010 Disabled Retiree Mortality Table, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, adjusted by 95% for males with no adjustment for females.

### **21. Rates of Mortality for Beneficiaries**

Rates of mortality for members' beneficiaries once their benefits commence are given by sex distinct Public 2010 Contingent Survivor Mortality Table, using General 2010 Healthy Retiree Mortality Table before age 45, with generational mortality improvements projected from 2010 using Projection Scale MP-2020, adjusted by 105% for females and no adjustments to males. Prior to the death of the member, the mortality of the beneficiaries is assumed to use the same sex distinct assumptions as the retired healthy members.

### **22. Mortality Improvement**

Mortality is assumed to improve in future years in accordance with the MP-2020 generational improvement tables.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 23. Rates of Retirement

Rates of retirement are based on age according to the following tables below.

#### Classic Miscellaneous Rates

Age	<20 Years of Service	20-29 Years of Service	30+ Years of Service
50-52	3.00%	3.00%	3.00%
53	5.00%	5.00%	10.00%
54	5.00%	5.00%	15.00%
55-59	5.00%	10.00%	15.00%
60	10.00%	10.00%	30.00%
61	10.00%	10.00%	30.00%
62	12.00%	20.00%	30.00%
63	14.00%	20.00%	30.00%
64	16.00%	20.00%	30.00%
65	18.00%	20.00%	30.00%
66-69	20.00%	30.00%	30.00%
70-79	25.00%	30.00%	30.00%
80	100.00%	100.00%	100.00%

#### PEPRA Miscellaneous Rates

2017 CalPERS 2.0% @ 62 Public Agency Miscellaneous Sample Rates			
Age	15 Years of Service	20 Years of Service	25 Years of Service
52	1.20%	1.50%	1.90%
55	2.80%	3.60%	6.10%
60	7.10%	9.10%	11.10%
61	7.90%	10.00%	12.10%
62	10.40%	13.40%	16.40%
63	13.40%	16.30%	19.20%
64	12.90%	15.80%	18.70%
65	17.30%	20.60%	23.90%
66	21.20%	25.20%	29.20%
67	21.20%	25.20%	29.20%
68-74	19.30%	22.90%	26.50%
75+	100.00%	100.00%	100.00%

MARIN COUNTY EMPLOYEES' RETIREMENT ASSOCIATION  
EXPERIENCE STUDY AS OF JUNE 30, 2023

**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

**Classic Safety Rates**

Age	3% @ 50 <20 Years of Service	3% @ 50 20-29 Years of Service	3% @ 50 30+ Years of Service
40-44	0.00%	3.00%	3.00%
45-48	0.00%	3.00%	3.00%
49	0.00%	15.00%	15.00%
50	5.00%	15.00%	50.00%
51-52	5.00%	10.00%	20.00%
53-54	10.00%	10.00%	20.00%
55	10.00%	25.00%	50.00%
56	10.00%	30.00%	50.00%
57	10.00%	35.00%	50.00%
58	10.00%	40.00%	50.00%
59	10.00%	45.00%	50.00%
60-64	50.00%	50.00%	50.00%
65	100.00%	100.00%	100.00%

2017 CalPERS 3.0% @ 55 Public Agency Safety Police Sample Rates			
Age	15 Years of Service	20 Years of Service	25 Years of Service
50	3.50%	3.50%	7.00%
51	2.80%	2.90%	6.50%
52	3.20%	3.90%	6.60%
53	2.80%	4.30%	7.50%
54	3.80%	7.40%	11.80%
55	7.00%	12.00%	17.50%
56	6.00%	11.00%	16.50%
57	6.00%	11.00%	16.50%
58	8.00%	10.00%	18.50%
59	9.50%	13.00%	18.50%
60	15.00%	15.00%	18.50%
61	12.00%	12.00%	16.00%
62	15.00%	15.00%	20.00%
63	15.00%	15.00%	20.00%
64	15.00%	15.00%	17.50%
65	100.00%	100.00%	100.00%



**APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS**

**PEPRA Safety Rates**

2017 CalPERS 2.7% @ 57 Public Agency			
Safety Police Sample Rates			
Age	15 Years of Service	20 Years of Service	25 Years of Service
50	5.00%	5.00%	5.00%
51	4.00%	4.00%	5.75%
52	3.80%	3.80%	5.80%
53	3.80%	3.80%	7.74%
54	3.80%	4.37%	9.31%
55	6.84%	9.12%	13.40%
56	6.27%	8.36%	12.28%
57	6.00%	8.00%	11.75%
58	8.00%	8.80%	13.75%
59	8.00%	9.20%	14.00%
60	15.00%	15.00%	15.00%
61	14.40%	14.40%	14.40%
62	15.00%	15.00%	15.00%
63	15.00%	15.00%	15.00%
64	15.00%	15.00%	15.00%
65	100.00%	100.00%	100.00%



*Classic Values, Innovative Advice*