

Merced County Employees' Retirement Association

**Actuarial Experience Study
for July 1, 2013 through
June 30, 2016**

Produced by Cheiron

February 2016

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February 15, 2017

Retirement Board of Merced
County Employees' Retirement Association
3199 M Street
Merced, CA 95348

Dear Members of the Board:

The purpose of this report is to provide the results of an Actuarial Experience Study of the Merced County Employees' Retirement Association (MCERA) covering actuarial experience from July 1, 2013 through June 30, 2016. This report is for the use of the MCERA Retirement Board in selecting assumptions to be used in actuarial valuations beginning June 30, 2016.

In preparing our report, we relied on information (some oral and some written) supplied by MCERA. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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. This report is not intended to benefit any other party, and Cheiron assumes no duty or liability to any such party.

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

Sincerely,
Cheiron

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

Graham A. Schmidt, ASA, EA, FCA, MAAA
Consulting Actuary

A handwritten signature in blue ink, reading "David Holland".

David Holland, FSA, FCA, MAAA, EA
Consulting Actuary

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

SECTION I – EXECUTIVE SUMMARY

Actuarial assumptions (economic and demographic) are intended to be long-term in nature, and should be both individually reasonable and consistent in the aggregate. The purpose of this experience study is to evaluate whether or not the current assumptions adequately reflect the long-term expectations for 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 inflation, COLA growth, and the discount rate. These assumptions have a significant impact on the contribution rates in the short-term and the risk of negative outcomes in the long-term.

The economic assumptions recently adopted by the Retirement Board include a 7.25% long-term rate of return on Plan assets, an annual increase in prices measured by the Consumer Price Index (CPI) of 2.50%, annual wage increase equal to 25 basis points greater than the price increase (2.75% in total), and a post-retirement COLA average growth rate of 2.40% for Tier 1 members.

The nominal discount rate assumption is very close to the geometric average long-term (10-year) return of 7.3% for the current target portfolio based on the capital market assumptions provided by Verus, the Plan's investment consultant. Based on these capital market assumptions, the real return adopted by the Board (4.75%) has a greater than 50% chance of being achieved. We also reviewed the capital market assumptions from three other investment consultants (including the Verus assumptions for non-former SIS clients), and though they forecast a slightly lower than 50% chance of achieving the 7.25% nominal return, they all anticipate a 50% or greater chance of achieving the 4.75% real return over the next 7-10 years.

Other data presented in this report support the finding that the discount rate and other economic assumptions adopted by the Retirement Board are reasonable.

SUMMARY OF DEMOGRAPHIC ASSUMPTION ANALYSIS

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

- **Retirement rates** – Adjustments to General rates at all service levels. Increase Safety rates with less than 20 years of service. No change to the approach recommended for PEPPRA tiers due to lack of experience
- **Termination rates** – Modest adjustments to the General male rates. No adjustment to General female and Safety rates.
- **Disability rates** – Adjustments to the Safety rates. No change for the General rates.
- **Mortality rates** – CalPERS base tables, with generational improvement for all members.

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SECTION I – EXECUTIVE SUMMARY

- **Merit salary increases** – Increase ultimate rate and the rates for lower service points. Reduce the rates for mid-service points.
- **Other assumptions** – Adjustments to other assumptions, including the withdrawal and reciprocal transfer rates, deferred retirement commencement age, family composition and terminal pay load assumptions.

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

COST OF ECONOMIC AND DEMOGRAPHIC ASSUMPTION CHANGES

Among the demographic assumptions, the recommended changes to mortality and the terminal payload have the largest impact on contribution rates. This table summarizes the estimated cost impact – for the General, Safety, and combined membership – of the recommended changes to economic and demographic assumptions contained in this report.

Table I-1

Impact on Contribution Rates			
	General Contribution Rate	Safety Contribution Rate	Total Contribution Rate
Mortality Rates	0.49%	0.19%	0.44%
Retirement Rates	-0.04%	0.04%	-0.03%
Termination Rates	-0.09%	0.00%	-0.08%
Disability Rates	0.00%	-0.35%	-0.06%
Withdrawal and Reciprocal Transfer Rates	-0.01%	-0.35%	-0.07%
Reciprocal Deferral Age	-0.03%	-0.08%	-0.04%
Spouse Age	0.02%	0.01%	0.02%
Percent Married	-0.08%	0.00%	-0.06%
Salary Merit Increases	0.21%	-0.39%	0.09%
FAC Load	-0.51%	-0.74%	-0.55%
COLA / Benefit Timing	-0.19%	-0.14%	-0.18%
Plan Expenses	0.26%	0.35%	0.27%
Total Effect of Demographic Changes	0.02%	-1.45%	-0.25%
Economic Assumption Changes	1.82%	2.57%	1.94%
All Assumption Changes	1.84%	1.11%	1.69%
Ultimate Effect after Phase-in			3.31%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION**

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

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

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

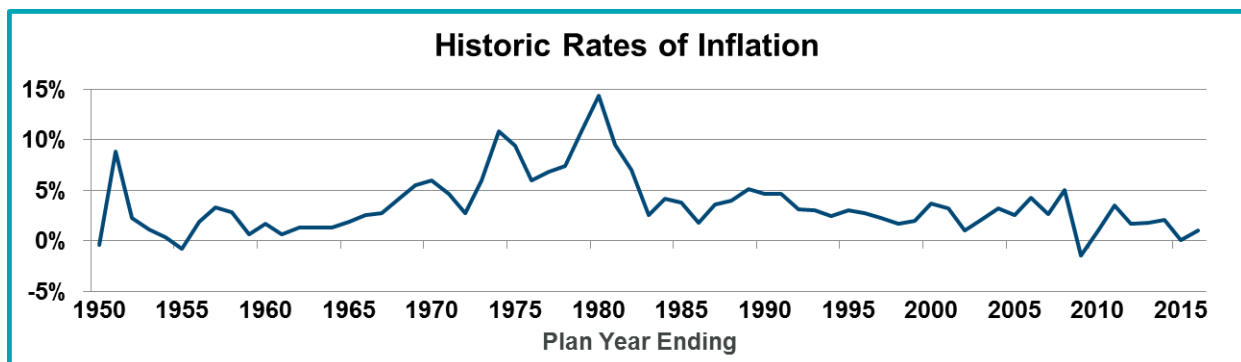
PRICE INFLATION

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

Historical Data

Chart II-1 below shows inflation for the U.S. by Plan year (ending June 30) since 1950.

Chart II-1



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION**

Over the 50 years ending June 2016, the geometric average inflation rate for the U.S. has been about 4.1%, 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 2.7%, and only about 1.7% over the past 10 years.

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. Table II-1 shows the yields on both types of bonds and the break-even inflation rate as of June 2016. Break-even inflation is the level of inflation needed for an investment in TIPS to “break even” with an investment in conventional treasury bonds of the same maturity.

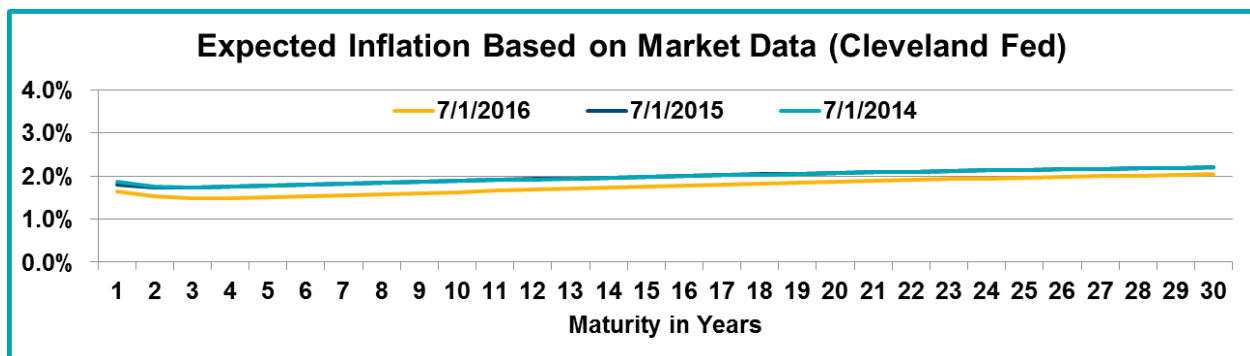
Table II-1

Break-Even Inflation Based on Treasury Bond Yields			
Time to Maturity	Conventional Yield	TIPS Yield	Break Even Inflation
5 Years	1.2%	-0.3%	1.5%
10 Years	1.6%	0.2%	1.4%
20 Years	2.0%	0.6%	1.4%
30 Years	2.5%	0.8%	1.7%

Data Source Federal Reserve, Constant Maturity Yields, Monthly Series

The Federal Reserve Bank of Cleveland publishes a forecast of inflation based primarily on this same data, as well as additional information such as inflation swaps and surveys of professional forecasters. Chart II-2 shows a summary of their published expectations as of the last three valuation dates (the 2014 and 2015 rates largely overlap).

Chart II-2

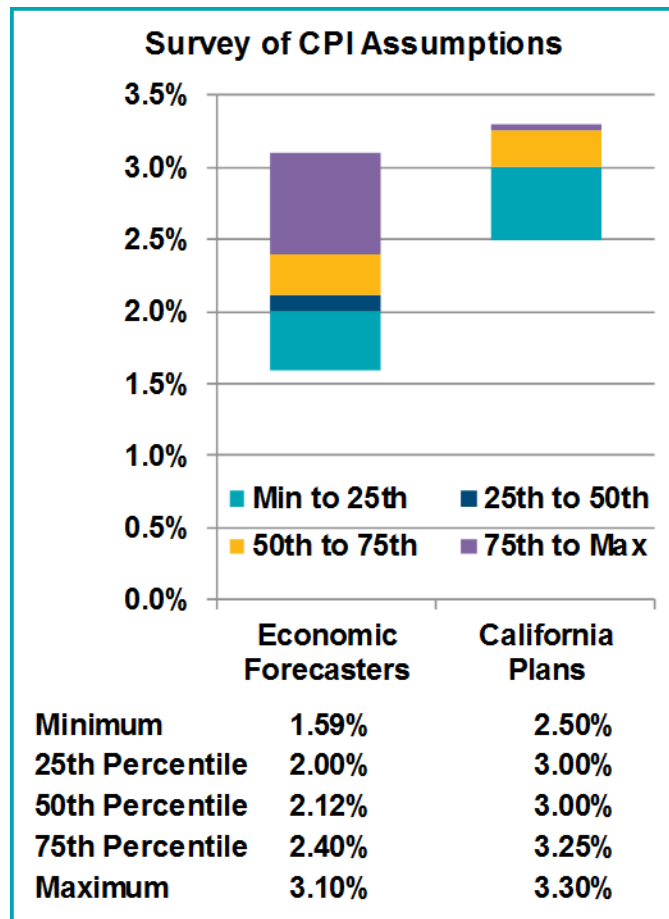


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**SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION**

The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters. Chart II-3 shows the distribution of the professionals forecasts for average inflation over the next 10 years compared to assumptions used by California public pension plans.

Chart II-3



Finally, Verus, the Board's investment consultant, uses an inflation assumption of around 2%, similar but slightly lower than 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 2.00% and 3.00%. Therefore, we agree with the Board's recent action to reduce the assumption from 3.00% to 2.50%. Although the comparison between the conventional Treasury bond and TIPS yields indicates a breakeven inflation rate below 2.50%, we note that this spread (as well as other market indicators of inflation) can be quite volatile; the spread between these securities increased by approximately 50 basis points during the second half of 2016 (from 1.4% to 1.9% for the 20 year security yields).

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**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 and, for purposes of amortizing the Unfunded Actuarial Liability, the rate at which payroll is expected to grow over the long term, assuming a stable active member population.

Over the past 25 years, mean real wage growth (as measured by the Social Security Administration) averaged 0.77% per year. However, over the same time period the increase in the median real wage was only 0.42% per year, as much of the growth in wages was clustered at the top end of the wage scale. Median real weekly non-farm wages have increased by only 0.21% from 1985-2015 and by 0.24% from 2005-2015, based on the Bureau of Labor Statistics (BLS) Current Population Survey.

It is acceptable to assume some additional level of base payroll increase beyond general inflation. Potential reasons contributing to the increase may include the presence of strong union representation in the collective bargaining process, competition in hiring among other similar employers, and regional factors – such as the local inflation index exceeding the national average, as has sometimes proven the case in parts of California. Also, historically the US as a whole witnessed 0.9% annual real growth in wages from 1970-2010, and the Social Security Administration projects real wage growth of 0.5% - 1.8% going forward in their Social Security solvency projections. Finally, local governments across the United States have experienced some positive real wage growth over the past 10 years (0.6% per year, based on the BLS Quarterly Census of Employment and Wages).

However, governmental entities remain under financial stress, and other areas of employee compensation – most notably health care costs and pension contributions – have continued to increase faster than the CPI. The Social Security Administration noted in a recent report that the real wage differential has actually been negative (-0.2%) over the most recent economic cycle (2007-2013).

Cheiron agrees with the Board's recent action to implement a non-inflationary base payroll growth assumption of 0.25% annually. As a result of this increase and the 0.50% decrease in price inflation, the annual expected increase in base payroll would be 2.75%, reduced from 3.00% in the June 30, 2015 valuation. This increase will be applied to all continuing active members, and to starting pay for new entrants when projections of future populations are required. This increase will also be used in the calculation of the unfunded liability amortization payment as a level percentage of payroll.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
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**SECTION II – ECONOMIC ASSUMPTIONS
COLA GROWTH**

COLA GROWTH

Tier 1 members of MCERA are eligible to receive automatic Cost-of-Living Adjustments (COLAs), based on the growth in the Bay Area Consumer Price Index (CPI) with a 3% cap on the annual COLA increase. Any increase in the CPI above the 3% maximum increase can be banked for future years in which the change in the CPI is below 3%.

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

We have produced statistical simulations of inflation and then modeled how the COLA maximum and the banking process interact with the changes in CPI. For a given long-term estimate of inflation, we used two sets of inputs and then blended the results: a 50% autocorrelation factor with 1.5% annual inflation volatility, and a 25% autocorrelation factor with 1.0% annual inflation volatility. A starting inflation level of 2.25% was used in all simulations, to reflect the low level of current inflation.

Based on a blending of the results under the two sets of inputs, and using the 2.50% inflation assumption adopted by the Board and found to be reasonable by Cheiron, we recommend decreasing the COLA growth assumption from 2.60% to 2.40%.

SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE

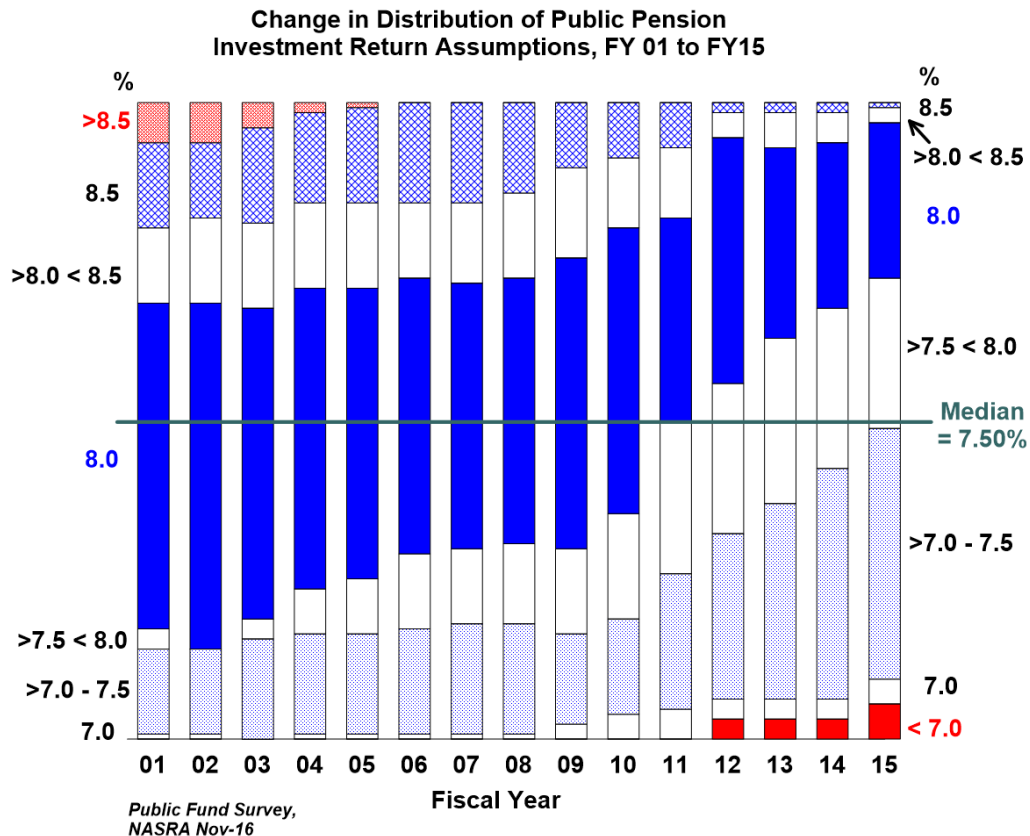
DISCOUNT RATE

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 7.50% and the number of plans using a discount rate of 7.5% or lower has increased significantly.

Chart II-4

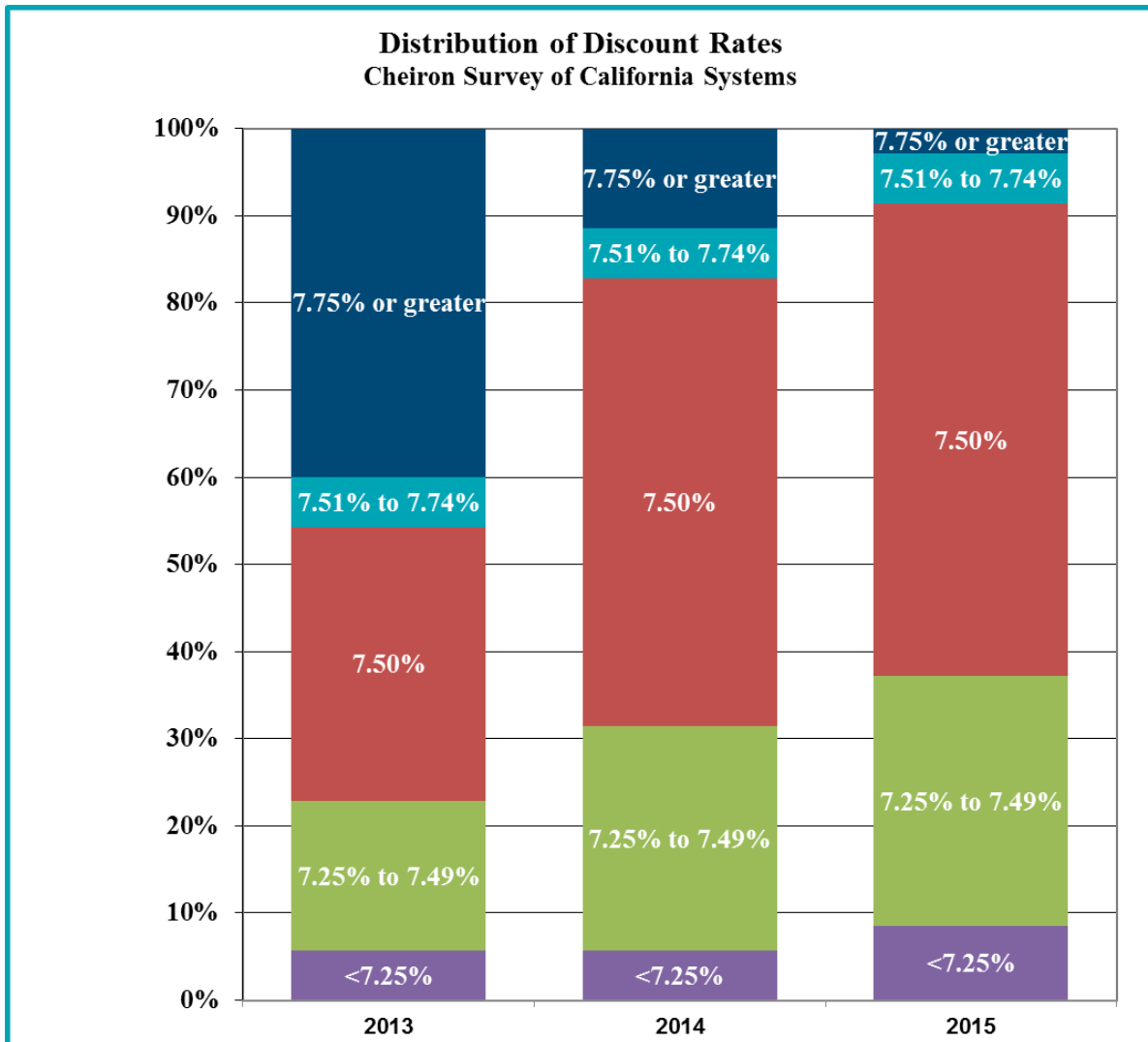


MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
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SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE

In our survey of California retirement systems, the median assumption is the same at 7.50% with 19 of the 35 systems using the median rate as of 2015. Only one system used a rate as high as 7.75%, which has since been lowered. Chart II-5 below shows the change in discount rate assumptions for California systems from 2013 to 2015.

Chart II-5



Target Asset Allocation and Future Expectations

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

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
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**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

Table II-2 below shows the target allocation based on the Board's current policy along with the capital market assumptions provided by the Plan's investment consultant for 2016. We note that the assumptions provided by Verus were specific to their clients that were formerly serviced by Strategic Investment Solutions (SIS). Below we discuss our analysis of MCERA's portfolio based on an alternative set of capital market assumptions provided by Verus. Based on these assumptions, we calculated an expected geometric return of 7.25%, which is very close to the geometric return expectation provided by Verus for this portfolio (14.3%). This correlates to a 5.35% real expected return based on the Verus-SIS inflation assumption of 1.9%.

Table II-2

Verus-SIS 10-year Assumptions				
Asset Category	Target Allocation	Arithmetic Return	Geometric Return	Standard Deviation
US Large Cap	22.0%	8.3%	7.0%	16.5%
US Small Cap	5.0%	9.4%	7.5%	20.5%
International Stock	16.0%	9.9%	7.7%	22.0%
Emerging Market Equity	7.0%	14.2%	8.7%	36.0%
Private Equity	9.0%	13.9%	9.4%	33.0%
US Fixed Income	17.0%	2.8%	2.7%	5.0%
Bank Loans	5.0%	4.7%	4.4%	8.5%
Absolute Return	5.0%	6.4%	6.0%	9.0%
Infrastructure	3.0%	7.5%	5.5%	21.0%
Natural Resources	3.0%	10.1%	7.5%	24.0%
Real Estate	8.0%	7.0%	5.6%	17.0%
Total	100.0%	8.24%	7.25%	12.23%
Real Return		6.34%	5.35%	

We also reran the results using three other sets of capital market assumptions from different investment consultants - who were chosen because their published expectations included similar asset classes to those included in the MCERA portfolio - and using a broader survey of capital market assumptions conducted by Horizon Actuarial Services using 10 and 20-year expectations. As mentioned above, this includes an alternative set of assumptions provided by Verus for clients not related to the SIS merger. The results are shown in Table II-3 on the next page.

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**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

Table II-3

MercedCERA Portfolio Return Expectations				
Consultant	Nominal	Inflation	Real	Standard Deviation
Verus (Merced)	7.25%	1.90%	5.35%	14.79%
Callan	7.00%	2.25%	4.75%	15.07%
Marco	6.92%	2.20%	4.72%	11.51%
<u>Verus (Other)</u>	<u>7.04%</u>	<u>1.98%</u>	<u>5.06%</u>	<u>12.38%</u>
Average	6.98%	2.14%	4.84%	12.98%
Horizon (Survey, 10-year)	7.04%	2.16%	4.88%	12.64%
Horizon (Survey, 20-year)	7.99%	2.31%	5.68%	12.64%

The average geometric return over a 10-year period based on the other consultants' expectations was 6.98%, while the return from the Horizon surveys was even higher at 7.04% over 10 years and 7.99% over 20 years.

Based on each set of capital market assumptions, we also calculated the potential distribution of returns over 10-year periods as shown in Table II-4. The 50th percentile return under the Verus-SIS survey assumptions was 7.25%, which is the same as the 7.25% nominal return recently adopted by the Board. Using the Verus-SIS average inflation assumption (1.90%), this results in a 5.35% real return assumption.

In Table II-4, the median real return under the three other consultants of 4.84% is lower than that of Verus-SIS, but still higher than that recently adopted by the Board: 4.75%, based on a 7.25% nominal return and 2.50% price inflation.

Table II-4

Expected Distribution of Average Annual Passive Investment Returns				
Percentile	Verus (SIS-Merced)		Avg: Callan, Marco, Verus (Non-SIS)	
	Nominal	Real	Nominal	Real
95th	15.11%	13.21%	13.88%	11.73%
75th	10.40%	8.50%	9.76%	7.61%
50th	7.25%	5.35%	6.98%	4.84%
25th	4.18%	2.28%	4.28%	2.14%
5th	-0.08%	-1.98%	0.51%	-1.63%

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**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

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

The recently adopted discount rate of 7.25% is very close to the expectation under the long-term capital market assumptions of Verus-SIS (after adjustment for investment expenses), and the average expected real return for the MCERA target portfolio for the three other sets of capital market assumptions included in our analysis is also very close to the assumed real rate of 4.75% that was recently adopted. We therefore find the current discount rate to be a reasonable assumption. However, there are a number of factors that suggest that the near-term expected rate of return should be discussed.

- Many investment consultants expect poor rates of return in the immediate and near-term future. They reason that there is little in the way of yields on fixed income, and that the equity markets are fully valued.
- If much of the investment community is correct in their projections, we can expect returns below the 7.25% assumed rate for a number of years. This will result in actuarial losses and increases in employer contribution rates. However, these losses may be partially offset by gains on the liabilities from price and wage inflation below the assumed level (2.50% and 2.75%, respectively).
- We believe that near- and mid-term return projections should be considered along with long-term projections. Fund performance is usually measured over five to 10 years; longer measurement periods are often considered less relevant because of the potential for changes in the economy and in the investment markets.

We recommend that the Board and staff continue to conduct at least a brief discussion of this assumption annually, in consultation with the Plan's actuary and investment consultant, to determine if further changes are appropriate.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
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**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 are also considered a demographic assumption because the assumption is 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 non-inflationary pressures on base pay (such as productivity increases), and increases in individual pay due to merit, promotion, and longevity. Increases due to cost-of-living and non-inflationary base pay factors were addressed in an earlier section of this report.

The merit salary increase assumption is analyzed by employee group and by service. Generally, newer employees are more likely to earn a longevity increase or receive a promotion, so their salary increases tend to be greater than those for longer service employees. Two different approaches were used to analyze the merit increases: a *longitudinal* study and a *transverse* study.

A *longitudinal* study reviews the average increase in pay for each level of service. To analyze the merit component, we subtracted the Plan's real wage growth - as measured by the base wage increases reflected in the most recent collective bargaining agreements covering most employees - from the total pay increases experienced by each member during the experience study period. Longitudinal studies, which use changes in pay collected over several years need to consider the effects of inflation, collective bargaining, and management decisions during the term of the study in order to be reliable.

Charts III-1 and III-3 on the following pages analyze the pay patterns for General and Safety members, respectively. Our charts will generally show the current assumption (red line) compared to the actual experience (blue line) and the proposed assumption (green line).

In a *transverse* study, salaries are examined at one point in time (the valuation date), as opposed to being observed over a number of years under a longitudinal study. A transverse study serves as a reliable way to assess average increases in pay due to merit. With a homogeneous group of any size at all, the pattern of promotions and longevity increases during the career of an average employee is clearly visible in this analysis.

Charts III-2 and III-4 illustrate the results of the *transverse* study. It compares the current pay patterns for each group with current pay data. Only increases due to merit (longevity and promotion) are considered here. In the graphs, the average pay of the active General and Safety

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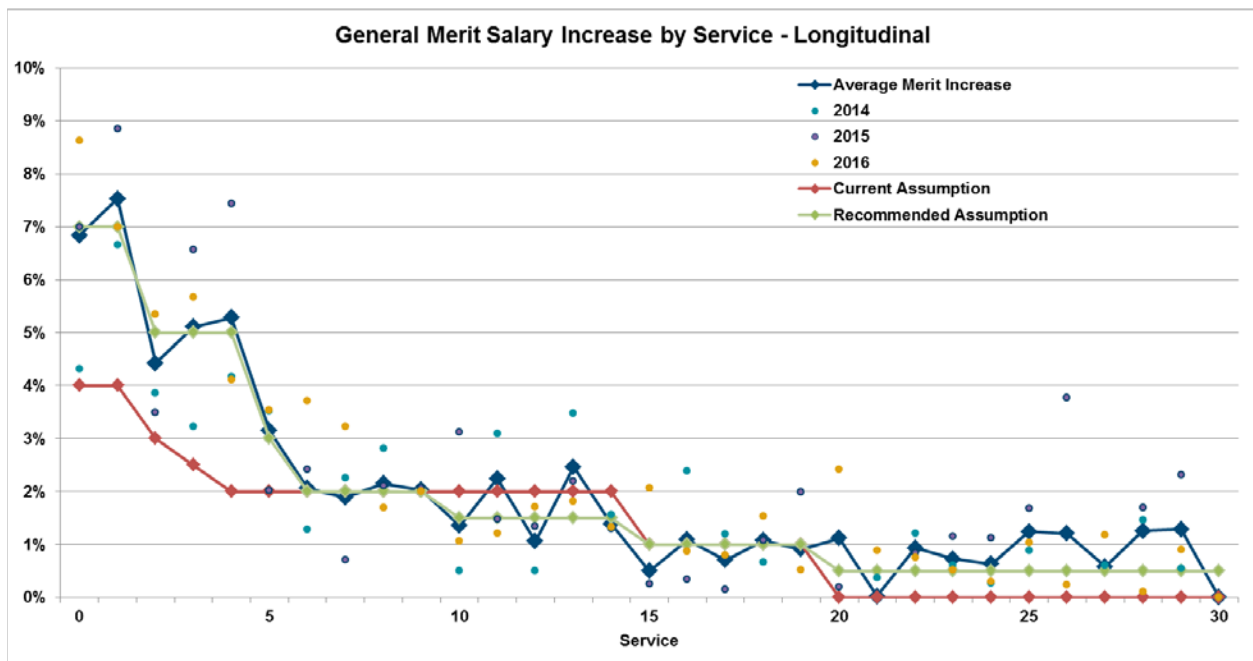
**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES**

members of June 30, 2016 is plotted against service. A curve is then fitted to the average pay data, and this curve is used to determine a pay increase due to merit.

In each chart, the current assumed pay increases due to merit are generally shown by the teal line and the proposed pay increases due to merit are shown by the purple line, while the blue diamonds represent the average pay at each year of service.

We recommend increasing the merit assumption for lower service points and the ultimate rate, and reducing the merit assumption for mid service points for both General and Safety.

Chart III-1: General



MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Chart III-2: General

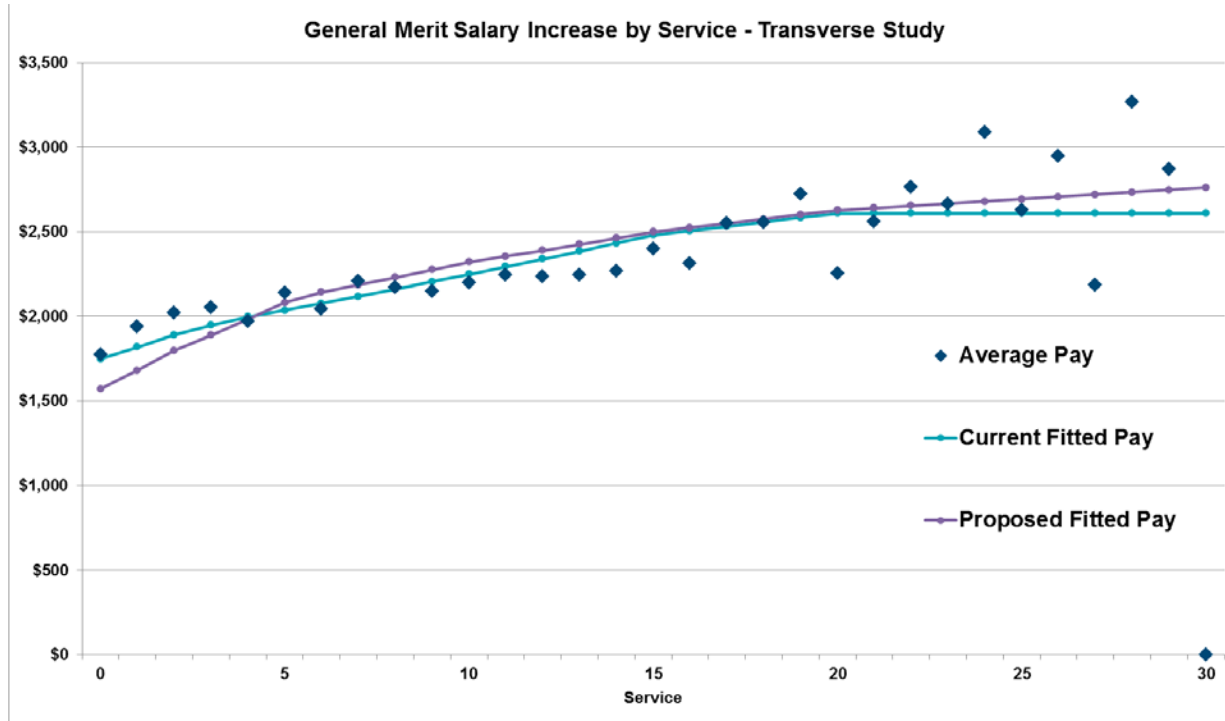
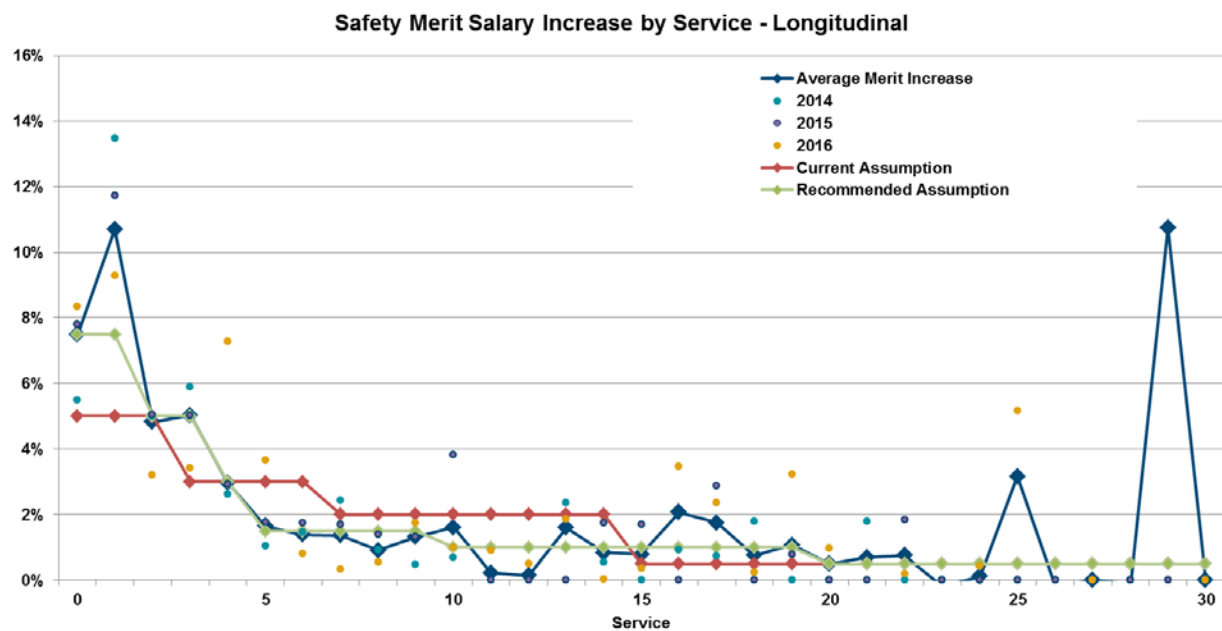


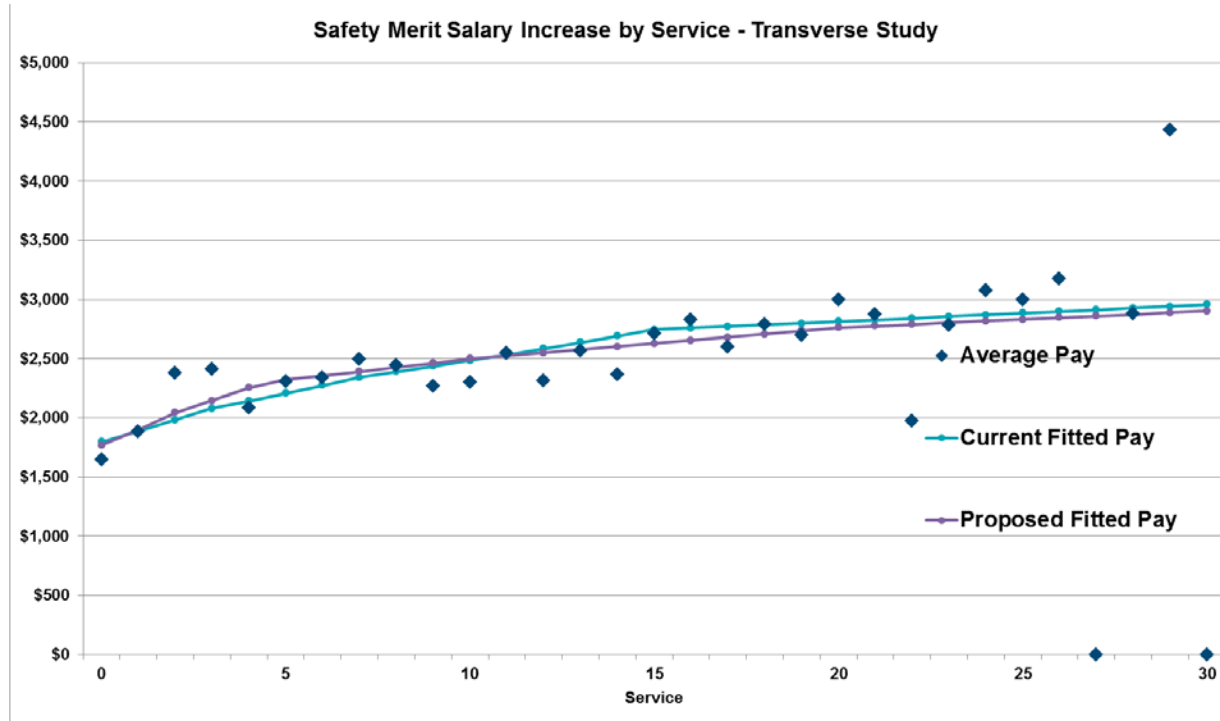
Chart III-3: Safety



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

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

Chart III-4: Safety



TERMINAL (VENTURA) PAY LOAD

Under the Ventura Settlement, members have been able to cash out some or all of their leave time (up to 160 hours) in the year prior to retirement; the cashed out pay was then included in the members' final average compensation.

The current actuarial assumptions include a load of 6.92% for Tier 1 members and 2.31% for Tier 2 members to Final Average Compensation to account for this cash out. This is equivalent to assuming that members will cash out 90% of the maximum allowable time in the year of retirement: $90\% \times 160 \text{ hours} / 2080 \text{ hours worked per year} = 6.92\%$ for Tier 1. The load is divided by 3 for Tier 2 ($6.92\% / 3 = 2.31\%$) to account for the fact that these members use three year averaging for their final compensation.

MCERA staff informed Cheiron that the cash-outs are no longer included in the Final Average Compensation calculation starting July of 2014.

We performed an analysis of the retirement calculations which occurred between July 1, 2013 and June 30, 2016. Data showed that cash-outs averaged 6.2% for Tier 1 and 1.9% for Tier 2 for the fiscal year ending 2014. There were no cash-outs for the fiscal years ending 2015 and 2016.

We recommend eliminating the load on Final Average Compensation for all tiers.

SECTION III – DEMOGRAPHIC ASSUMPTIONS

ANALYSIS OF OTHER DEMOGRAPHIC ASSUMPTIONS

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

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

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

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

RETIREMENT RATES

The current retirement rates vary by group, gender, 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 three-year period in order to have a more robust dataset to review.

Generally, at any given age, members with more service are generally 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 separate assumptions by age for the following service groups for General members; 1) members with 10-19 years of service, 2) members with 20-29 years of service, and 3) members with 30 or more years of service. We continued to find that retirement rates are materially different between males and females for General members, so we recommend keeping separate rates by gender.

We recommend separate assumptions by age for the following two service groups for Safety members; 1) members with less than 20 years of service and 2) members with 20 or more years of service.

We recommend the continued use of the same assumptions for all PEPRA members as the other members since we do not yet have any plan experience to support a different set of assumptions. There is some expectation that PEPRA members may retire later than those in other tiers due to their lower benefit levels. However, there is no data yet that exists regarding these members' retirement behavior and our initial analysis of the PEPRA normal cost rates showed little impact if the retirement rates were adjusted to assume later retirements.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

Table III-R1 shows the calculation of actual-to-expected ratios and the r-squared statistic for General male members with 10 to 19 years of service. Chart III-R1 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 86% to 92%. The r-squared increases from 0.64 to 0.69.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

Table III-R1 – General Male

Retirement Rates - General - Male, 10 to 19 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	119	3	5	6	61%	50%
55 - 59	196	20	15	20	130%	102%
60 - 64	118	24	30	24	81%	102%
65 - 69	32	10	15	11	65%	89%
70+	5	3	5	5	60%	60%
Total	470	60	70	65	86%	92%
R-squared			0.6429	0.6930		

Chart III-R1 – General Male



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

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

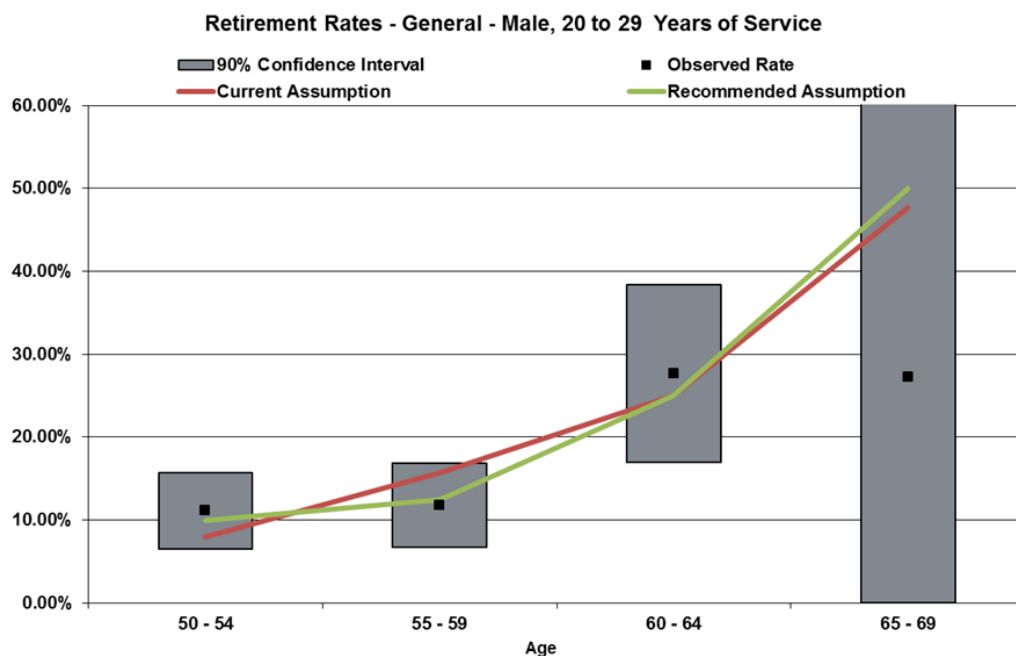
The data shows actual retirement rates that are close to expected in aggregate under the current assumption. We recommend only modest changes to these retirement rates at this time. The proposed assumption does not change the overall assumed rate of retirement and increases the aggregate A/E ratio from 97% to 99%. The r-squared increases from 0.39 to 0.56.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

Table III-R2 – General Male

Retirement Rates - General - Male, 20 to 29 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	126	14	10	13	140%	111%
55 - 59	110	13	17	14	75%	95%
60 - 64	47	13	12	12	111%	111%
65 - 69	11	3	5	6	57%	55%
70+	-	-	-	-	0%	0%
Total	294	43	44	44	97%	99%
R-squared			0.3885	0.5589		

Chart III-R2 – General



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

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

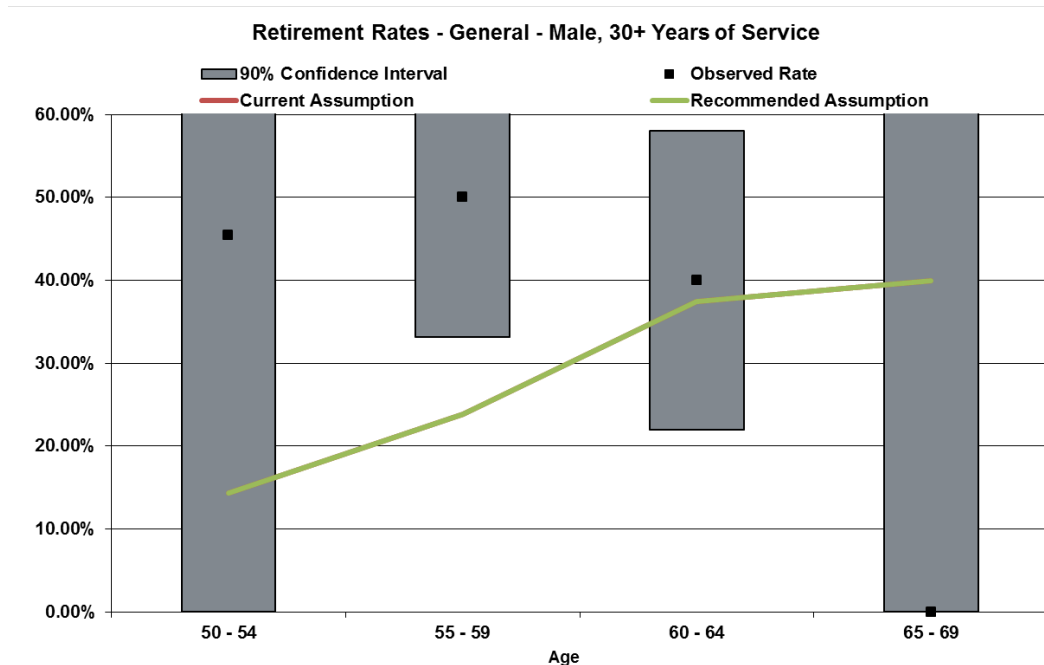
The data shows higher actual retirement rates than expected under the current assumption. However, there is not enough experience to justify a proposed change in assumption, especially given that a set of assumptions based on the actual data would imply a probability of retirement that declines with age, which doesn't reflect the pattern anticipated for this assumption.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

Table III-R3 – General Male

Retirement Rates - General - Male, 30+ Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	11	5	2	2	317%	317%
55 - 59	24	12	6	6	210%	210%
60 - 64	20	8	8	8	107%	107%
65 - 69	1	-	0	0	0%	0%
70+	-	-	-	-	0%	0%
Total	56	25	15	15	165%	165%
R-squared			0.5969	0.5969		

Chart III-R3 – General Male



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

Table III-R4 shows the calculation of actual-to-expected ratios and the r-squared statistic for General female members with 10 to 19 or more years of service. Chart III-R4 shows the information graphically along with the 90% confidence interval.

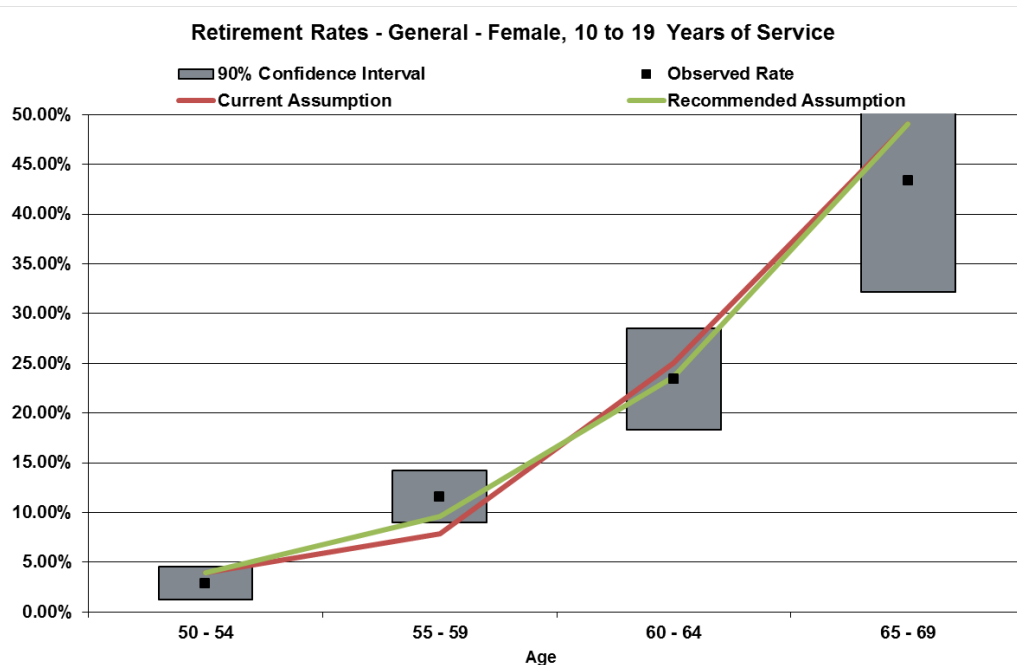
The data shows actual retirement rates that are close to expected in aggregate under the current assumption. We recommend only modest changes to these retirement rates at this time. The proposed assumption slightly increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio. The r-squared increases from 0.55 to 0.75.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

Table III-R4 – General Female

Retirement Rates - General - Female, 10 to 19 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	278	8	11	11	72%	72%
55 - 59	414	48	33	40	147%	121%
60 - 64	188	44	47	44	94%	99%
65 - 69	53	23	26	26	88%	88%
70+	7	2	7	7	29%	29%
Total	940	125	124	128	101%	97%
R-squared			0.5481	0.7533		

Chart III-R4 – General Female



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

Table III-R5 shows the calculation of actual-to-expected ratios and the r-squared statistic for General female members with 20 to 29 years of service. Chart III-R5 shows the information graphically along with the 90% confidence interval.

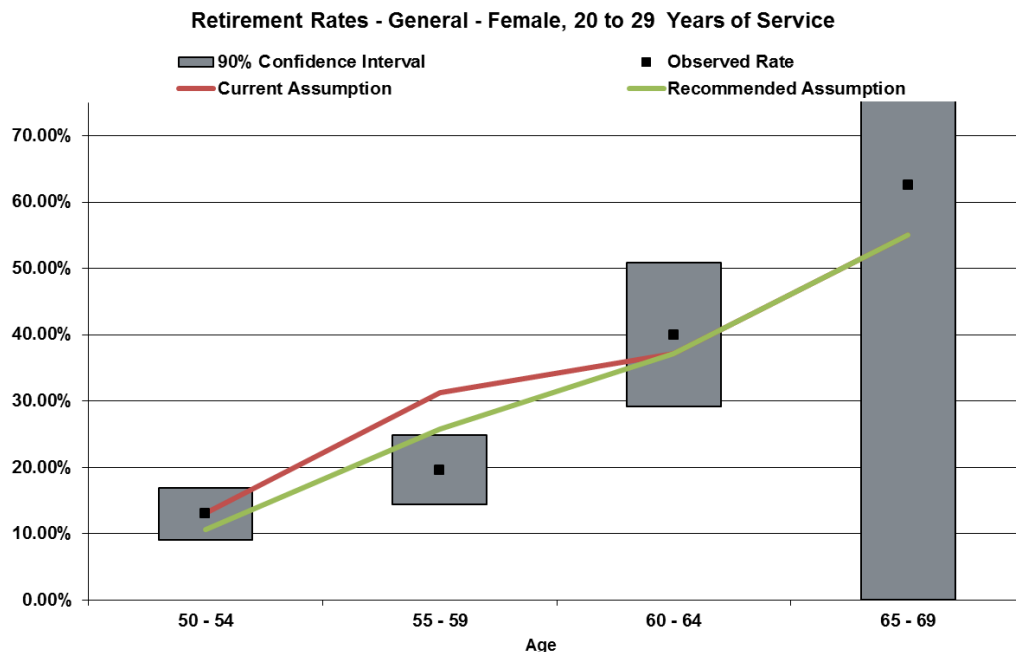
The data shows lower actual retirement rates than expected under the current assumption. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 84% to 97%. The r-squared also increases from 0.59 to 0.69.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

Table III-R5 – General Female

Retirement Rates - General - Female, 20 to 29 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	200	26	26	21	99%	123%
55 - 59	158	31	49	41	63%	76%
60 - 64	55	22	20	20	108%	108%
65 - 69	8	5	4	4	114%	114%
70+	-	-	-	-	0%	0%
Total	421	84	100	87	84%	97%
R-squared			0.5923	0.6894		

Chart III-R5 – General Female



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

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

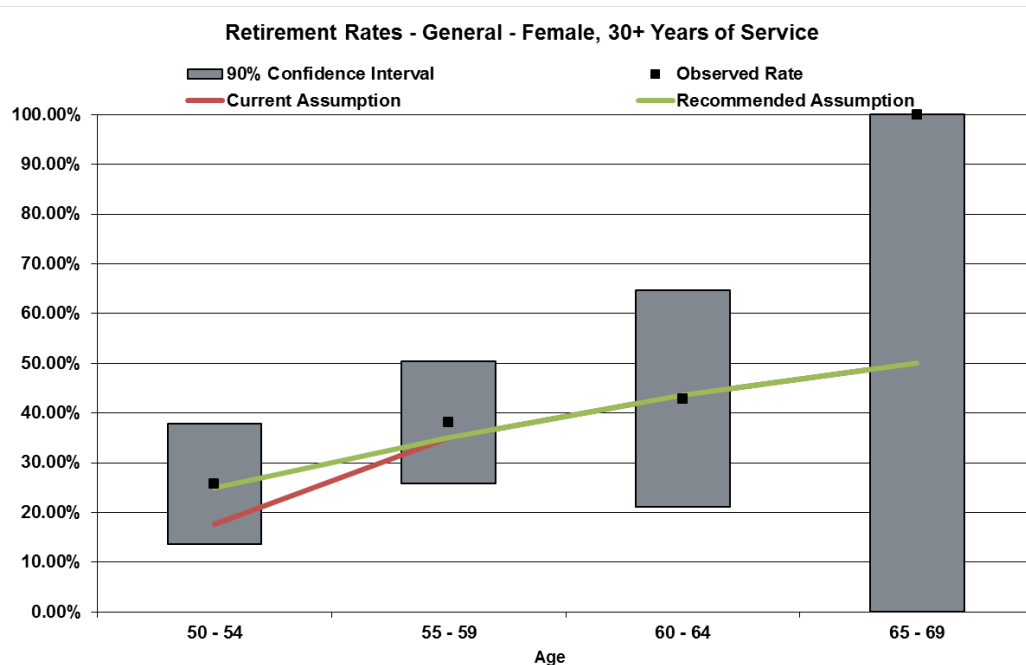
The data shows higher actual retirement rates than expected under the current assumption. The proposed assumption increases the aggregate assumed rate of retirement for ages less than 55 and decreases the aggregate A/E ratio from 116% to 106%. The r-squared increases from 0.56 to 0.59.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 70.

Table III-R6 – General Female

Retirement Rates - General - Female, 30+ Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	35	9	6	9	145%	103%
55 - 59	42	16	15	15	109%	109%
60 - 64	14	6	6	6	98%	98%
65 - 69	1	1	1	1	200%	200%
70+	-	-	-	-	0%	0%
Total	92	32	28	30	116%	106%
R-squared			0.5563	0.5876		

Chart III-R6 – General Female



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**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 10 to 19 years of service. Chart III-R7 shows the information graphically along with the 90% confidence interval.

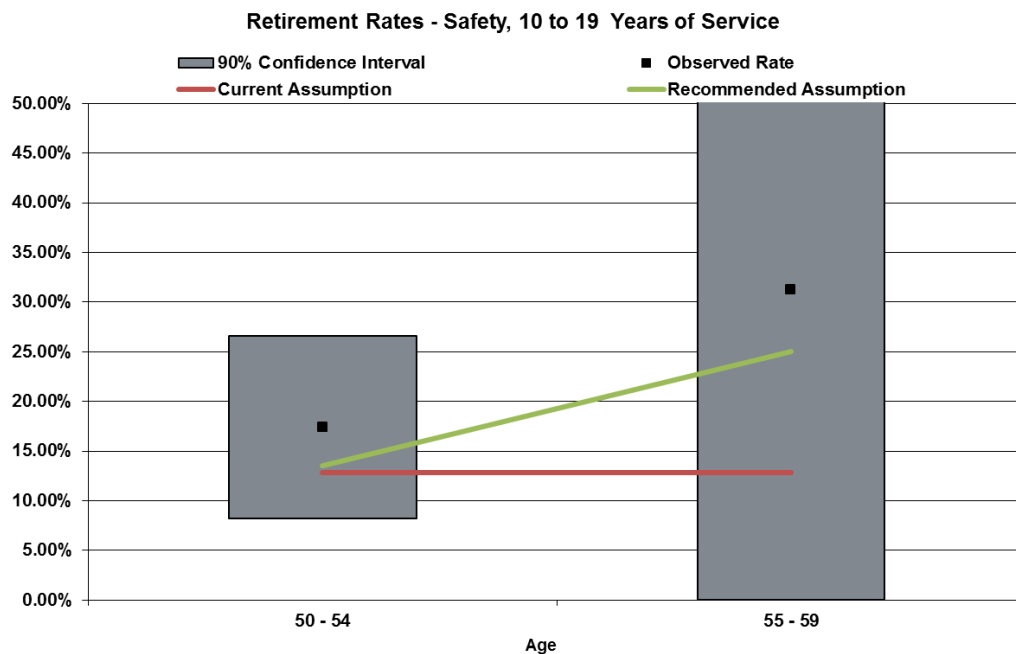
The data shows higher actual retirement rates than expected under the current assumption. The proposed assumption increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio from 151% to 123%. The r-squared increases from 0.52 to 0.63.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 60.

Table III-R7 – Safety

Retirement Rates - Safety, 10 to 19 Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	46	8	6	6	136%	128%
55 - 59	16	5	2	4	244%	125%
60 - 64	2	2	2	2	100%	100%
65 - 69	-	-	-	-	0%	0%
70+	-	-	-	-	0%	0%
Total	64	15	10	12	151%	123%
R-squared			0.5244	0.6255		

Chart III-R7 – Safety



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**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 20+ years of service. Chart III-R8 shows the information graphically along with the 90% confidence interval.

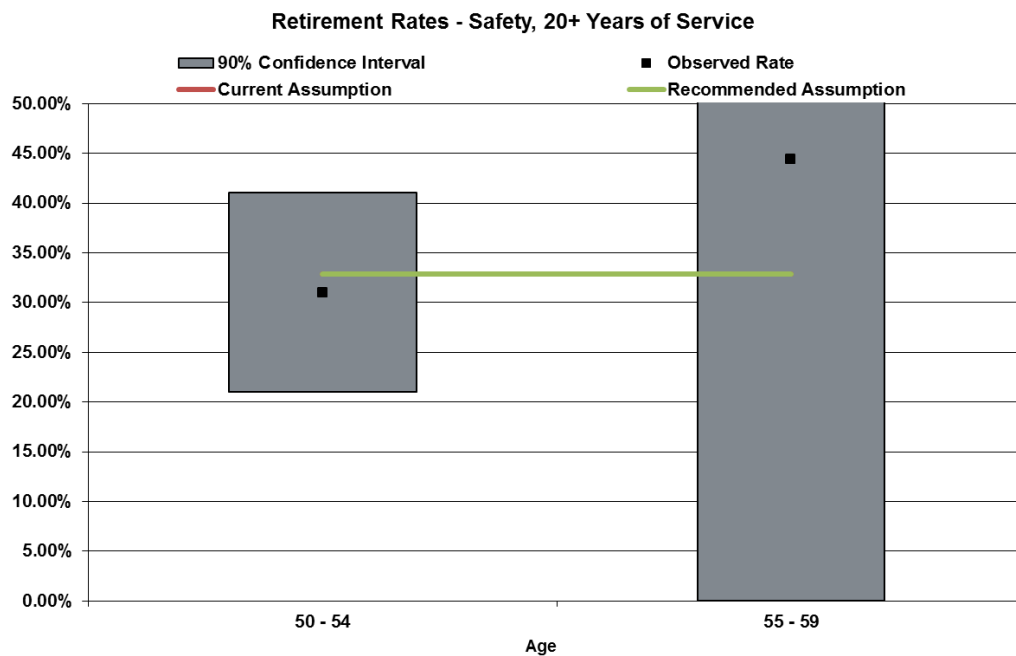
The data shows actual retirement rates that are close to expected in aggregate under the current assumption. There is not enough experience to justify a proposed change in assumptions.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 60.

Table III-R8 – Safety

Retirement Rates - Safety, 20+ Years of Service						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
50 - 54	58	18	19	19	94%	94%
55 - 59	9	4	3	3	135%	135%
60 - 64	-	-	-	-	0%	0%
65 - 69	-	-	-	-	0%	0%
70+	-	-	-	-	0%	0%
Total	67	22	22	22	100%	100%
R-squared			0.9444	0.9444		

Chart III-R8 – Safety



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Termination rates reflect the frequency at which active members leave employment for reasons other than retirement, death, or disability. Currently, the termination rates are based on service for both Safety and General members. We have found that the rate of termination is more related to years of service rather than age. This methodology also avoids under-weighting the liabilities that can occur if using age-based rates only. The termination rates do not apply once members are eligible for a service retirement benefit. Again, 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.

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.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Table III-T1 shows the calculation of actual-to-expected ratios and the r-squared statistic for General male members, and Chart III-T1 shows the information graphically along with the 90% confidence interval.

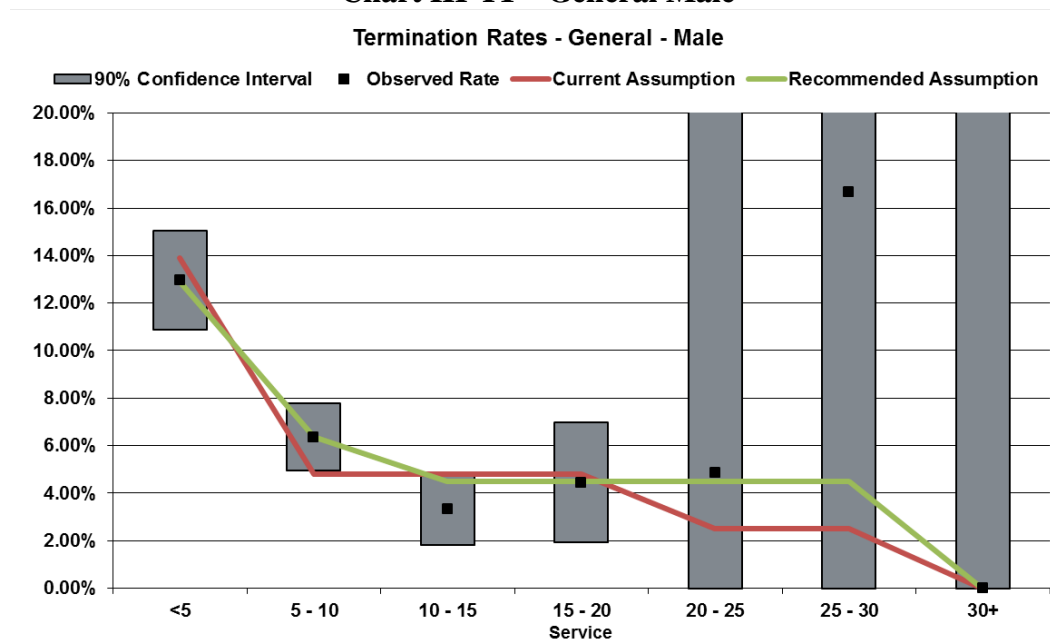
The data shows higher actual termination rates than expected under the current assumption. The proposed assumption increases the aggregate assumed rates of termination and decreases the aggregate A/E ratio from 102% to 99%. The r-squared increases from 0.94 to 0.96.

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

Table III-T1 – General Male

Termination Rates - General - Male						
Service	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
<5	710	92	99	92	93%	101%
5 - 10	817	52	39	52	133%	100%
10 - 15	392	13	19	18	69%	74%
15 - 20	180	8	9	8	93%	99%
20 - 25	82	4	2	4	195%	108%
25 - 30	18	3	0	1	667%	370%
30+	-	-	-	-	0%	0%
Total	2,199	172	168	174	102%	99%
R-squared			0.9362	0.9600		

Chart III-T1 – General Male



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

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

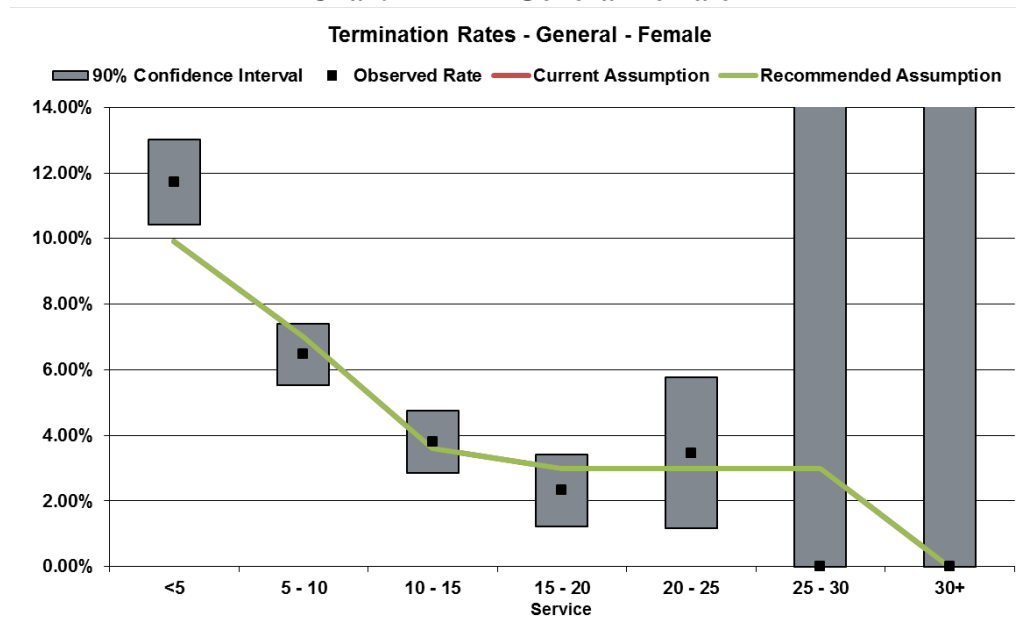
The data shows that actual termination rates are slightly higher in aggregate, but the r-squared is 0.96 and the A/E ratio is 105%, therefore we are comfortable recommending no change to the assumption.

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

Table III-T2 – General Female

Termination Rates - General - Female						
Service	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
<5	1,680	197	167	167	118%	118%
5 - 10	1,839	119	129	129	93%	93%
10 - 15	1,104	42	40	40	106%	106%
15 - 20	516	12	15	15	78%	78%
20 - 25	173	6	5	5	116%	116%
25 - 30	49	-	1	1	0%	0%
30+	-	-	-	-	0%	0%
Total	5,361	376	357	357	105%	105%
R-squared			0.9644	0.9644		

Chart III-T2 – General Female



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Table III-T3 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart III-T3 shows the information graphically along with the 90% confidence interval.

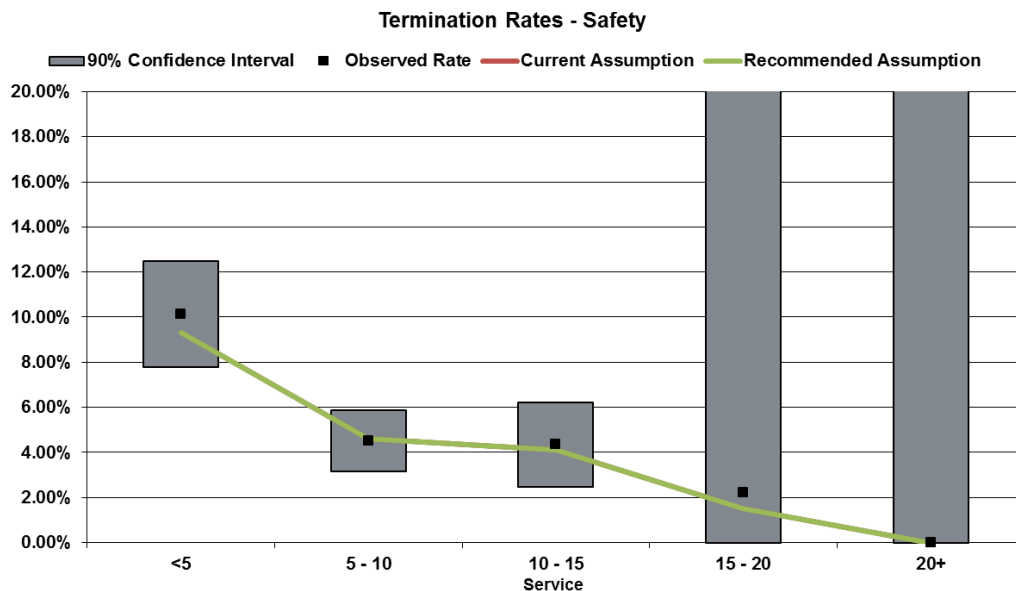
The data shows that actual termination rates are slightly higher in aggregate, but the r-squared is 0.89 and the A/E ratio is 106%, therefore we are comfortable recommending no change to the assumption.

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

Table III-T3 – Safety

Termination Rates - Safety						
Service	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
<5	444	45	41	41	109%	109%
5 - 10	643	29	30	30	98%	98%
10 - 15	322	14	13	13	106%	106%
15 - 20	179	4	3	3	147%	147%
20+	-	-	-	-	0%	0%
Total	1,588	92	87	87	106%	106%
R-squared			0.8911	0.8911		

Chart III-T3 – Safety



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**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 employees' retirement benefit is based on the employee's service with MCERA and Final Compensation based on employment with the reciprocal employer.

Table III-T4 and III-T5 show the results of our analysis of terminations for General and Safety members, as well as our recommendations regarding rates of withdrawal, vested termination, and transfer.

Table III-T4 – General

Types of Termination for General Members			
Service and Type	Actual	Expected	Recommended
0-4 Years of Service			
Withdrawal	92.50%	90.00%	90.00%
Transfer	6.07%	10.00%	10.00%
Vested Termination	0.00%	0.00%	0.00%
5-14 Years of Service			
Withdrawal	38.58%	40.00%	40.00%
Transfer	9.50%	12.00%	10.00%
Vested Termination	51.93%	48.00%	50.00%
15+ Years of Service			
Withdrawal	10.87%	10.00%	10.00%
Transfer	10.87%	10.00%	10.00%
Vested Termination	78.26%	80.00%	80.00%

Table III-T5 – Safety

Types of Termination for Safety Members			
Service and Type	Actual	Expected	Recommended
0-4 Years of Service			
Withdrawal	90.43%	90.00%	90.00%
Transfer	9.57%	10.00%	10.00%
Vested Termination	0.00%	0.00%	0.00%
5+ Years of Service			
Withdrawal	29.69%	15.00%	30.00%
Transfer	26.56%	42.50%	25.00%
Vested Termination	43.75%	42.50%	45.00%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

DEFERRED RETIREMENT COMMENCEMENT AGE

The current assumption is that all General terminated vested members and transfers will retire at age 59, and all Safety terminated vested members and transfers will retire at age 53. We recommend splitting the assumption between terminated vested members and transfers. The table below shows the results of our analysis and our recommendations regarding the expected retirement age.

Table III-T6

Deferred Retirement Commencement Age			
	Actual Average	Expected	Recommended
General			
Terminated Vested	58.89	59.00	59.00
Transfer	60.78	59.00	61.00
Safety			
Terminated Vested	53.80	53.00	53.00
Transfer	55.03	53.00	55.00

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 3.25% for General and Safety members.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

This section analyzes the incidence of disability by the age of the employee. All disabilities for members with less than five years of service are assumed to be service-related. The amount of disability experience is fairly limited; only 14 disabilities have occurred during the last three years for Safety and General members combined. To improve the credibility of the data, we have aggregated the experience of the past three years with that of the prior experience study (2010-2013).

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

The data shows that actual disability rates are close to expected disability rates in aggregate. Cheiron recommends no changes to these termination rates due to a lack of credible experience.

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

Table III-D1 – General Male

Disability Rates - General - Male						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
<20	-	-	-	-	0%	0%
20 - 29	187	-	0	0	0%	0%
30 - 39	703	-	1	1	0%	0%
40 - 49	768	1	1	1	77%	77%
50 - 59	1,015	5	3	3	170%	170%
60 - 69	83	-	0	0	0%	0%
70+	-	-	-	-	0%	0%
Total	2,756	6	5	5	115%	115%
R-squared			0.1074	0.1074		

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

Chart III-D1 – General Male

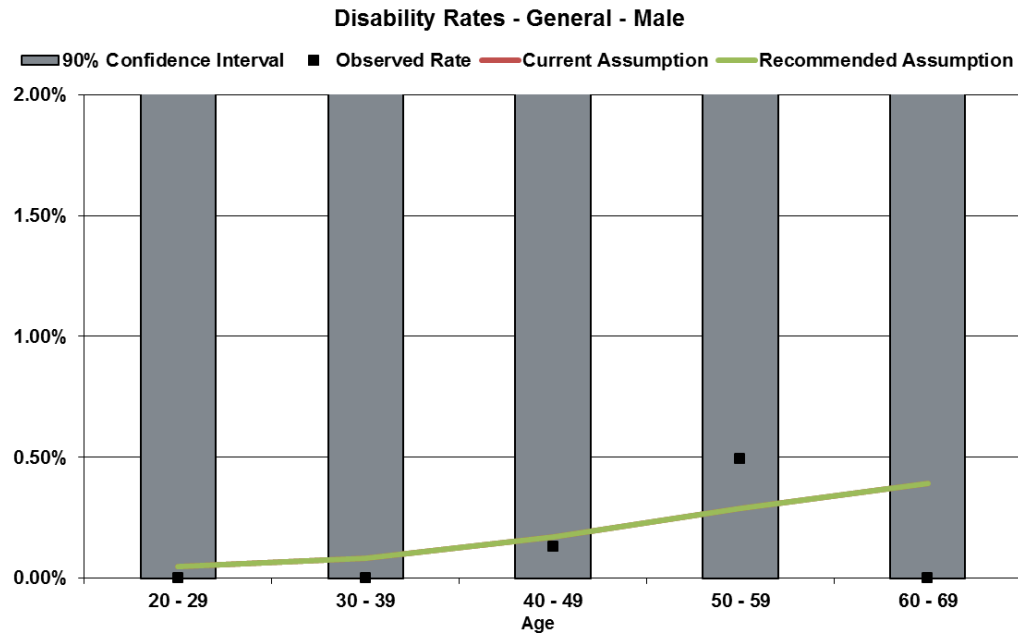


Table III-D2 shows the calculation of actual-to-expected ratios and the r-squared statistic for all disabilities for General female members, and Chart III-D2 shows the information graphically.

The data shows that actual disability rates are higher than the expected disability rates in aggregate, Cheiron recommends no changes to these termination rates due to a lack of credible experience.

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

Table III-D2 – General Female

Disability Rates - General - Female						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
<20	71	-	0	0	0%	0%
20 - 29	519	-	0	0	0%	0%
30 - 39	975	-	0	0	0%	0%
40 - 49	984	-	0	0	0%	0%
50 - 59	937	2	0	0	489%	489%
60 - 69	915	2	1	1	262%	262%
70+	1,097	2	2	2	122%	122%
Total	5,498	6	3	3	181%	181%
R-squared			0.1375	0.1375		

MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016

SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES

Chart III-D2 – General Female

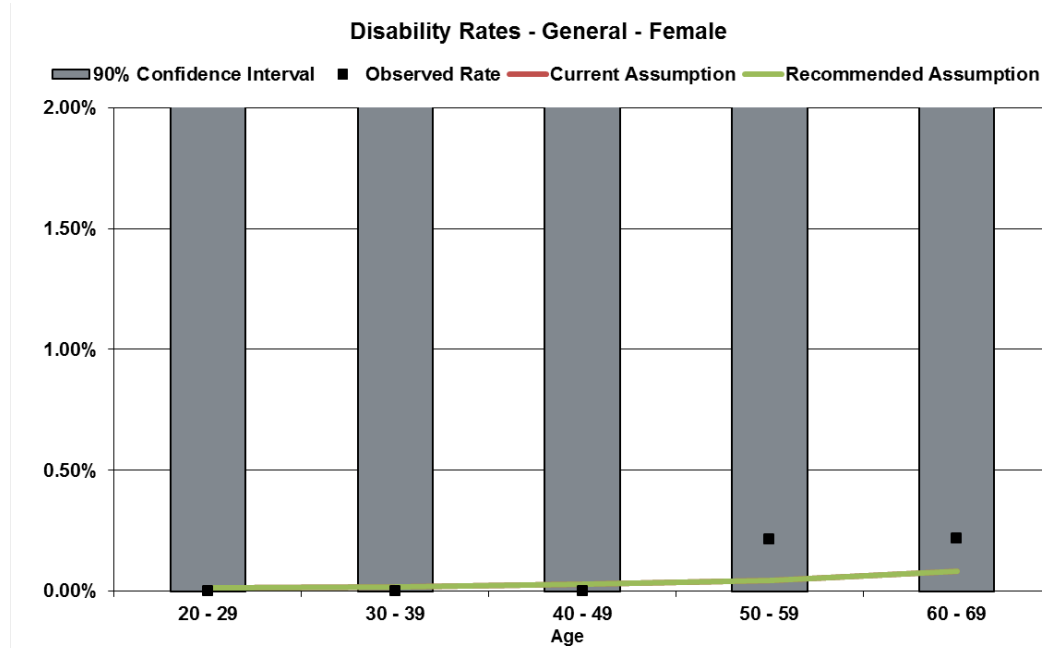


Table III-D3 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart III-D3 shows the information graphically.

The data shows that the number of disabilities is slightly lower than the number expected under the current assumption. As with the General members, the amount of experience upon which to base credible assumptions is limited. However, we do expect that the underlying rate of disability should increase with age, which is not reflected in the current assumptions above age 59, and therefore we have proposed a set of alternative rates based on the most recent CalPERS experience study. We recommend changing the rates to be 50% of the CalPERS industrial disability rates for Police for duty-related disabilities and 50% of the CalPERS non-industrial disability rates for Police for non-duty related disabilities. In aggregate, the proposed assumptions decrease the assumed rates of disability and increases the aggregate A/E ratio from 80% to 93%. The r-squared also increases from 0.063 to 0.087.

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

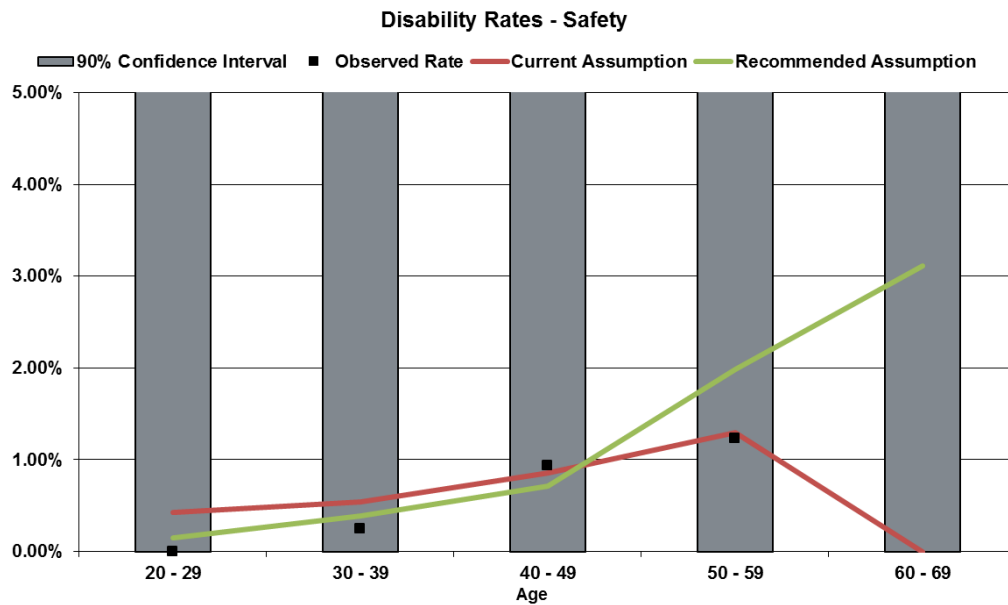
**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

Table III-D3 - Safety

Disability Rates - Safety						
Age	Exposures	Retirements			Actual to Expected Ratios	
		Actual	Current	Recommended	Current	Recommended
<20	-	-	-	-	0%	0%
20 - 29	327	-	1	0	0%	0%
30 - 39	801	2	4	3	46%	65%
40 - 49	535	5	5	4	109%	131%
50 - 59	162	2	2	3	95%	62%
60 - 69	6	1	-	0	0%	536%
70+	-	-	-	-	0%	0%
Total	1,831	10	12	11	80%	93%
R-squared			0.0630	0.0868		

Chart III-D2 - Safety



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

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

The Society of Actuaries recently completed an extensive mortality study and updated their mortality tables and mortality improvement projection scale, the most recent of which is named the MP-2016 scale. CalPERS also recently released a set of mortality tables based on California public plan experience. We used these tables as the basis for our analysis.

The steps in our analysis are as follows:

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

As we have done in prior experience studies, we have combined the experience of the past three years with that of the two prior three-year periods in order to have a more robust dataset to review.

Historically we have proposed assumption changes when the Actual-to-Expected (A/E) ratio for the current assumption is less than 100%. However, beginning with the 2010-2013 Experience Study, we recommended a change in this approach going forward, where the proposed assumptions are intended to track closely to actual experience (i.e., an A/E ratio close to 100%, but with a ratio slightly less than 100% still being reasonable). However, as described below, this approach also includes an expectation that the assumed mortality rates will automatically become more conservative each year, since the actual mortality rates are also expected to decrease over time.

We also historically recommended the same or a related table for active employees and healthy annuitants, which has been the current practice for MCERA. However, recent mortality studies by the Society of Actuaries and others have shown significantly lower rates of mortality for active employees versus those of the same age who are no longer working, therefore this year we have suggested using separate tables for active versus retired members. In addition, we recommend continuing the current practice of using the same assumptions for General and Safety members, as the experience for the Safety members is quite limited.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

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

Healthy active members, retirees, and beneficiaries

- The sex distinct Retired Pensioners (RP) 2000 Combined Healthy Tables, published by the Society of Actuaries, projected to 2027 using Projection Scale BB.

Disabled members

- The sex distinct Retired Pensioners (RP) 2000 Combined Healthy Tables, published by the Society of Actuaries, projected to 2027 using Projection Scale BB, set forward three years for males and females

Since the prior study, the Society of Actuaries' Retirement Plans Experience Committee (RPEC) has released a new mortality improvement scale, Scale MP-2016, which reflects more up-to-date data than was used in the development of Scale BB.

MP-2016 represents the Society of Actuaries' most advanced actuarial methodology in incorporating mortality improvement trends with actual recent mortality rates, by using rates that vary not only by age but also by calendar year – known as a two-dimensional approach to projecting mortality improvements. Scale MP-2016 was 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.

This is a different approach from building in a margin for conservatism in the current rates to account for the expectation that the same rates will be applied in future years, when mortality experience has improved. Recent reports issued by RPEC suggest that using generational mortality is a preferable approach, as it allows for an explicit declaration of the amount of future mortality improvement included in the assumptions.

RPEC has also recently released a new set of base mortality rate tables – the RP-2014 tables, which are intended to replace the RP-2000 tables and are based on a recent study of US defined benefit plan mortality experience. However, RPEC excluded all public pension plan data in the construction of these tables – including a large amount of California public sector data – because there were significant differences between the private and public sector retirement experience, and the new tables are expected to be used by private sector plans to meet accounting and federal funding requirements specific to private plans.

Fortunately, there are alternative sets of assumptions that have been developed that may serve as a logical basis for developing mortality assumptions for MCERA. As part of an Experience Study completed in 2014, CalPERS adopted a new set of mortality tables for active, retired, and disabled members. MCERA's experience over the past nine years matches well with the new CalPERS rates, after removing the improvement projections included by CalPERS and replacing them with the new MP-2016 mortality improvement projections through the mid-point of each of the three three-year periods (2007-2010, 2010-2013, and 2013-2016).

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Even with the use of nine years of data (2007-2016), the MCERA experience is only partially credible, based on standard statistical theory. However, the CalPERS base tables provide a reasonable fit to MCERA's data with a 97% actual-to-expected ratio for males and a 94% actual-to-expected ratio for females, so we are not recommending any adjustments to the CalPERS base tables.

Rather than weighting the experience based on the number of members living and dying, we have weighted the experience based on benefit size. 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.

Based on this information, we are recommending the following base mortality table assumptions:

Active members

- CalPERS 2009 Non-Industrial Employees Mortality Table, with no adjustment.
- CalPERS 2009 Industrial Employee Mortality, with no adjustment (Line-of-Duty, Safety only).

Healthy retirees and beneficiaries

- CalPERS 2009 Healthy Annuitant Mortality Table, with no adjustment.

Disabled members

- CalPERS 2009 Industrial Disability Mortality Table.

We also recommend projecting these base tables generationally using the MP-2016 mortality improvement scale described above for all types of mortality.

As shown in Tables III-M1 and III-M2 on the following pages, our proposed mortality rates for healthy annuitants are slightly higher than recent experience (reflecting an A/E ratio of 97% and 94% respectively). We are comfortable that the ratio of actual to expected deaths is less than 100%, since the mortality tables recommended are consistent with the mortality experience for similar 1937 Act systems.

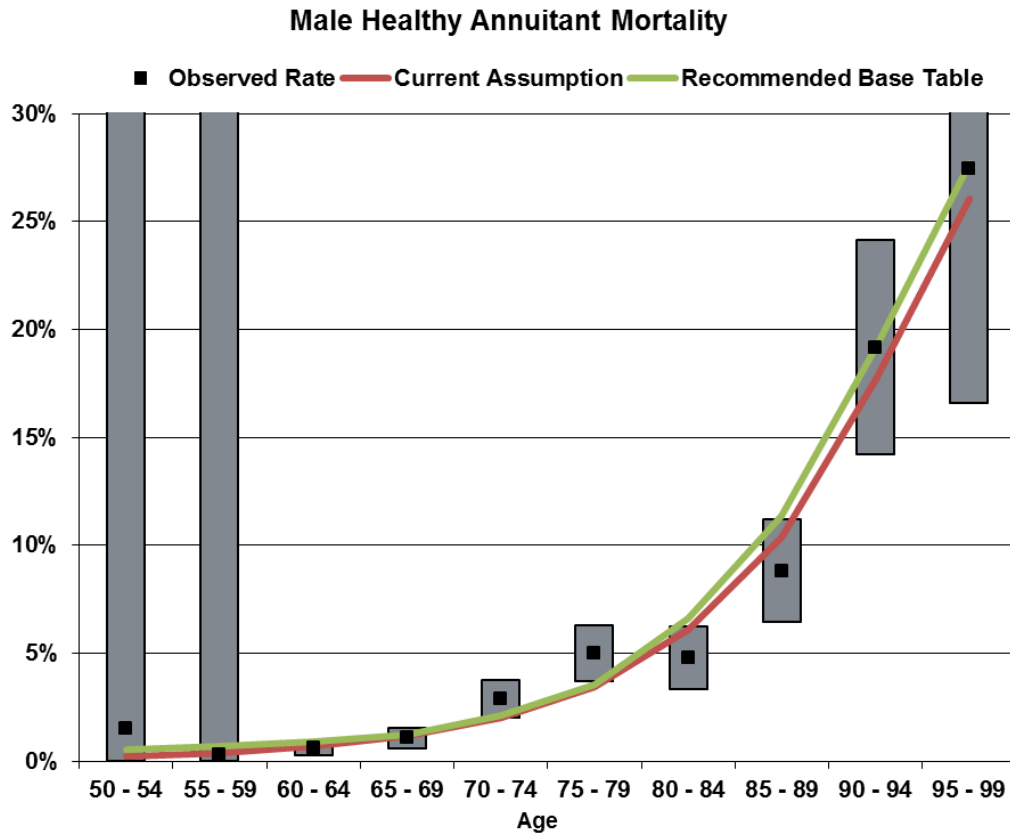
**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Table III-M1

Healthy Annuitant Mortality - Base Table for Males										
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths				Actual to Expected Ratios		
				Actual	Current	Standard	Recommended	Current	Standard	Recommended
50 - 54	262	5	679,791	10,423	1,573	3,761	3,761	663%	277%	277%
55 - 59	690	4	2,005,855	6,433	7,811	13,732	13,732	82%	47%	47%
60 - 64	1,274	8	4,363,316	26,930	30,136	39,691	39,691	89%	68%	68%
65 - 69	1,286	14	4,018,745	43,760	47,416	50,115	50,115	92%	87%	87%
70 - 74	1,029	28	2,611,689	75,641	53,324	55,771	55,771	142%	136%	136%
75 - 79	767	39	1,437,464	71,573	49,802	51,063	51,063	144%	140%	140%
80 - 84	580	34	976,838	46,970	59,491	64,649	64,649	79%	73%	73%
85 - 89	382	34	664,432	58,667	69,021	75,498	75,498	85%	78%	78%
90 - 94	171	34	307,579	58,978	54,415	58,947	58,947	108%	100%	100%
95 - 99	46	14	73,600	20,195	19,160	20,365	20,365	105%	99%	99%
100 +	2	-	424	-	135	139	139	0%	0%	0%
Total	6,489	214	17,139,734	419,570	392,284	433,732	433,732	107%	97%	97%

Chart III-M1



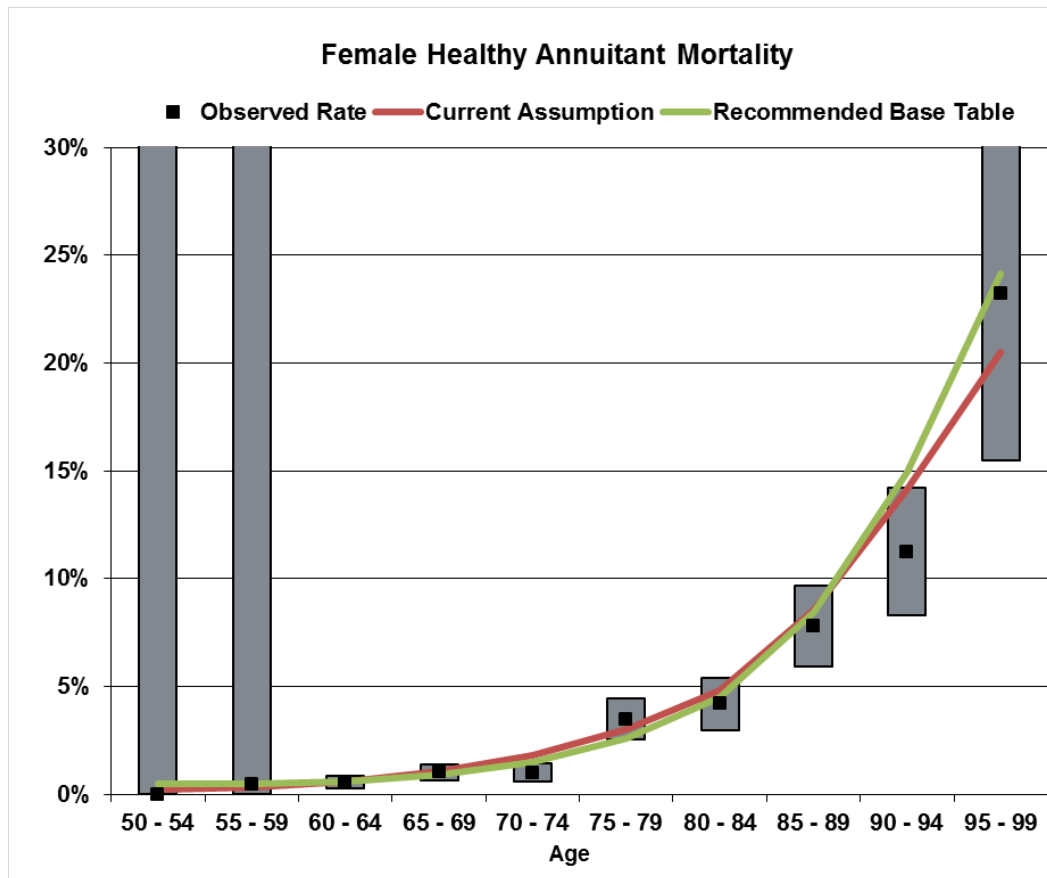
**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Table III-M2

Healthy Annuitant Mortality - Base Table for Females										
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths				Actual to Expected Ratios		
				Actual	Current	Standard	Recommended	Current	Standard	Recommended
50 - 54	305	-	505,799	-	1,018	2,529	2,529	0%	0%	0%
55 - 59	997	5	2,158,290	9,954	7,055	10,145	10,145	141%	98%	98%
60 - 64	1,733	13	3,633,956	20,070	21,565	21,607	21,607	93%	93%	93%
65 - 69	1,921	16	3,492,916	35,704	36,719	31,079	31,079	97%	115%	115%
70 - 74	1,461	18	2,218,296	22,402	39,860	33,425	33,425	56%	67%	67%
75 - 79	1,029	36	1,536,139	53,638	46,283	40,348	40,348	116%	133%	133%
80 - 84	733	32	968,784	40,627	46,887	43,366	43,366	87%	94%	94%
85 - 89	556	41	599,637	46,706	51,286	50,875	50,875	91%	92%	92%
90 - 94	307	38	290,051	32,659	41,100	43,413	43,413	79%	75%	75%
95 - 99	80	23	110,170	25,587	22,603	26,614	26,614	113%	96%	96%
100 +	4	1	6,470	1,026	1,417	1,980	1,980	72%	52%	52%
Total	9,126	223	15,520,508	288,372	315,792	305,381	305,381	91%	94%	94%

Chart III-M2



**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

We have not shown the data for the disabled and active member mortality experience, as the number of deaths is very low – 13 total disabled deaths and six total active deaths – over the nine-year period, which is not enough data to produce sufficiently credible assumptions. We have used our professional judgement to recommend appropriate base tables based on the CalPERS rates, and applied the same generational improvement scales as recommended for the service-retired members.

Mortality Assumptions for Employee Contribution Rates

For purposes of determining employee contribution rates, the use of generational mortality improvements is impractical from an administrative perspective. Therefore, we recommend using the base mortality tables described above (various CalPERS tables) projected using Scale MP-2016 from 2009 to 2037. These static projections are intended to approximate generational mortality improvements.

The projection periods are based upon the duration of active liabilities for the respective impacted 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 30%/70% for General Members and 70%/30% 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, 2017 through June 30, 2020. 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, 2016 through June 30, 2019.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

**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 retired General members showed that 73% of males are married and 49% of females are married. We recommend reducing the assumption for future male General retirees from 80% to 70% and maintaining the assumption of 50% for future female General retirees.

An analysis of all retired Safety members showed that 79% are married, but 94% of members that retired in the last three years were married. We recommend maintaining the assumption that 90% of future Safety retirees are married.

An analysis of all retired General and Safety members showed that male members are 3.3 years older than their spouses are and female members are 1.8 years younger than their spouses are. We recommend maintaining the current assumption that male members are three years older than their spouses are, but reducing the assumption from three to two years for the number of years that female members are younger than their spouses are.

PLAN EXPENSES

An allowance of \$1,800,000 for Plan administrative expenses was included in the annual cost calculation in the prior valuation, and was expected to increase with the old assumed price inflation of 3.00% to \$1,854,000. The actual Plan administrative expenses for FYE 2016 were \$2,492,684. Based on a recommendation from Staff, we propose assumed Plan administrative expenses of \$2,200,000 for FYE 2017. These expenses are split between employees and employers based on their share of the overall contributions. Expenses are expected to grow with the new price inflation assumption (2.50% per year) in future years.

COLA / BENEFIT TIMING

Finally, we note that the actuarial valuation software (ProVal) used by Cheiron has been updated to allow for the specification of an exact date on which COLA increases will be applied, which in MCERA's case will be April 1 of each year. In prior valuations, the COLA (payable only to Tier 1 retirees) was applied based on an assumption that the next COLA increase would occur at the end of the valuation year.

However, we have also confirmed with Staff that an adjustment to the assumed timing of the monthly benefit payments is appropriate. We have confirmed that the asset value used in the annual actuarial valuation (as of June 30) is net of the June 30 benefit payments, therefore the next set of benefit payments can be expected to be drawn from the assets at the end of July. Previously, our valuation software was programmed to assume that the next set of benefit payments would be withdrawn from the assets immediately (i.e. at the beginning of the month). Therefore, we believe it is appropriate to update our valuation software to reflect end of month payment, which will offset the impact of the change in the COLA timing item identified above.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2016**

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

The recommended assumptions were adopted by the Board at their November 17, 2016 meeting. The assumptions are based on an experience study covering the period from July 1, 2013 through June 30, 2016.

1. Rate of Return

Assets are assumed to earn 7.25% net of investment expenses.

2. Administrative Expenses

Administrative expenses are assumed to be \$2.20 million for the next year, to be allocated between the employer and employees based on each group's share of the non-expense related contributions. Administrative expenses in future years are expected to increase with the Consumer Price Index (CPI).

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

Benefits are assumed to increase after retirement at the rate of 2.40% per year for Tier 1 members.

5. Increases in Pay

Wage inflation component: 2.75%

Additional longevity and promotion component:

Years of Service	General	Safety
0-1	7.00%	7.50%
2-3	5.00%	5.00%
4	5.00%	3.00%
5	3.00%	1.50%
6-9	2.00%	1.50%
10-14	1.50%	1.00%
15-19	1.00%	1.00%
20+	0.50%	0.50%

6. Final Average Compensation Load

None

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2016**

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

7. Family Composition

50% of female General members, 70% of male General members and 90% of Safety members are assumed to be married at retirement. Male members are assumed to be three years older than their spouses are and female members are assumed to be two years younger than their spouses are.

8. Rates of Termination

Sample rates of termination¹ are shown in the following table.

Years of Service	General Male	General Female	Safety
0	22.5%	12.0%	20.8%
5	8.2%	7.5%	4.6%
10	4.5%	3.6%	4.6%
15	4.5%	3.0%	2.5%
20	4.5%	3.0%	0.0%
25	4.5%	3.0%	0.0%
30	0.0%	0.0%	0.0%

¹ Termination rates do not apply once a member is eligible for retirement.

There are three types of terminations: withdrawals, reciprocal transfers, and vested terminations. Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Rates of reciprocal transfer are for members who leave their member contributions on deposit and engage in employment covered by a pension plan with a reciprocal relationship with MCERA. Finally, rates of vested termination apply to active Members who terminate their employment and leave their member contributions on deposit with the Plan.

The table below shows the percentages of total terminations falling into these categories.

	Years of Service				
	General			Safety	
	0 – 4	5 – 14	15+	0 – 4	5+
Withdrawals	90.0%	40.0%	10.0%	90.0%	30.0%
Transfers	10.0%	10.0%	10.0%	10.0%	25.0%
Vested Terminations	0.0%	50.0%	80.0%	0%	45.0%

Vested terminated General Members are assumed to begin receiving benefits at age 59; vested terminated Safety Members are assumed to begin receiving benefits at age 53. Reciprocal transfer General members are assumed to begin receiving benefits at age 61; reciprocal transfer safety members are assumed to begin receiving benefits at age 55.

Reciprocal transfers' pay growth is assumed to be 3.25% while employed by a reciprocal employer.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2016**

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

9. Rates of Service-Connected Disability

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

Age	Safety	General	
	All	Male	Female
20	0.0000%	0.0027%	0.0040%
25	0.0825%	0.0053%	0.0075%
30	0.2380%	0.0133%	0.0115%
35	0.3940%	0.0240%	0.0150%
40	0.5500%	0.0320%	0.0190%
45	0.7060%	0.0480%	0.0340%
50	0.9230%	0.0640%	0.0600%
55	2.3925%	0.0800%	0.1050%
60	3.0120%	0.1120%	0.1575%
65	3.6385%	0.0000%	0.0000%

10. Rates of Non Service-Connected Disability

Sample non service-connected disability rates of active participants are provided in the table below. Rates are applied once members have at least five years of service.

Age	Safety	General	
	All	Male	Female
20	0.0050%	0.0000%	0.0000%
25	0.0050%	0.0267%	0.0033%
30	0.0100%	0.0533%	0.0067%
35	0.0150%	0.0533%	0.0100%
40	0.0200%	0.0867%	0.0133%
45	0.0250%	0.1267%	0.0300%
50	0.0400%	0.1600%	0.0600%
55	0.0650%	0.2133%	0.0933%
60	0.1000%	0.2800%	0.1533%
65	0.1000%	0.0000%	0.0000%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2016**

APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

11. Rates of Mortality

Mortality rates for actives, retirees, disabled members, beneficiaries, terminated vesteds, and reciprocal transfers are based on the sex-distinct employee and annuitant CalPERS mortality tables as described below. Future mortality improvements are reflected by applying the SOA MP-2016 projection scale on a generational basis from the base year of 2009.

Category	Base Mortality Table
Healthy Annuitant	CalPERS 2009 Healthy Annuitant Mortality Table
Disabled Annuitant	CalPERS 2009 Industrial Disability Mortality Table
Healthy Non-Annuitant	CalPERS 2009 Non-Industrial Employees Mortality Table
Actives, Line of Duty (Safety only)	CalPERS 2009 Industrial Employees Mortality Table

12. Rates of Retirement

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

General Male				General Female			Safety		
Years of Service				Years of Service			Years of Service		
Age	10 – 19	20 – 29	30+	10 – 19	20 – 29	30+	Age	10 – 19	20+
50	5.00%	10.00%	7.50%	2.50%	7.50%	25.00%	40	0.00%	3.10%
51	5.00%	10.00%	7.50%	2.50%	7.50%	25.00%	41	0.00%	3.10%
52	5.00%	10.00%	15.00%	5.00%	12.50%	25.00%	42	0.00%	3.10%
53	5.00%	10.00%	15.00%	5.00%	12.50%	25.00%	43	0.00%	3.10%
54	5.00%	10.00%	15.00%	5.00%	12.50%	25.00%	44	0.00%	3.10%
55	10.00%	12.50%	27.00%	12.00%	25.00%	35.00%	45	0.00%	7.60%
56	10.00%	12.50%	22.50%	8.50%	25.00%	35.00%	46	0.00%	7.60%
57	10.00%	12.50%	22.50%	8.50%	25.00%	35.00%	47	0.00%	7.60%
58	10.00%	12.50%	22.50%	8.50%	25.00%	35.00%	48	0.00%	7.60%
59	10.00%	12.50%	22.50%	10.00%	30.00%	35.00%	49	0.00%	7.60%
60	20.00%	25.00%	37.50%	15.00%	30.00%	35.00%	50	15.00%	32.90%
61	20.00%	25.00%	37.50%	27.50%	40.00%	45.00%	51	12.80%	32.90%
62	20.00%	25.00%	37.50%	27.50%	40.00%	45.00%	52	12.80%	32.90%
63	20.00%	25.00%	37.50%	27.50%	40.00%	45.00%	53	12.80%	32.90%
64	20.00%	25.00%	37.50%	27.50%	40.00%	45.00%	54	12.80%	32.90%
65	35.00%	50.00%	40.00%	40.00%	50.00%	50.00%	55	25.00%	32.90%
66	35.00%	50.00%	45.00%	45.00%	50.00%	50.00%	56	25.00%	32.90%
67	35.00%	50.00%	50.00%	50.00%	50.00%	50.00%	57	25.00%	32.90%
68	35.00%	50.00%	60.00%	60.00%	60.00%	60.00%	58	25.00%	32.90%
69	35.00%	50.00%	80.00%	80.00%	80.00%	80.00%	59	25.00%	32.90%
70+	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	60	100.00%	100.00%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

The assumptions and methods used in the June 30, 2015 actuarial valuation reflect the results of an Experience Study performed by Cheiron covering the period from July 1, 2010 through June 30, 2013 and adopted by the Board.

1. Rate of Return

Assets are assumed to earn 7.75% net of investment expenses.

2. Administrative Expenses

Administrative expenses are assumed to be \$1.80 million for the next year, to be allocated between the employer and employees based on each group's share of the non-expense related contributions. Administrative expenses in future years are expected to increase with the Consumer Price Index (CPI).

3. Cost of Living

The cost of living as measured by the Consumer Price Index (CPI) will increase at the rate of 3.00% per year.

4. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.60% per year for Tier 1 members.

5. Increases in Pay

Wage inflation component: 3.00%

Additional longevity and promotion component:

Years of Service	General	Safety
0-1	4.00%	5.00%
2	3.00%	5.00%
3	2.50%	3.00%
4-6	2.00%	3.00%
7-14	2.00%	2.00%
15-19	1.00%	0.50%
20+	0.00%	0.50%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

6. Family Composition

50% of female General members, 80% of male General members and 90% of Safety members are assumed to be married at retirement. Male members are assumed to be three years older than their spouses are and female members are assumed to be three years younger than their spouses are.

7. Rates of Termination

Sample rates of termination¹ are shown in the following table.

Years of Service	General Male	General Female	Safety
0	25.0%	12.0%	20.8%
5	4.8%	7.5%	4.6%
10	4.8%	3.6%	4.6%
15	4.8%	3.0%	2.5%
20	2.5%	3.0%	0.0%
25	2.5%	3.0%	0.0%
30	0.0%	0.0%	0.0%

¹ Termination rates do not apply once a member is eligible for retirement.

There are three types of terminations: withdrawals, reciprocal transfers, and vested terminations. Rates of withdrawal apply to active Members who terminate their employment and withdraw their member contributions, forfeiting entitlement to future Plan benefits. Rates of reciprocal transfer are for members who leave their member contributions on deposit and engage in employment covered by a pension plan with a reciprocal relationship with MCERA. Finally, rates of vested termination apply to active Members who terminate their employment and leave their member contributions on deposit with the Plan.

The table below shows the percentages of total terminations falling into these categories.

	Years of Service				
	General			Safety	
	0 – 4	5 – 14	15+	0 – 4	5+
Withdrawals	90.0%	40.0%	10.0%	90.0%	15.0%
Transfers	10.0%	12.0%	10.0%	10.0%	42.5%
Vested Terminations	0.0%	48.0%	80.0%	0%	42.5%

Vested terminated General Members are assumed to begin receiving benefits at age 59; vested terminated Safety Members are assumed to begin receiving benefits at age 53.

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

8. Rates of Service-Connected Disability

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

Age	Safety	General	
	All	Female	Male
20	0.3250%	0.0040%	0.0027%
25	0.3625%	0.0075%	0.0053%
30	0.4190%	0.0115%	0.0133%
35	0.5063%	0.0150%	0.0240%
40	0.6375%	0.0190%	0.0320%
45	0.7815%	0.0340%	0.0480%
50	0.9940%	0.0600%	0.0640%
55	1.2625%	0.1050%	0.0800%
60	0.0000%	0.1575%	0.1120%
65	0.0000%	0.0000%	0.0000%

9. Rates of Non Service-Connected Disability

Sample non service-connected disability rates of active participants are provided in the table below. Rates are applied once members have at least five years of service.

Age	Safety	General	
	All	Female	Male
20	0.0000%	0.0000%	0.0000%
25	0.0200%	0.0033%	0.0267%
30	0.0300%	0.0067%	0.0533%
35	0.0400%	0.0100%	0.0533%
40	0.0600%	0.0133%	0.0867%
45	0.0900%	0.0300%	0.1267%
50	0.1200%	0.0600%	0.1600%
55	0.1600%	0.0933%	0.2133%
60	0.0000%	0.1533%	0.2800%
65	0.0000%	0.0000%	0.0000%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

10. Rates of Mortality for Healthy Lives

Mortality rates for active members, retirees, beneficiaries, and deferred members are based on the sex distinct Retired Pensioner (RP) 2000 Combined Healthy Tables, published by the Society of Actuaries, projected to 2027 using Projection Scale BB. This is intended to approximate a generational approach.

11. Rates of Mortality for Disabled Retirees

Mortality rates for disabled members are based on the sex distinct Retired Pensioner (RP) 2000 Combined Healthy Tables, published by the Society of Actuaries, projected to 2027 using Projection Scale BB, set forward three years for males and females.

12. Rates of Retirement

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

General Male				General Female			Safety		
Years of Service				Years of Service			Years of Service		
Age	10 – 19	20 – 29	30+	10 – 19	20 – 29	30+	Age	10 – 19	20+
50	2.50%	5.00%	7.50%	2.50%	10.00%	10.00%	40	0.00%	3.10%
51	2.50%	5.00%	7.50%	2.50%	10.00%	10.00%	41	0.00%	3.10%
52	5.00%	10.00%	15.00%	5.00%	15.00%	20.00%	42	0.00%	3.10%
53	5.00%	10.00%	15.00%	5.00%	15.00%	20.00%	43	0.00%	3.10%
54	5.00%	10.00%	15.00%	5.00%	15.00%	20.00%	44	0.00%	3.10%
55	9.00%	18.00%	27.00%	9.00%	35.00%	35.00%	45	0.00%	7.60%
56	7.50%	15.00%	22.50%	7.50%	30.00%	35.00%	46	0.00%	7.60%
57	7.50%	15.00%	22.50%	7.50%	30.00%	35.00%	47	0.00%	7.60%
58	7.50%	15.00%	22.50%	7.50%	30.00%	35.00%	48	0.00%	7.60%
59	7.50%	15.00%	22.50%	7.50%	30.00%	35.00%	49	0.00%	7.60%
60	25.00%	25.00%	37.50%	25.00%	30.00%	35.00%	50	12.80%	32.90%
61	25.00%	25.00%	37.50%	25.00%	40.00%	45.00%	51	12.80%	32.90%
62	25.00%	25.00%	37.50%	25.00%	40.00%	45.00%	52	12.80%	32.90%
63	25.00%	25.00%	37.50%	25.00%	40.00%	45.00%	53	12.80%	32.90%
64	25.00%	25.00%	37.50%	25.00%	40.00%	45.00%	54	12.80%	32.90%
65	40.00%	40.00%	40.00%	40.00%	50.00%	50.00%	55	12.80%	32.90%
66	45.00%	45.00%	45.00%	45.00%	50.00%	50.00%	56	12.80%	32.90%
67	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	57	12.80%	32.90%
68	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	58	12.80%	32.90%
69	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	59	12.80%	32.90%
70+	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	60	100.00%	100.00%

**MERCED COUNTY EMPLOYEES RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2016**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

13. Final Average Compensation Load

The final average compensation (FAC) for members projected to receive a service retirement benefit has been increased based on the assumption that members will have elements of pay included in their FAC which are not included in the annual pay provided to the Actuary (Ventura decision pays). The FAC for Tier 1 members has been increased by 6.92% and the FAC for Tier 2 and Tier 3 members by 2.31%.



Classic Values, Innovative Advice