CHEIRON *Classic Values, Innovative Advice*

# Santa Barbara County Employees' Retirement System

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

**Produced by Cheiron**

**December 2016**

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December 8, 2016

Board of Retirement
Santa Barbara County Employees' Retirement System
3916 State Street, Suite 210
Santa Barbara, CA 93105

Dear Members of the Board:

The purpose of this report is to provide the results of an Actuarial Experience Study of the Santa Barbara County Employees' Retirement System (SBCERS) covering actuarial experience from July 1, 2013 through June 30, 2016. This report is for the use of the SBCERS 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 SBCERS. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

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

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

Sincerely,
Cheiron

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

Anne D. Harper, FSA, EA, 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 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 SBCERS, 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 SBCERS'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 7.00% long-term rate of return on Plan assets, an annual increase in prices measured by the Consumer Price Index (CPI) of 2.75%, annual wage increase equal to 25 basis points greater than price increases (3.00% in total), and a post-retirement COLA average growth rate of 2.60% and 1.90% for the 3.0% and 2.0% COLA groups, respectively.

The discount rate assumption is higher than the long-term (10-year) capital market assumptions of 6.42% from RVK, the Plan's investment consultant. However, we reviewed the capital market assumptions from three other investment consultants and they all project slightly higher returns than RVK for the next 10 years. Using the other consultants' capital market assumptions, we computed expected returns for SBCERS's target portfolio, which indicated an average expected nominal 10-year geometric return of 6.65% (reflecting a 4.50% expected real return with 2.15% inflation). If the current target asset allocation is maintained and these projections are realized, the Plan would experience a pattern of actuarial losses from the assets in the near term, though they may be partially offset by liability gains if wage and COLA inflation rates are below the assumed rates (3.00% and 2.60%, respectively) over the same time period.

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** – Reduce General rates with less than 30 years of service and increase rates after 30 years of service. Reduce Safety rates with less than 20 years of service and increase rates after 20 years of service.
- **Termination rates** – Minor increases to General rates with 20 or more years of service. Modest changes for Safety members with less than 10 years of service.

- **Refund rates** – Decrease for both General and Safety after five years of service.
- **Disability rates** – Slight decreases for both General and Safety rates.
- **Mortality rates** – Adjusted CalPERS base tables, with generational improvement for all members.
- **Merit salary increases** – No changes.
- **Other assumptions** – Minor changes to other assumptions, including Safety Plan 6 deferral age, sick leave load, reciprocal transfers, and COLA timing.

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

**Impact of Assumption Changes on Employer Contribution Rates**

| | General Contribution Rate | Safety Contribution Rate | APCD Contribution Rate | Total Contribution Rate |
|---|---|---|---|---|
| Demographic Assumption Changes: | | | | |
| Mortality Rates | 0.56% | 0.28% | 0.57% | 0.51% |
| Termination and Refund Rates | 0.13% | 0.12% | 0.12% | 0.12% |
| Retirement Rates | 0.36% | 0.15% | 0.49% | 0.30% |
| Disability Rates | (0.03%) | (0.07%) | (0.02%) | (0.04%) |
| Deferred Vested Memebers Retirement Age | 0.00% | ( 0.19%) | 0.00% | ( 0.05%) |
| Sick Leave Load | ( 0.01%) | 0.21% | ( 0.01%) | 0.04% |
| COLA Timing | 0.16% | 0.29% | 0.16% | 0.20% |
| Reciprocal Transfers | (0.17%) | (0.18%) | (0.23%) | (0.18%) |
| All Demographic Changes | 1.00% | 0.61% | 1.08% | 0.90% |
| Economic Assumption Changes | 1.49% | 2.78% | 1.90% | 1.84% |
| Expense Assumption Change | 0.15% | 0.15% | 0.15% | 0.15% |
| Employee Contribution Rate Increases | ( 0.33%) | ( 0.44%) | ( 0.39%) | ( 0.36%) |
| **All Assumption Changes (1st Year)** | **2.31%** | **3.10%** | **2.74%** | **2.53%** |
| **Ultimate Impact after 5-year phase-in** | **6.38%** | **9.24%** | **8.93%** | **7.15%** |

# 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.

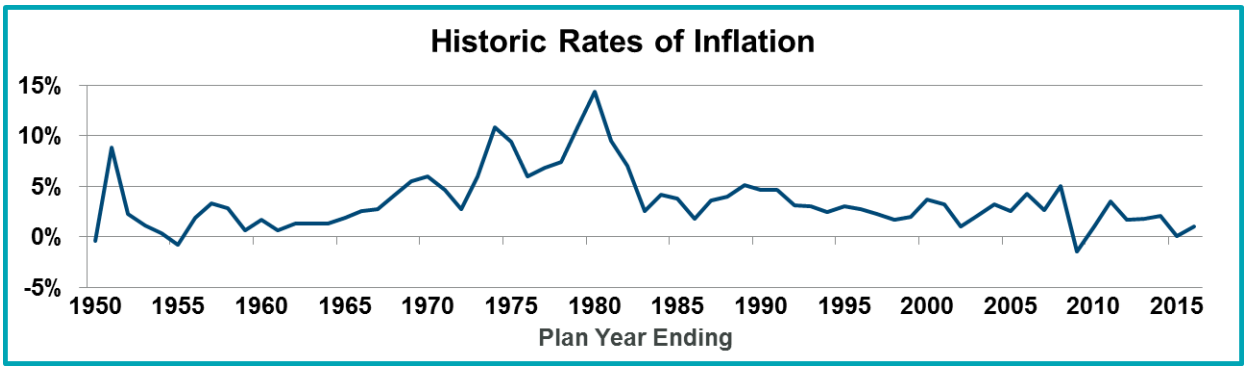
## PRICE INFLATION

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 30th) since 1950.

**Chart II-1**



# 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**

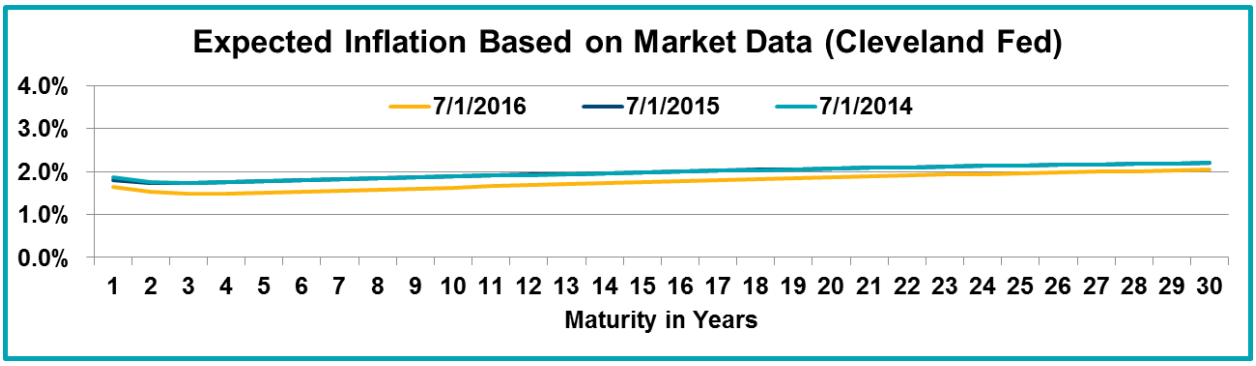
**Break-Even Inflation Based on Treasury Bond Yields**

| 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% |

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).

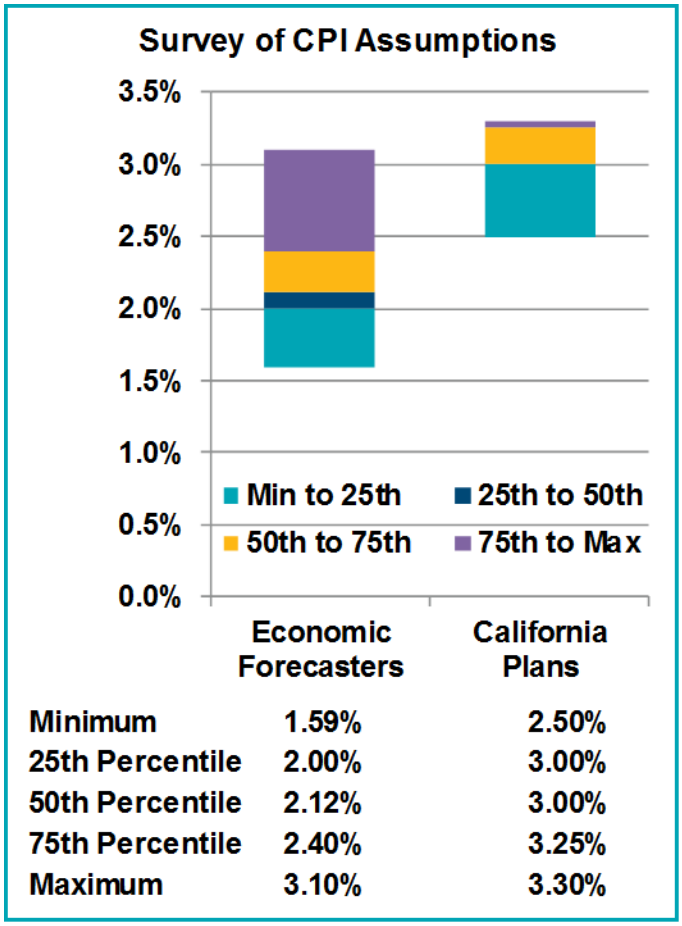
**Chart II-2**



## SECTION II – ECONOMIC ASSUMPTIONS
### PRICE INFLATION

The Federal Reserve Bank of Philadelphia publishes a quarterly survey of professional economic forecasters. Chart III-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**




| | Economic Forecasters | California Plans |
|---|---|---|
| Minimum | 1.59% | 2.50% |
| 25th Percentile | 2.00% | 3.00% |
| 50th Percentile | 2.12% | 3.00% |
| 75th Percentile | 2.40% | 3.25% |
| Maximum | 3.10% | 3.30% |

Finally, RVK, the Board's investment consultant, uses an 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 2.0% and 3.25%. Therefore, we agree with the Board's recent action to reduce the assumption from 3.00% to 2.75%.

# 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.

Usually we recommend that long range gains due to productivity, the collective bargaining process or other pressures should be assumed to be zero or minimal. While productivity tends to increase in many sectors of the economy, any long-term assumption of salary growth beyond inflation carries with it an assumed improvement in relative standard of living.

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 reduce the non-inflationary base payroll growth assumption from 0.50% to 0.25% annually. As a result of this decrease and the 0.25% decrease in price inflation, the annual expected increase in base payroll would be 3.00%, reduced from 3.50% 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.

## COLA GROWTH

Members of SBCERS are eligible to receive automatic Cost-of-Living Adjustments (COLAs), based on the growth in the Los Angeles Area Consumer Price Index (CPI-U) and a 3% or 2% cap, depending on the plan, on the annual COLA increase. Any increase in the CPI above the maximum increase can be banked for future years in which the change in the CPI is below the maximum increase.

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

We have produced statistical simulations of inflation and then modeled how the COLA maximum and the banking process interact with the changes in CPI. For a given long-term estimate of inflation, we used 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 2.75% inflation assumption adopted by the Board and found to be reasonable by Cheiron, we recommend decreasing the COLA growth assumption from 2.75% to 2.60% for the group capped at 3.0% and from 2.0% to 1.9% for the group capped at 2.0%.

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 SBCERS's case will be April 1 of each year. In prior valuations, a load was applied to the Plan's liabilities to account for the April 1 timing of the COLA; in future valuations, the date of COLA will be reflected directly in the valuation coding.

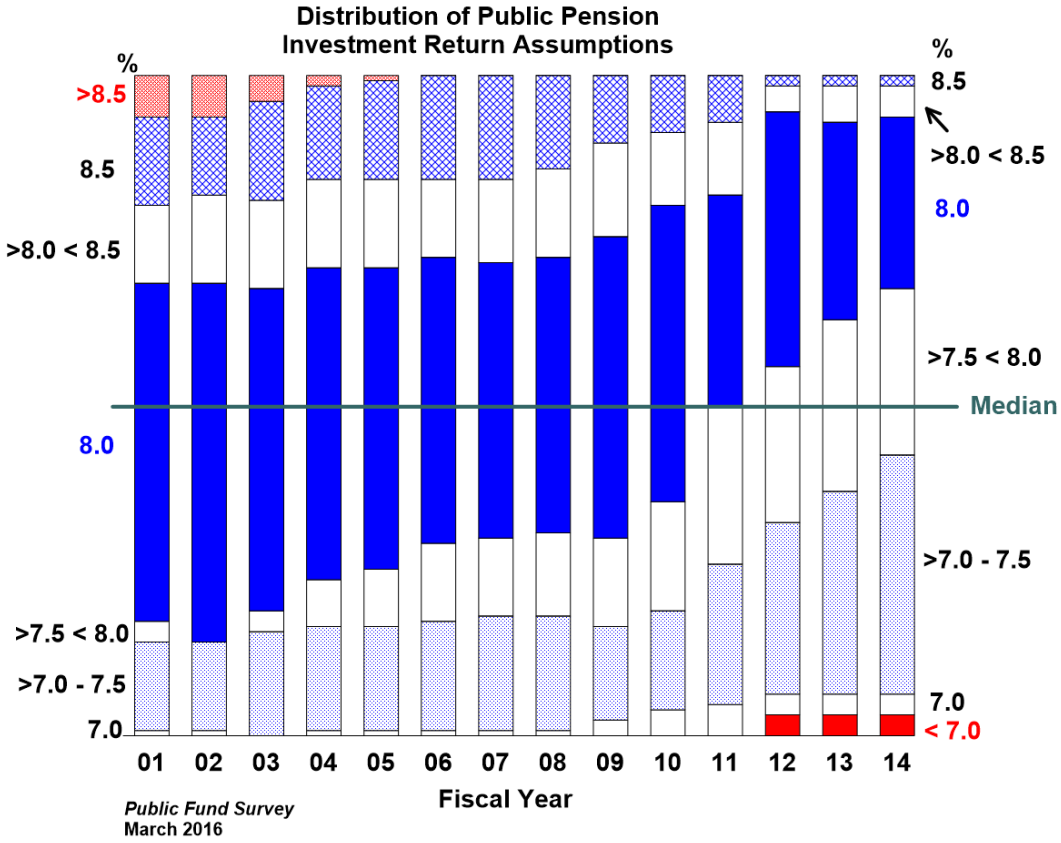
# DISCOUNT RATE

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

## Other Large Public Retirement Plans

Based on the Public Fund Survey, developed by the National Association of State Retirement Administrators (NASRA) covering most of the largest public retirement systems in the country, there has been a general movement over at least the last decade to reduce the discount rate used in actuarial valuations. Chart II-4 below shows the change in the distribution of assumptions since 2001. The median assumption is now 7.75% and the number of plans using a discount rate of 7.5% or lower has increased significantly.

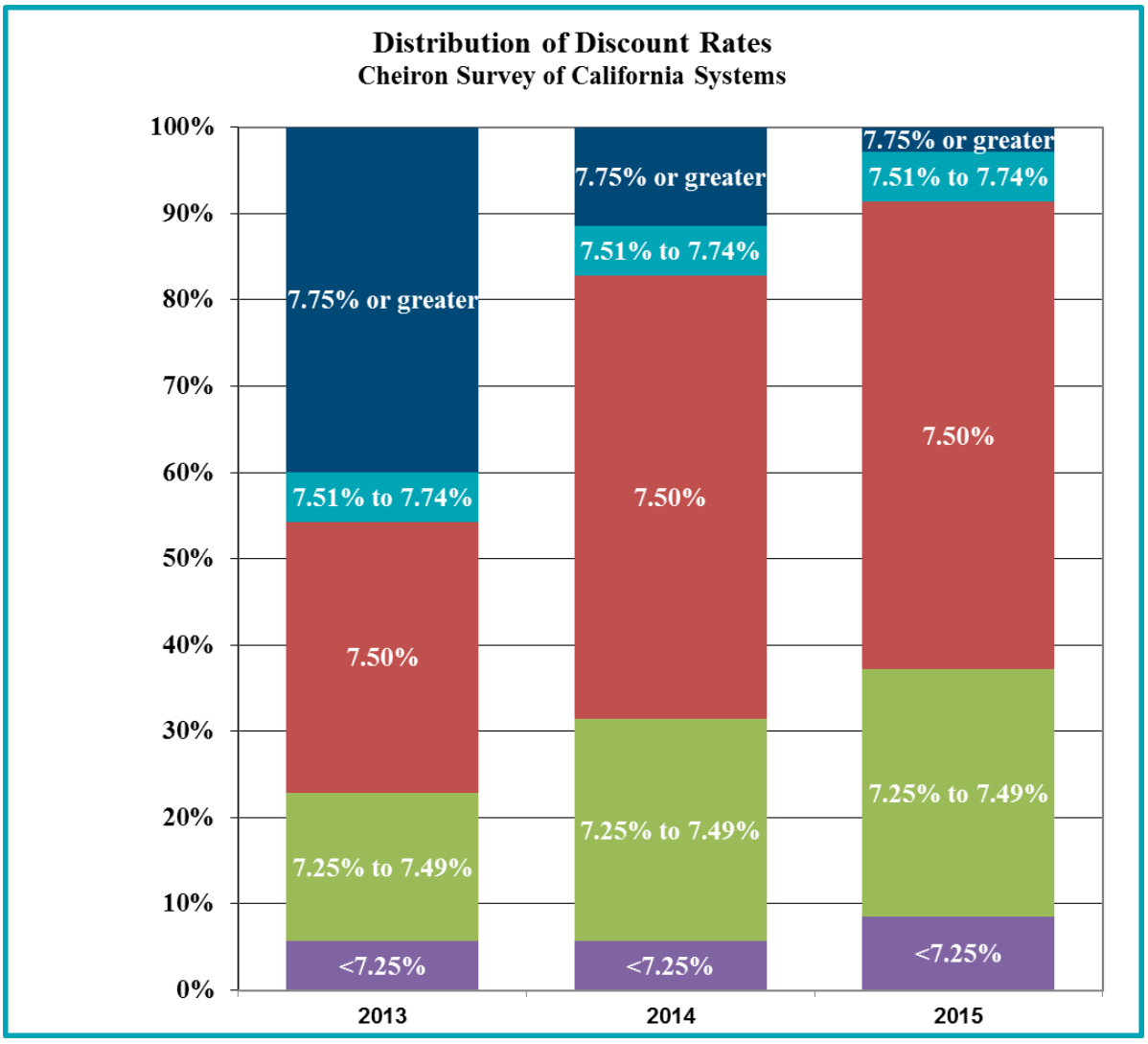
**Chart II-4**



## SECTION II – ECONOMIC ASSUMPTIONS
### DISCOUNT RATE

In our survey of California retirement systems, the median assumption is even lower 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%. 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.

## 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 (RVK). Based on these assumptions, we calculated an expected geometric return of 6.42%.

**Table II-2**

**RVK 10-year Assumptions**

| Asset Category | Target Allocation | Arithmetic Return | Geometric Return | Standard Deviation |
|---|---|---|---|---|
| Broad US | 19.0% | 7.1% | 5.6% | 17.8% |
| International Developed | 11.0% | 8.3% | 6.6% | 19.0% |
| Emerging Markets | 7.0% | 11.0% | 7.4% | 29.0% |
| IG Fixed Income | 17.0% | 3.4% | 3.3% | 6.0% |
| Non-IG Fixed Income | 11.0% | 6.0% | 5.4% | 11.2% |
| Real Return | 15.0% | 7.0% | 6.2% | 13.2% |
| Real Estate | 10.0% | 7.7% | 6.6% | 15.3% |
| Private Equity | 10.0% | 10.3% | 7.4% | 25.5% |
| **Total** | **100.0%** | **7.11%** | **6.42%** | **12.23%** |
| **Real Return** | | **4.61%** | **3.92%** | |

We also reran the results using the capital market assumptions from three other investment consultants - who were chosen because their published expectations included similar asset classes to those included in the SBCERS portfolio - and using a broader survey of capital market assumptions conducted by Horizon Actuarial Services using 10 and 20-year expectations. The results are shown in Table II-3 below.

**Table II-3**

**SBCERS Target Portfolio Return Expectations**

| Consultant | Nominal | Inflation | Real |
|---|---|---|---|
| **RVK** | 6.42% | 2.50% | 3.92% |
| **Callan** | 6.66% | 2.25% | 4.41% |
| **Marco** | 6.94% | 2.20% | 4.74% |
| **Verus** | 6.33% | 1.98% | 4.35% |
| **Average** | 6.65% | 2.14% | 4.50% |
| **Horizon (Survey, 10-year)** | 6.84% | 2.16% | 4.68% |
| **Horizon (Survey, 20-year)** | 7.83% | 2.31% | 5.52% |

## SECTION II – ECONOMIC ASSUMPTIONS
### DISCOUNT RATE

The average geometric return over a 10-year period based on the other consultants' expectations was 6.65%, while the return from the Horizon surveys was even higher at 6.84% over 10 years and 7.83% 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 RVK survey assumptions was 6.42%, which is lower than the 7.00% nominal return recently adopted by the Board. Using RVK's average inflation assumption (2.50%), this results in a 3.92% real return assumption.

In Table II-4, the median real return under the three other consultants of 4.48% is higher than that recently adopted by the Board: 4.25%, based on a 7.00% nominal return and 2.75% price inflation.

**Table II-4**

**Expected Distribution of Average Annual Passive Investment Returns**

| | RVK | | Avg: Callan, Marco, Verus | |
|---|---|---|---|---|
| Percentile | Nominal | Real | Nominal | Real |
| **95th** | 12.91% | 10.41% | 12.89% | 10.75% |
| **75th** | 9.03% | 6.53% | 9.15% | 7.01% |
| **50th** | 6.42% | 3.92% | 6.62% | 4.48% |
| **25th** | 3.86% | 1.36% | 4.16% | 2.01% |
| **5th** | 0.30% | -2.20% | 0.71% | -1.43% |

We also computed the likelihood of achieving various average geometric returns over a 10-year period, for various nominal and real return assumptions considered by the Board. We note that the expected likelihood of achieving the 7.00% nominal return adopted by the Board averaged 45% between the four investment consultants, but the likelihood of achieving the 4.25% real return was slightly over 50%.

**Table II-5**

**Likelihood of Achieving Average Returns**

| | Nominal | | | Real | | |
|---|---|---|---|---|---|---|
| Consultant | 7.00% | 7.25% | 7.50% | 4.00% | 4.25% | 4.50% |
| **RVK** | 44% | 41% | 39% | 49% | 47% | 44% |
| **Callan** | 47% | 45% | 43% | 54% | 51% | 49% |
| **Marco** | 49% | 46% | 43% | 59% | 56% | 53% |
| **Verus** | 41% | 38% | 35% | 54% | 51% | 48% |
| **Average** | 45% | 43% | 40% | 54% | 51% | 49% |

## 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 7.00% is slightly more optimistic than the RVK long-term capital market assumptions, but it is reasonable when considering the expectations of a wider-range of investment consultant expectations. As indicated above, the average expected real return for the SBCERS target portfolio for the three other investment consultants included in our analysis is higher than the assumed real rate of 4.25% 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 RVK and much of the investment community are correct in their projections, we can expect returns below the 7.00% assumed rate for a number of years. This will result in actuarial losses and increases in employer contribution rates. However, these losses may be partially offset by gains on the liabilities from price and wage inflation below the assumed level (2.75% and 3.00%, 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 ten 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.

## 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 SBCERS, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where SBCERS 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 SBCERS'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). However, since we haven't proposed any changes to the rates for General or Safety, the red and green lines overlap.

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

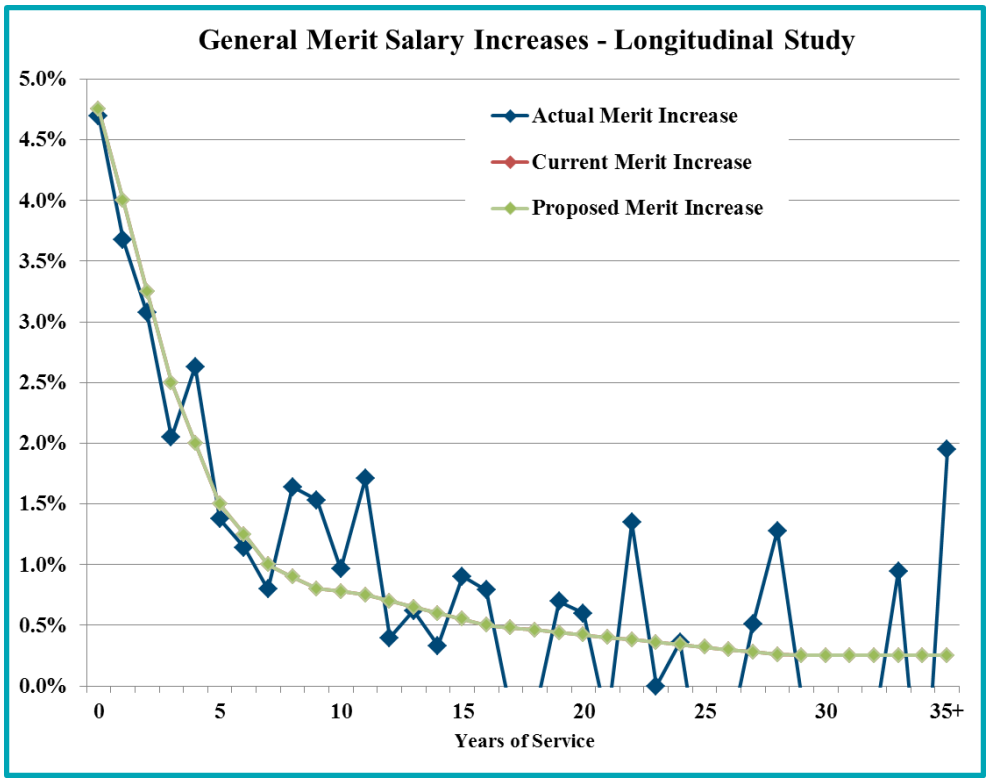
## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### MERIT SALARY INCREASES

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. However, as stated above, the lines overlap in this report, since no changes to the assumptions are being proposed.

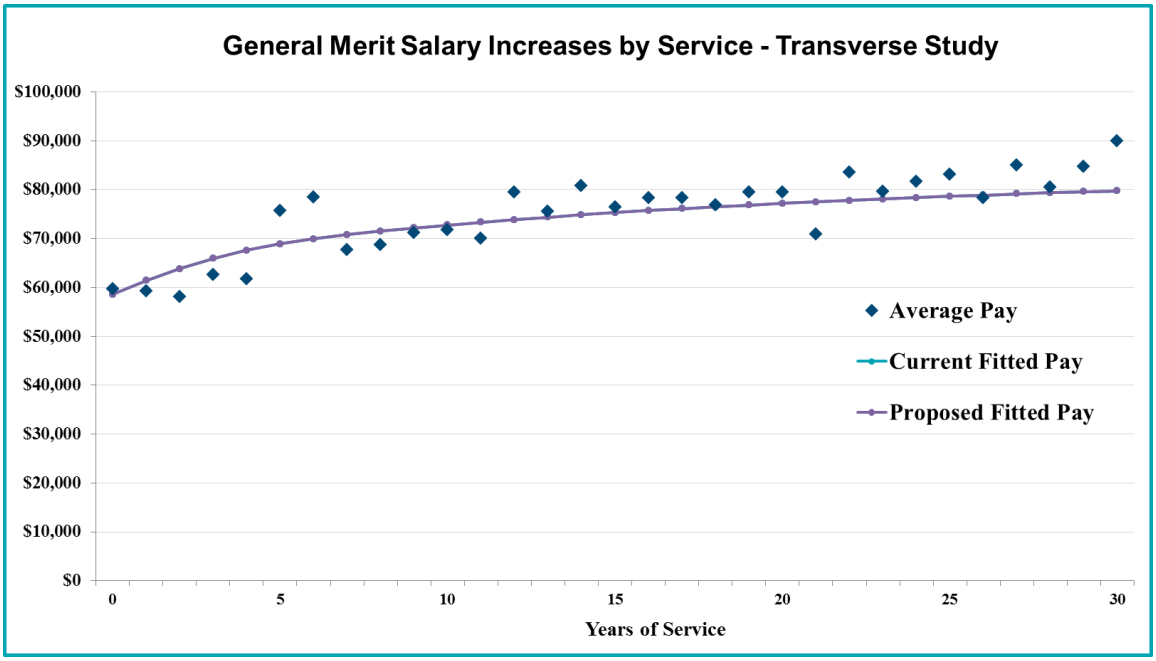
We conclude that the current assumptions provide a reasonable fit to the data under both the longitudinal and transverse approaches, therefore no changes to the assumptions are proposed.

**Chart III-1: General**

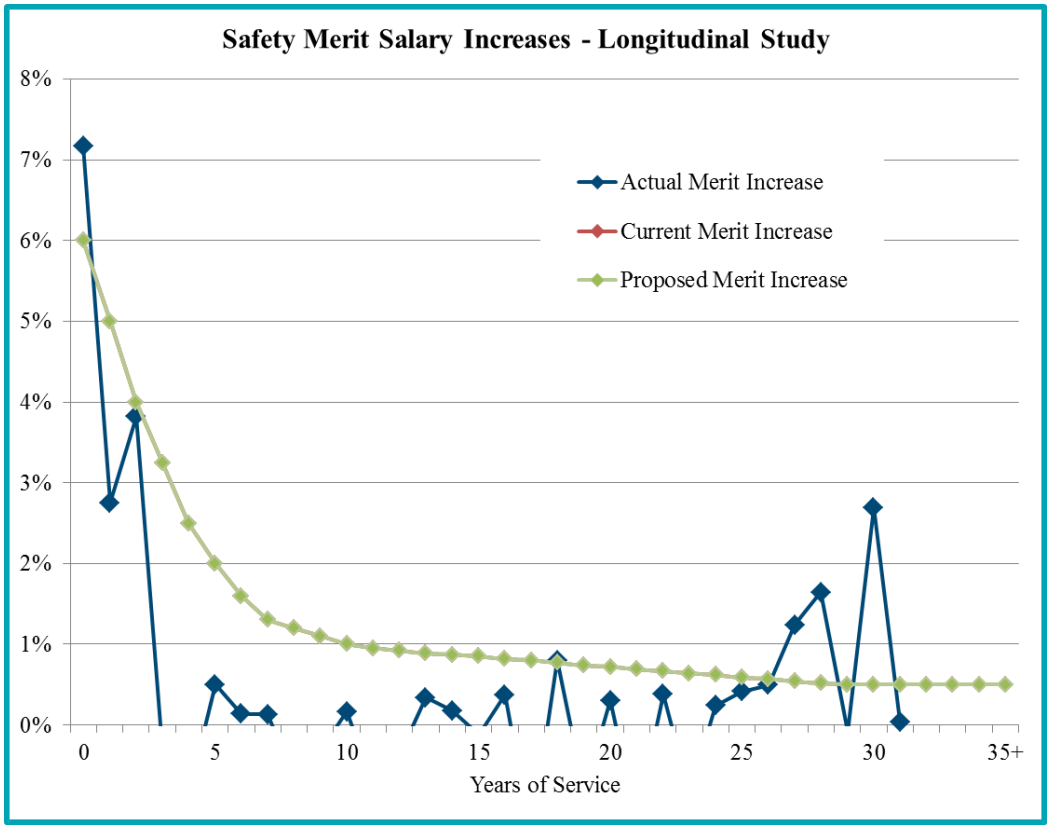


## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### MERIT SALARY INCREASES

### Chart III-2: General

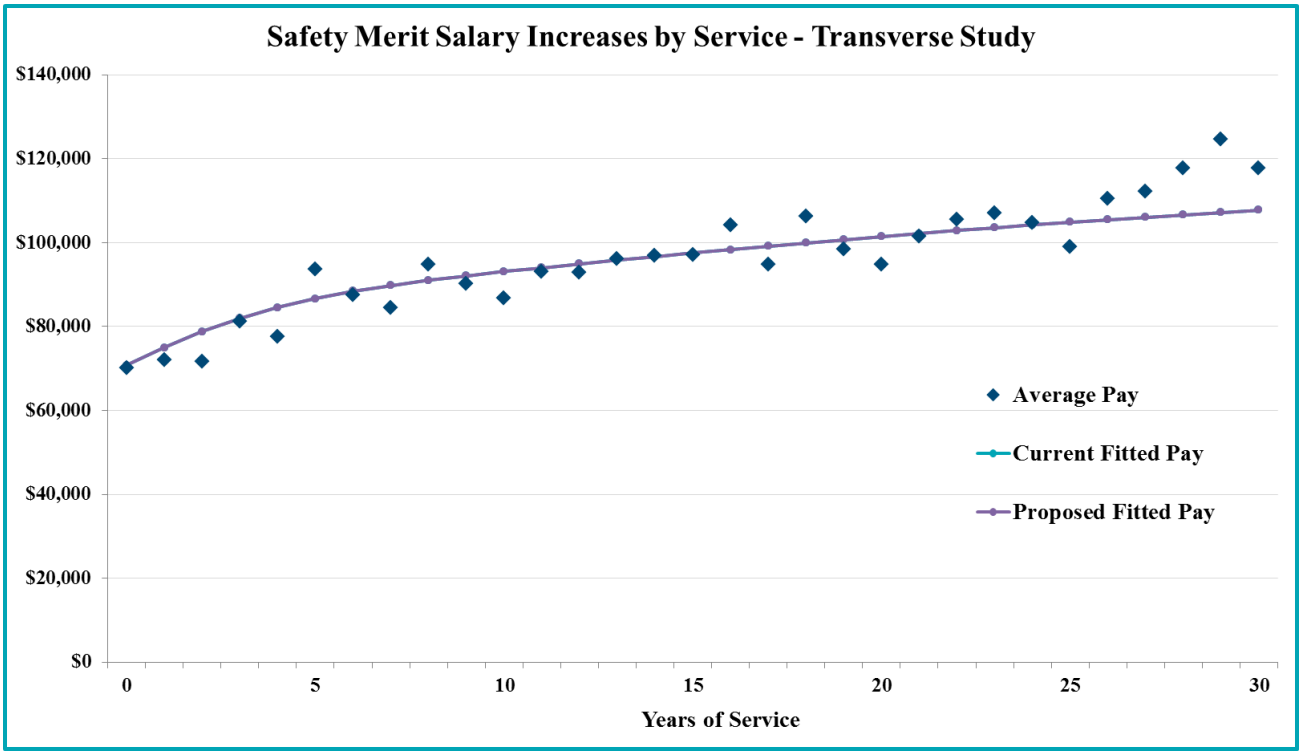



### Chart III-3: Safety



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

### Chart III-4: Safety



# 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 SBCERS'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%.

# RETIREMENT RATES

The current retirement rates vary by age and gender 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 SBCERS actual retirement rates based on service groupings since SBCERS is not large enough to justify assumptions for each age and service combinations. We recommend separate assumptions by age for the following two service groups for General members; 1) members with less than 30 years of service and 2) members with 30 or more years of service. Also, we found that the retirement rates were not materially different between males and females and no longer recommend separate rates by gender.

We recommend separate assumptions by age for the following two service groups for Safety Plan 4 and Plan 6 members; 1) members with less than 20 years of service and 2) members with 20 or more years of service.

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### RETIREMENT RATES

We continue to recommend using the same assumptions for the General PEPRA members and using the Safety Plan 4 retirement rates for the Safety PEPRA members since we do not yet have any plan experience to support a different set of assumptions. In addition, our initial modeling of the PEPRA benefits revealed that the actuarially determined contribution rates required to fund these benefits are relatively insensitive to the actual retirement rates, as a result of the early retirement reductions reflected in the benefit formulas.

Table III-R1 shows the calculation of actual-to-expected ratios and the r-squared statistic for General members with less than 30 years of service. Charts 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 82% to 102%. The r-squared also increases from 0.84 to 0.90.

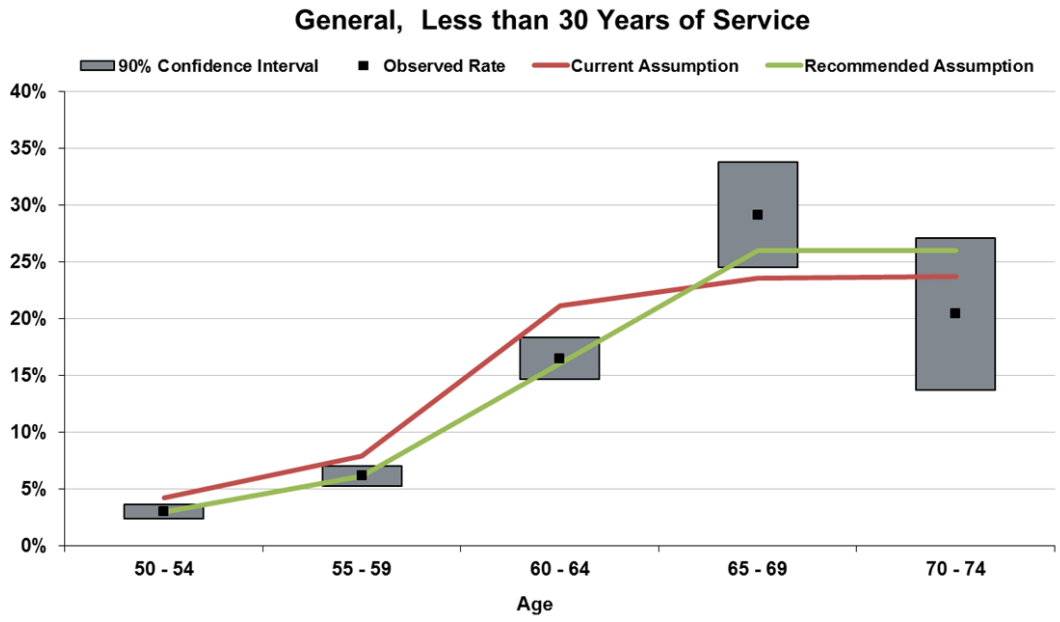
See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 75.

**Table III-R1 – General**

| General, Less than 30 Years of Service | | | | | | |
|---|---|---|---|---|---|---|
| | | Retirements | | | Actual to Expected Ratios | |
| Age | Exposures | Actual | Current | Recommended | Current | Recommended |
| 50 - 54 | 2,009 | 61 | 84.5 | 60.3 | 72% | 101% |
| 55 - 59 | 1,903 | 117 | 150.9 | 116.9 | 78% | 100% |
| 60 - 64 | 1,080 | 178 | 228.1 | 173.6 | 78% | 103% |
| 65 - 69 | 261 | 76 | 61.4 | 67.9 | 124% | 112% |
| 70 - 74 | 98 | 20 | 23.2 | 25.5 | 86% | 78% |
| **Total** | **5,351** | **452** | **548** | **444** | **82%** | **102%** |
| **R-squared** | | | **0.838** | **0.902** | | |

# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## RETIREMENT RATES

### Chart III-R1 – General



## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### RETIREMENT RATES

Table III-R2 shows the calculation of actual-to-expected ratios and the r-squared statistic for General members with more than 30 years of service and Chart III-R2 shows the information graphically along with the 90% confidence interval.

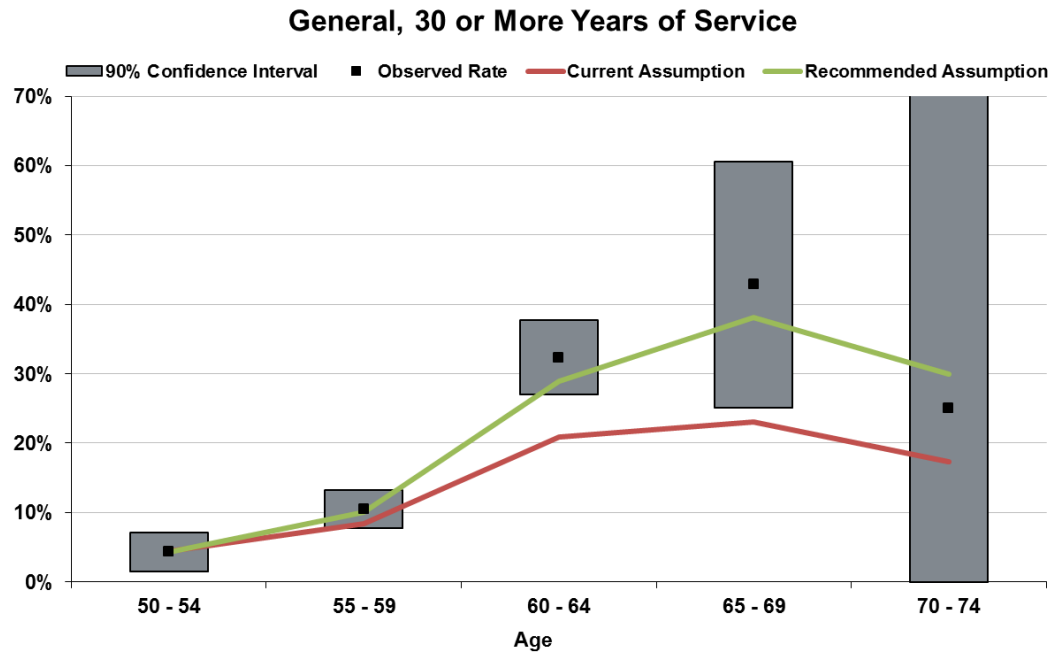
The data shows higher actual retirement rates than expected under the current assumption. The proposed assumption increases the overall assumed rate of retirement and decreases the aggregate A/E ratio from 143% to 109%. The r-squared increases from 0.93 to 0.96.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 75.

**Table III-R2 – General**

| General, 30 or More Years of Service | | | | | | |
|---|---|---|---|---|---|---|
| | | Retirements | | | Actual to Expected Ratios | |
| Age | Exposures | Actual | Current | Recommended | Current | Recommended |
| 50 - 54 | 139 | 6 | 6.1 | 6.0 | 98% | 100% |
| 55 - 59 | 334 | 35 | 27.9 | 33.4 | 125% | 105% |
| 60 - 64 | 207 | 67 | 43.3 | 59.9 | 155% | 112% |
| 65 - 69 | 21 | 9 | 4.8 | 8.0 | 186% | 113% |
| 70 - 74 | 4 | 1 | 0.7 | 1.2 | 145% | 83% |
| **Total** | **705** | **118** | **83** | **108** | **143%** | **109%** |
| **R-squared** | | | **0.931** | **0.961** | | |

**Chart III-R2 – General**



## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### RETIREMENT RATES

Table III-R3 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety Plan 4 members with less than 20 years of service. Chart III-R3 shows the information graphically along with the 90% confidence interval.

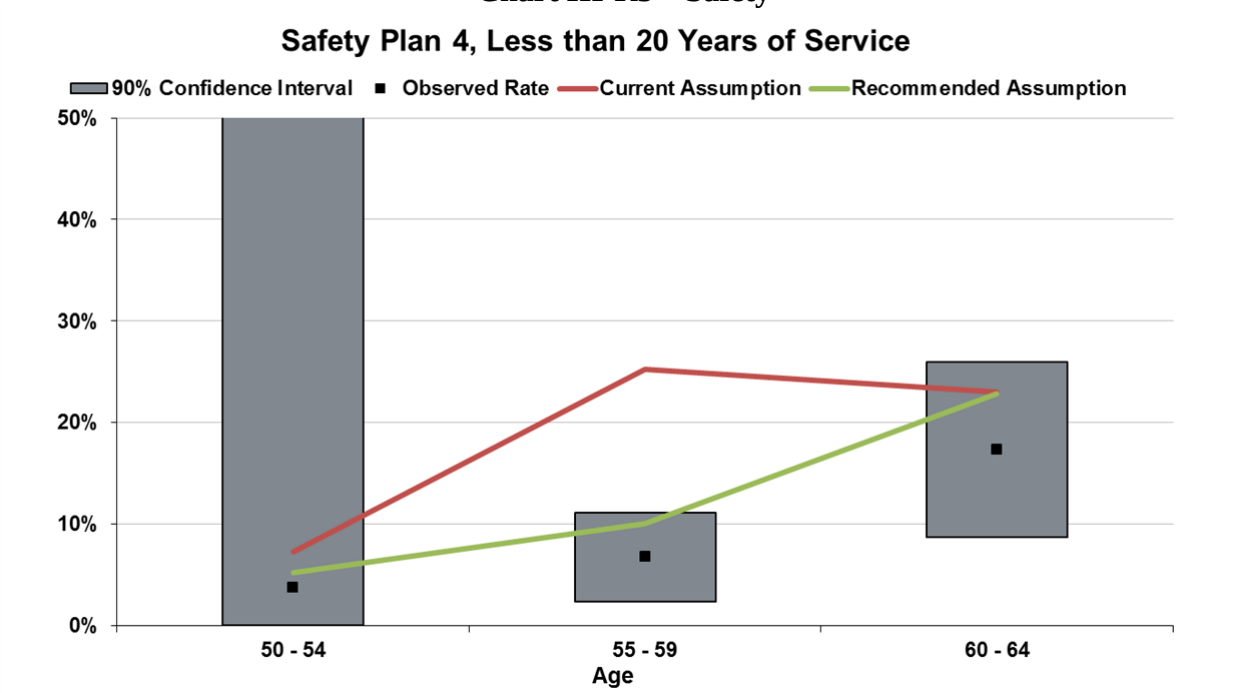
The data shows lower actual retirement rates than expected under the current assumption. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 45% to 72%. The r-squared also increases from 0.35 to 0.62.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 65.

**Table III-R3 – Safety**

| Safety Plan 4, Less than 20 Years of Service | | | | | | |
|---|---|---|---|---|---|---|
| | | Retirements | | | Actual to Expected Ratios | |
| Age | Exposures | Actual | Current | Recommended | Current | Recommended |
| 50 - 54 | 136 | 5 | 9.9 | 7.1 | 51% | 71% |
| 55 - 59 | 89 | 6 | 22.5 | 8.9 | 27% | 67% |
| 60 - 64 | 52 | 9 | 12.0 | 11.9 | 75% | 76% |
| **Total** | **277** | **20** | **44** | **28** | **45%** | **72%** |
| **R-squared** | | | **0.354** | **0.619** | | |

**Chart III-R3 – Safety**



## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### RETIREMENT RATES

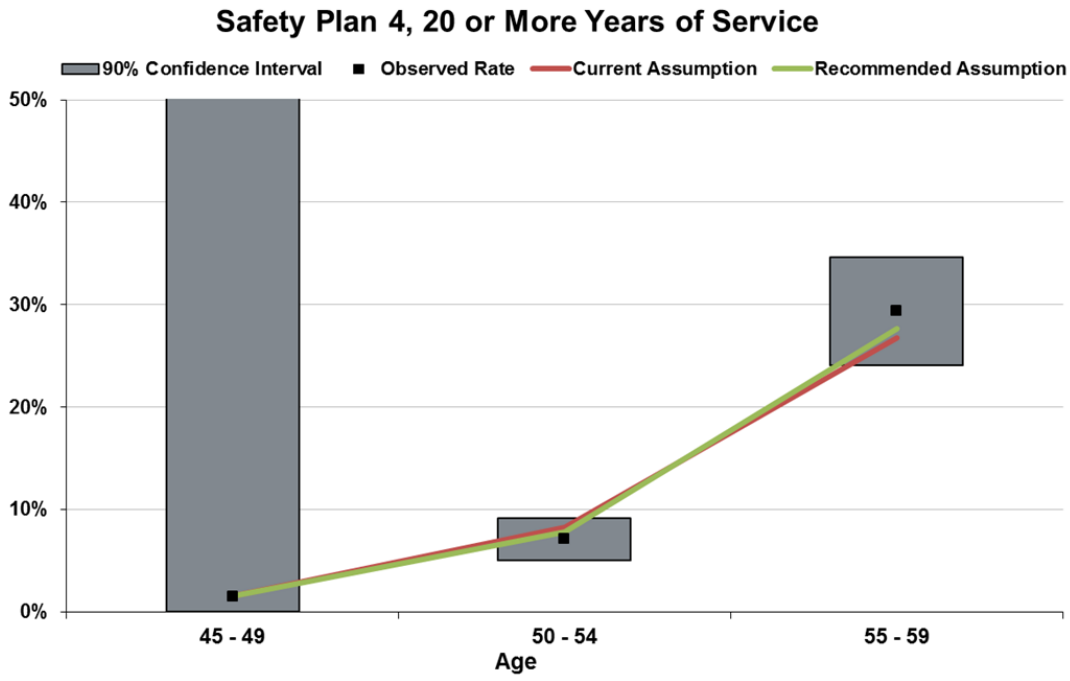
Table III-R4 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety Plan 4 members with 20 or more years of service. Chart III-R4 shows the information graphically along with the 90% confidence interval.

The data shows actual retirement rates are close to expected under the current assumption. We recommend only modest changes to these Safety retirement rates at this time. The proposed assumption roughly maintains the aggregate assumed rate of retirement and aggregate A/E ratio, though the A/E ratios for various age bands are closer to 100% under the proposed assumptions. The r-squared increases from 0.97 to 0.99.

**Table III-R4 – Safety**

| Safety Plan 4, 20 or More Years of Service | | | | | | |
|---|---|---|---|---|---|---|
| | | Retirements | | | Actual to Expected Ratios | |
| Age | Exposures | Actual | Current | Recommended | Current | Recommended |
| 45 - 49 | 205 | 3 | 3.2 | 3.2 | 94% | 94% |
| 50 - 54 | 424 | 30 | 35.0 | 33.1 | 86% | 91% |
| 55 - 59 | 201 | 59 | 53.8 | 55.6 | 110% | 106% |
| 60 - 64 | 26 | 7 | 6.0 | 6.8 | 117% | 103% |
| **Total** | **856** | **99** | **98** | **99** | **101%** | **100%** |
| **R-squared** | | | **0.972** | **0.985** | | |

**Chart III-R4 – Safety**



## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### RETIREMENT RATES

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 65.

Table III-R5 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety Plan 6 members with less than 20 years of service. Chart III-R5 shows the information graphically along with the 90% confidence interval.

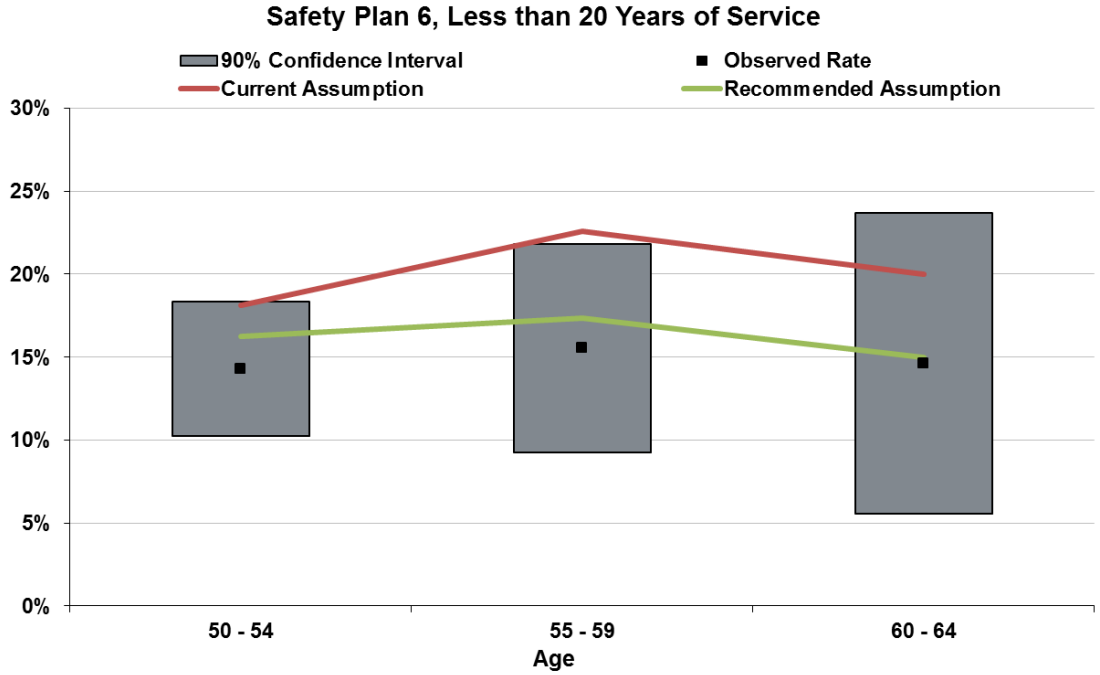
The data shows lower actual retirement rates than expected under the current assumption. The proposed assumption decreases the aggregate assumed rate of retirement and increases the aggregate A/E ratio from 75% to 89%. The r-squared also increases from 0.83 to 0.87.

See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 65.

**Table III-R5 – Safety**

| Safety Plan 6, Less than 20 Years of Service | | | | | | |
|---|---|---|---|---|---|---|
| | | Retirements | | | Actual to Expected Ratios | |
| Age | Exposures | Actual | Current | Recommended | Current | Recommended |
| 50 - 54 | 203 | 29 | 36.8 | 33.0 | 79% | 88% |
| 55 - 59 | 90 | 14 | 20.3 | 15.6 | 69% | 90% |
| 60 - 64 | 41 | 6 | 8.2 | 6.2 | 73% | 98% |
| **Total** | **334** | **49** | **65** | **55** | **75%** | **89%** |
| **R-squared** | | | **0.830** | **0.869** | | |

**Chart III-R5 – Safety**



## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### RETIREMENT RATES

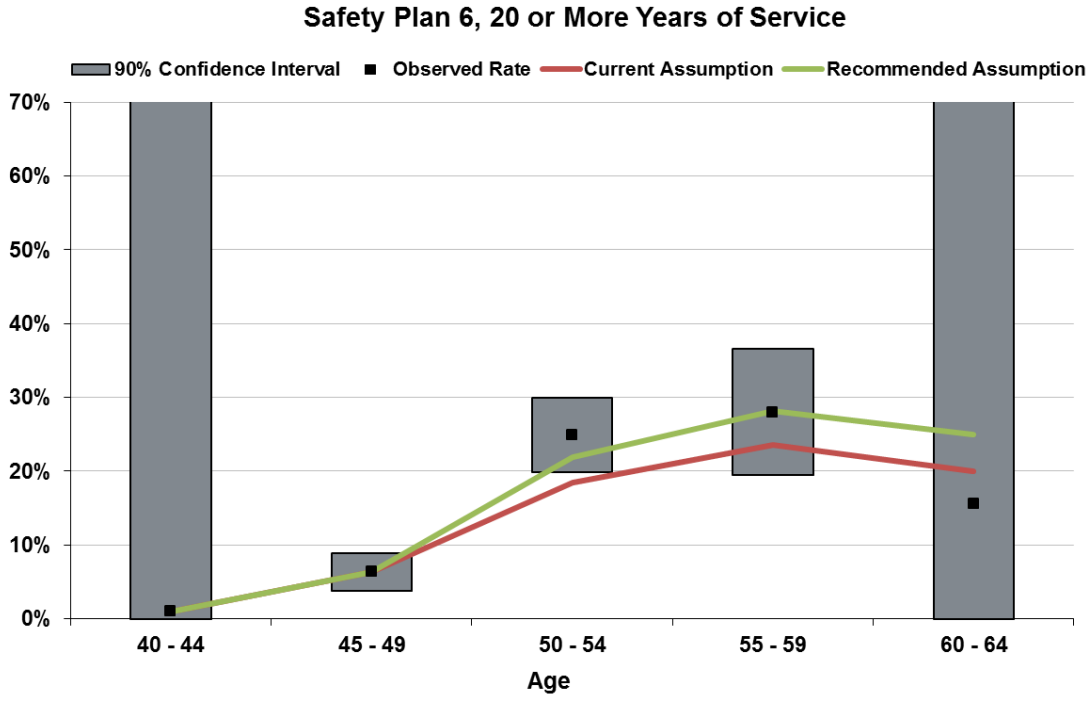
Table III-R6 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety Plan 6 members with 20 or more years of service. Chart III-R6 shows the information graphically along with the 90% confidence interval.

The data shows higher actual retirement rates than expected under the current assumption. The proposed assumption increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio from 119% to 103%. The r-squared increases from 0.91 to 0.94.

**Table III-R6 – Safety**

| Safety Plan 6, 20 or More Years of Service | | | | | | |
|---|---|---|---|---|---|---|
| | | Retirements | | | Actual to Expected Ratios | |
| Age | Exposures | Actual | Current | Recommended | Current | Recommended |
| 40 - 44 | 98 | 1 | 1.0 | 1.0 | 102% | 102% |
| 45 - 49 | 251 | 16 | 15.8 | 15.8 | 101% | 101% |
| 50 - 54 | 197 | 49 | 36.4 | 43.2 | 135% | 113% |
| 55 - 59 | 75 | 21 | 17.6 | 21.2 | 119% | 99% |
| 60 - 64 | 32 | 5 | 6.4 | 8.0 | 78% | 63% |
| **Total** | **653** | **92** | **77.26** | **89.17** | **119%** | **103%** |
| **R-squared** | | | **0.913** | **0.944** | | |

**Chart III-R6 – Safety**




See Appendices A and B for a full listing of the proposed and prior rates. The ultimate retirement age remains at 65.

## 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.

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

The data shows actual termination rates close to expected under the current assumption. We are recommending modest reductions in the General termination rates for some members with 10 to 19 years of service and modest increases in the General termination rates for those members with more than 20 years of service. The proposed assumption nearly maintains the aggregate assumed rates of termination and the aggregate A/E ratio of 99%. The r-squared also remains at 0.99. We note that because the number of terminations and exposures is quite high, a higher degree of credibility can be assigned to the termination experience, and therefore we are comfortable recommending assumptions that align closely with the data.

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

**Table III-T1**

| Termination Rates - General | | | | | | |
|---|---|---|---|---|---|---|
| | | Terminations | | | Actual to Expected Ratios | |
| Service | Exposures | Actual | Current | Recommended | Current | Recommended |
| 0 - 4 | 7,722 | 889 | 916.6 | 916.6 | 97% | 97% |
| 5 - 9 | 7,061 | 386 | 377.0 | 377.0 | 102% | 102% |
| 10 - 14 | 3,570 | 124 | 131.9 | 125.4 | 94% | 99% |
| 15 - 19 | 1,896 | 36 | 40.4 | 37.4 | 89% | 96% |
| 20 - 24 | 945 | 21 | 9.5 | 14.2 | 222% | 148% |
| 25 - 29 | 290 | 7 | 2.9 | 4.4 | 241% | 161% |
| **Total** | **21,484** | **1,463** | **1,478.2** | **1,474.9** | **99%** | **99%** |
| **R-squared** | | | **0.991** | **0.992** | | |

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### TERMINATION RATES

**Chart III-T1**

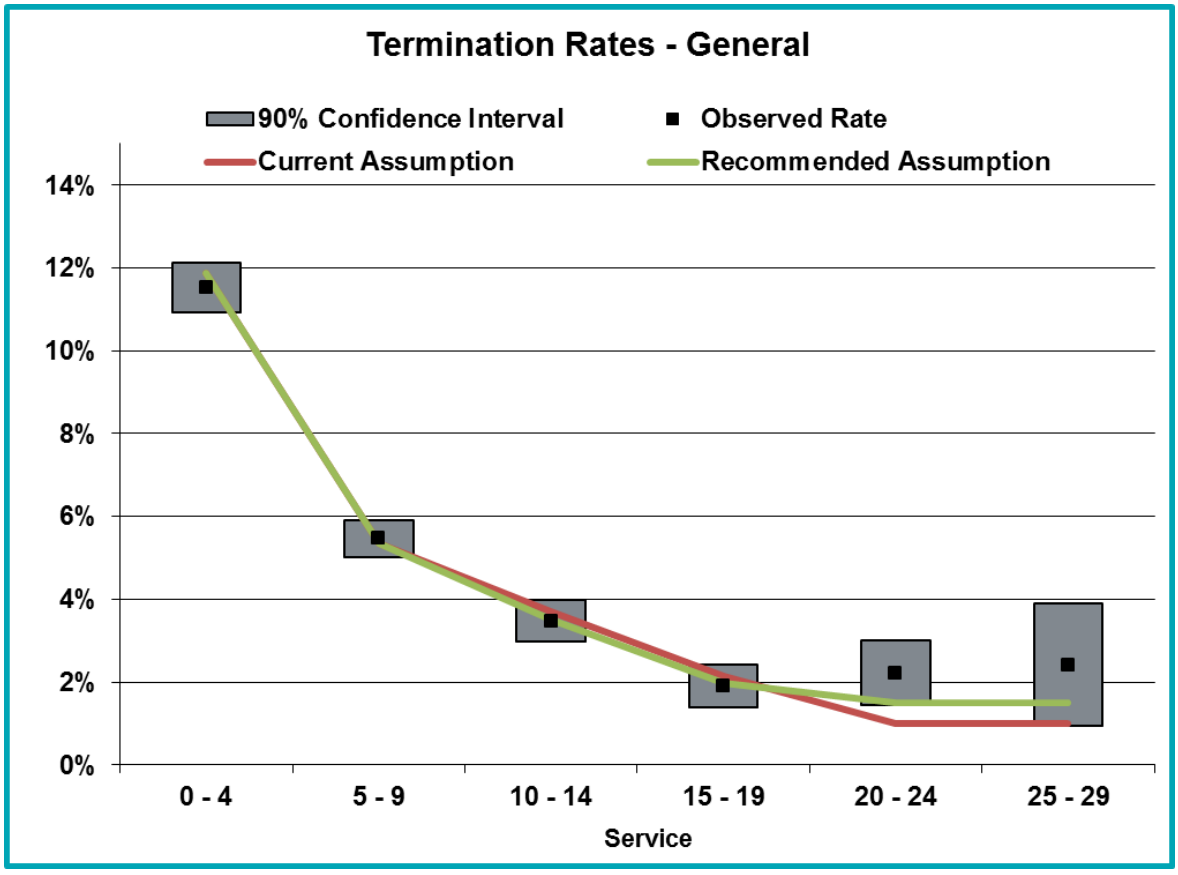



Table III-T2 shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart III-T2 shows the information graphically along with the 90% confidence interval.

The data shows that actual termination rates are slightly higher when a member has between four and seven years of service. In aggregate, the proposed assumptions increase the assumed rates of termination and slightly decreases the aggregate A/E ratio from 102% to 101%. The r-squared increases from 0.86 to 0.94.

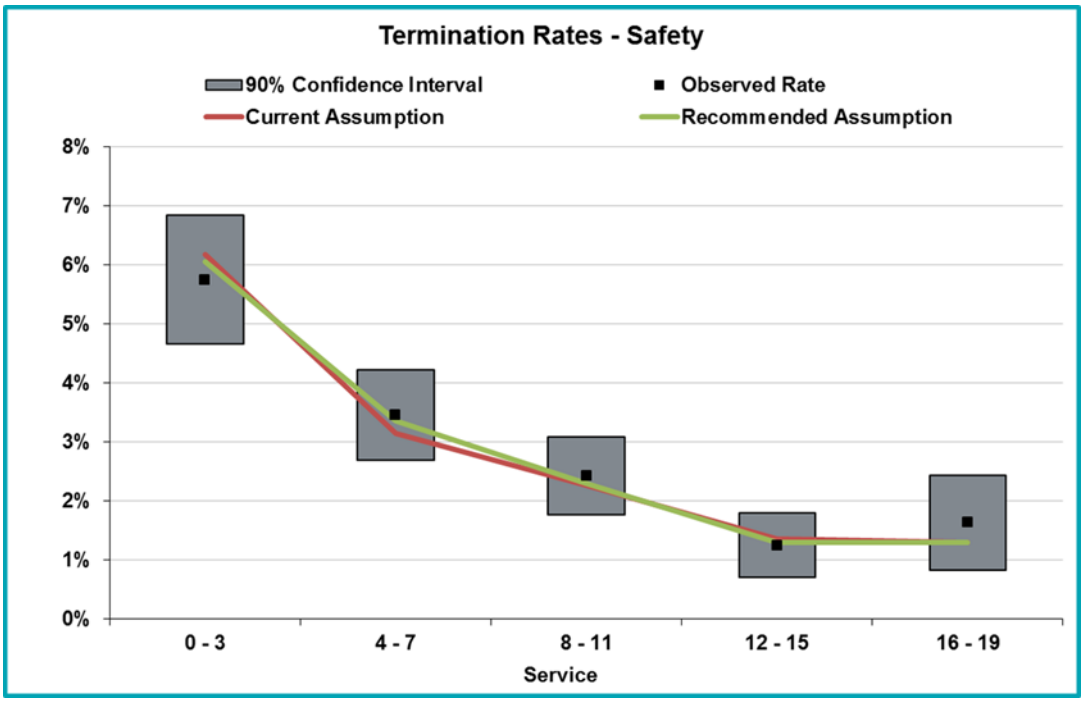
See Appendices A and B for a full listing of the proposed and prior rates.

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### TERMINATION RATES

### Table III-T2

| Termination Rates - Safety | | | | | | |
|---|---|---|---|---|---|---|
| | | Terminations | | | Actual to Expected Ratios | |
| Service | Exposures | Actual | Current | Recommended | Current | Recommended |
| 0 - 3 | 1,236 | 71 | 76.4 | 74.8 | 93% | 95% |
| 4 - 7 | 1,535 | 53 | 48.2 | 51.5 | 110% | 103% |
| 8 - 11 | 1,485 | 36 | 33.6 | 34.0 | 107% | 106% |
| 12 - 15 | 1,125 | 14 | 15.2 | 14.6 | 92% | 96% |
| 16 - 19 | 673 | 11 | 8.7 | 8.7 | 126% | 126% |
| **Total** | **6,054** | **185** | **182.2** | **183.7** | **102%** | **101%** |
| **R-squared** | | | **0.864** | **0.943** | | |

### Chart III-T2



# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## TERMINATION RATES

### Refund Rates and Reciprocity

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

Table III-T3 shows the results of our analysis of refunds for General and Safety members for the period July 1, 2013 through June 30, 2016. We are recommending decreasing the refund assumption at all levels of service for both General and Safety. We are also recommending decreasing the percentage of reciprocal transfers based on the total non-refund terminations from 50% to 30% for both General and Safety. We are not recommending decreasing these rates to the full extent of the experience since it is only based on the most recent three years, and some individuals may not report that they have transferred to a reciprocal employer until the very end of their career. We will monitor this assumption in future experience studies and if we continue to see decreasing refund and reciprocal transfer rates we will adjust the rates accordingly.

**Table III-T3**

| Service | Total Terminations | Refunds | % of Total | Current Assumption | Proposed Assumption | Non-Refund Terminations | Reciprocal Transfers | % of Total | Current Assumption | Proposed Assumption |
|---|---|---|---|---|---|---|---|---|---|---|
| **General** | | | | | | | | | | |
| 0 - 4 | 480 | 450 | 94% | 100% | 100% | | | | | |
| 5 - 9 | 260 | 35 | 13% | 30% | 20% | | | | | |
| 10 - 14 | 79 | 8 | 10% | 20% | 15% | | | | | |
| 15 - 19 | 33 | 3 | 9% | 15% | 10% | | | | | |
| 20 - 24 | 15 | 0 | 0% | 15% | 5% | | | | | |
| 25 - 29 | 3 | 1 | 33% | 0% | 0% | | | | | |
| **Total** | 870 | 497 | 57% | | | 373 | 59 | 16% | 50% | 30% |
| **Safety** | | | | | | | | | | |
| 0 - 4 | 37 | 31 | 84% | 100% | 100% | | | | | |
| 5 - 9 | 40 | 6 | 15% | 30% | 20% | | | | | |
| 10 - 14 | 13 | 1 | 8% | 15% | 10% | | | | | |
| 15 - 19 | 8 | 1 | 13% | 15% | 10% | | | | | |
| **Total** | 98 | 39 | 40% | | | 59 | 10 | 17% | 50% | 30% |

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### TERMINATION RATES

Table III-T4 shows the results of our analysis of the age at which vested terminated and reciprocal transfer members decide to retire. We are only recommending changes to the Safety Plan 6 assumption from a commencement age of 50 to 52. The average age at commencement of a vested terminated Safety member is 52 while the average transfer retirement age is 55. It is not necessary to have separate retirement rates for the different types of inactive terminated members especially since the liability impact of the transfers would not be material at a retirement age of 55.

**Table III-T4**

**Average Retirement Age for Retirees from Vested Status**

| | General Plans 5 & 7, APCD | | General Plan 2 | | Safety Plan 4 | | Safety Plan 6 | |
|---|---|---|---|---|---|---|---|---|
| FYE | New Retirees | Retirement Age | New Retirees | Retirement Age | New Retirees | Retirement Age | New Retirees | Retirement Age |
| 2014 | 43 | 57.2 | 1 | 66.0 | 1 | 58.0 | 3 | 53.0 |
| 2015 | 36 | 59.9 | 1 | 62.0 | 4 | 53.5 | 5 | 50.4 |
| 2016 | 40 | 59.8 | 0 | 0.0 | 2 | 55.5 | 5 | 53.8 |
| Total | 119 | 58.9 | 2 | 64.0 | 7 | 54.7 | 13 | 52.3 |
| Current Assumption: | | 58 | | 65 | | 55 | | 50 |
| Proposed Assumption: | | 58 | | 65 | | 55 | | 52 |

As stated on the previous page, if a member terminates employment and works for a reciprocal employer, the member's retirement benefit is ultimately computed using the highest Final Compensation based on employment any reciprocal employer. We recommend that the assumption used to project pay during employment with the reciprocal employer 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 assumptions for members in reciprocal status are 3.25% for General members and 3.50% for Safety members.

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### DISABILITY RATES

This section analyzes the incidence of disability by the age of the employee. It is assumed that 40% of General and 90% of the Safety disabilities are service-related. All disabilities for members with less than five years of service are assumed to be service-related. We reviewed the experience for the past thirteen years (2003-2016) and found that these assumptions match closely with the actual frequency of service versus non-service related disabilities during this period, therefore we are not recommending any changes to these assumptions.

The amount of disability experience is fairly limited; only eleven 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 members, and Chart III-D1 shows the information graphically. The 90% confidence interval is not shown because of a lack of credible data.

The data shows disability rates that are lower than the current assumption. In aggregate, the proposed assumptions decrease the assumed rates of disability. The proposal increases the aggregate A/E ratio from 54% to 86%. The r-squared also increases from 0.18 to 0.19. We did not recommend a change to move the aggregate A/E ratio closer to 100% due to the lack of data.

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

**Table III-D1**

| General Disability Incidence Rates | | | | | | |
|---|---|---|---|---|---|---|
| Age Band | Exposures | Disabilities | | | Actual to Expected Ratios | |
| | | Actual | Current | Recommended | Current | Recommended |
| 20 - 29 | 1,511 | 0 | 0.2 | 0.2 | 0% | 0% |
| 30 - 39 | 4,300 | 1 | 0.4 | 0.6 | 233% | 166% |
| 40 - 49 | 5,377 | 3 | 3.0 | 2.5 | 100% | 120% |
| 50 - 59 | 6,072 | 4 | 10.0 | 5.1 | 40% | 78% |
| 60 - 69 | 2,179 | 2 | 5.0 | 3.3 | 40% | 61% |
| 70 + | 31 | 0 | 0.1 | 0.0 | 0% | 0% |
| **Total** | **19,470** | **10** | **19** | **12** | **54%** | **86%** |
| **R-squared** | | | **0.177** | **0.186** | | |

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### DISABILITY RATES

**Chart III-D1**

**General Disability Incidence**

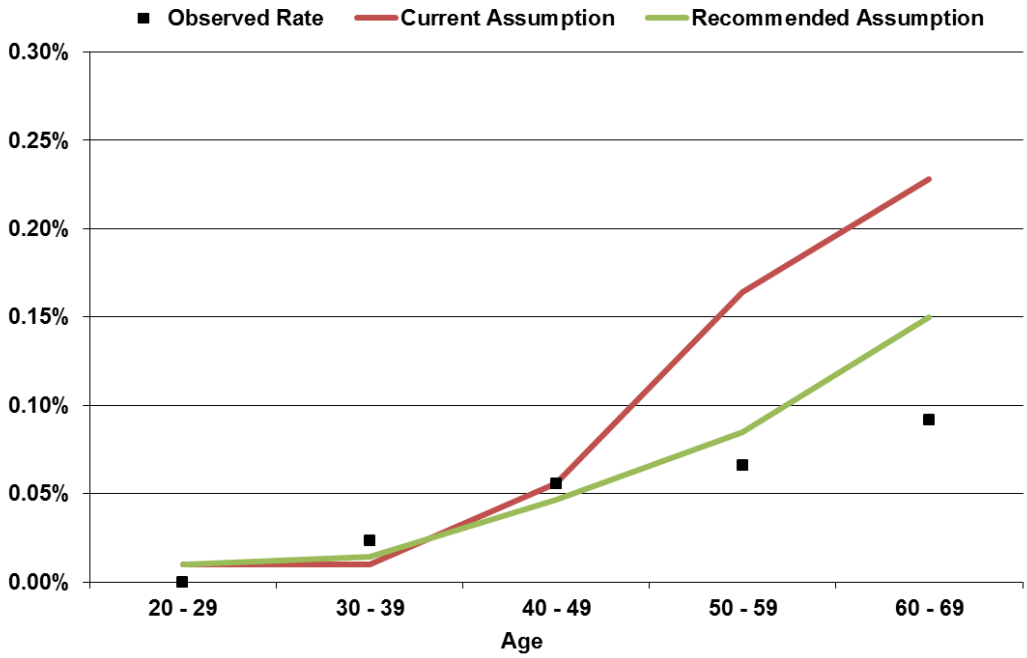



Table III-D2 on the next page shows the calculation of actual-to-expected ratios and the r-squared statistic for Safety members, and Chart III-D2 shows the information graphically. The 90% confidence interval is not shown because of a lack of credible data.

The data shows that the number of disabilities is slightly lower than the number expected under the current assumption. In aggregate, the proposed assumptions decrease the assumed rates of disability. The proposal increases the aggregate A/E ratio from 80% to 91%. The r-squared also increases from 0.29 to 0.31.

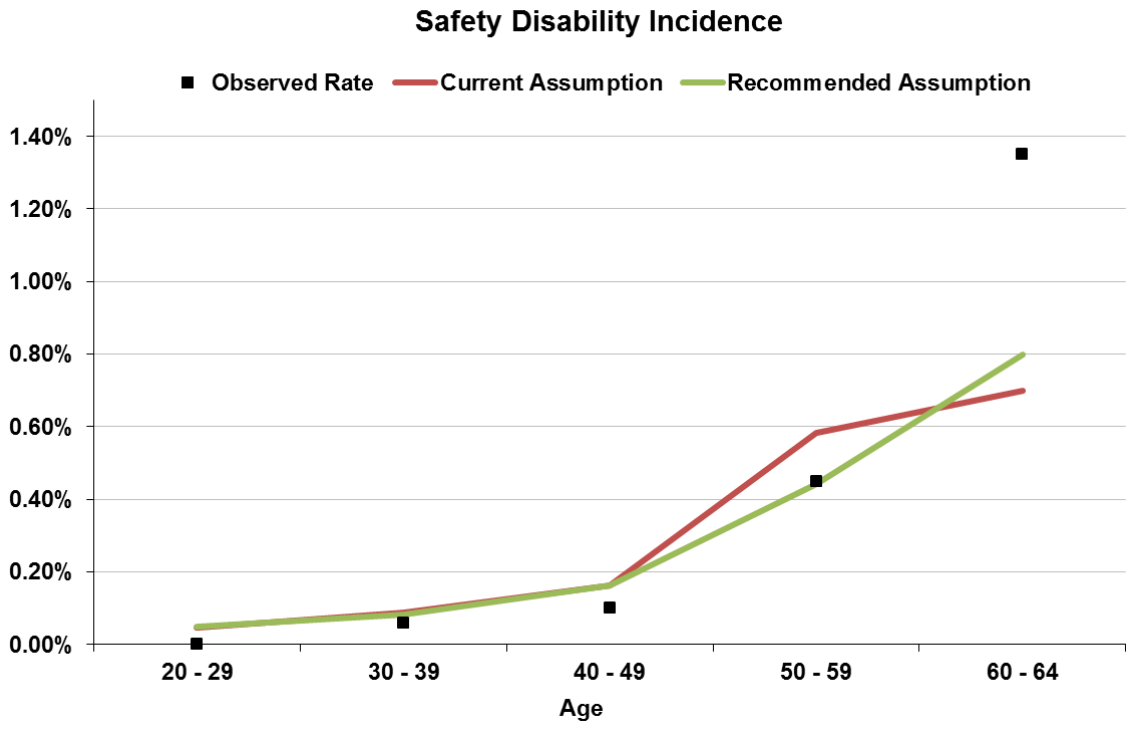
See Appendix A or B for a full listing of the rates.

# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## DISABILITY RATES

### Table III-D2

| Safety Disability Incidence Rates | | | | | | |
|---|---|---|---|---|---|---|
| Age Band | Exposures | Disabilities | | | Actual to Expected Ratios | |
| | | Actual | Current | Recommended | Current | Recommended |
| 20 - 29 | 419 | 0 | 0.2 | 0.2 | 0% | 0% |
| 30 - 39 | 1,737 | 1 | 1.5 | 1.4 | 65% | 71% |
| 40 - 49 | 1,999 | 2 | 3.3 | 3.3 | 61% | 61% |
| 50 - 59 | 1,112 | 5 | 6.5 | 4.9 | 77% | 102% |
| 60 - 64 | 148 | 2 | 1.0 | 1.2 | 194% | 169% |
| **Total** | **5,415** | **10.0** | **12.5** | **11.0** | **80%** | **91%** |
| **R-squared** | | | **0.294** | **0.307** | | |

### Chart III-D2



# 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 SBCERS.
2. Compare actual SBCERS 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 SBCERS experience. This adjusted table is called the base table.
4. Select an appropriate standard mortality improvement projection scale and apply it to the base table.

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

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 SBCERS. 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.

# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## MORTALITY RATES

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

**Healthy active members, retirees, and beneficiaries**

- The Combined Healthy Retired Pensioners (RP) 2000 tables published by the Society of Actuaries, with generational projection using Projection Scale BB.

**Disabled members**

- The Combined Healthy Retired Pensioners (RP) 2000 tables published by the Society of Actuaries, with generational projection using Projection Scale BB, set-forward five 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 SBCERS. As part of an Experience Study completed in 2014, CalPERS adopted a new set of mortality tables for active, retired, and disabled members. SBCERS's experience over the past six 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 the six-year period (2010-2016).

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

Even with the use of six years of data, the SBCERS experience is only partially credible, based on standard statistical theory. We therefore recommend partially adjusting the CalPERS base tables to fit SBCERS's experience to develop a new base table. The rates for each age in the standard table are adjusted by a factor, where the factor is determined by multiplying the actual-to-expected ratio for the group (such as male retirees) by a credibility factor (approximately 50% for both males and females) 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. 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. To perform our comparisons, the CalPERS base rates (without projection) were projected from their base year (2009) to the midpoint of the combined six-year study period (2013).

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

**Active members**

- CalPERS Preretirement Non-Industrial Mortality, with no adjustment (General and Safety).
- CalPERS Preretirement Industrial Mortality, with no adjustment (Safety only).

**Healthy retirees and beneficiaries**

- CalPERS Healthy Annuitant Mortality, adjusted by 95% for males and 90% for females.

**Disabled members**

- CalPERS Industrially Disabled Annuitant Mortality, with no adjustment (Safety only)
- CalPERS Non-Industrially Disabled Annuitant Mortality, with no adjustment (General only).

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

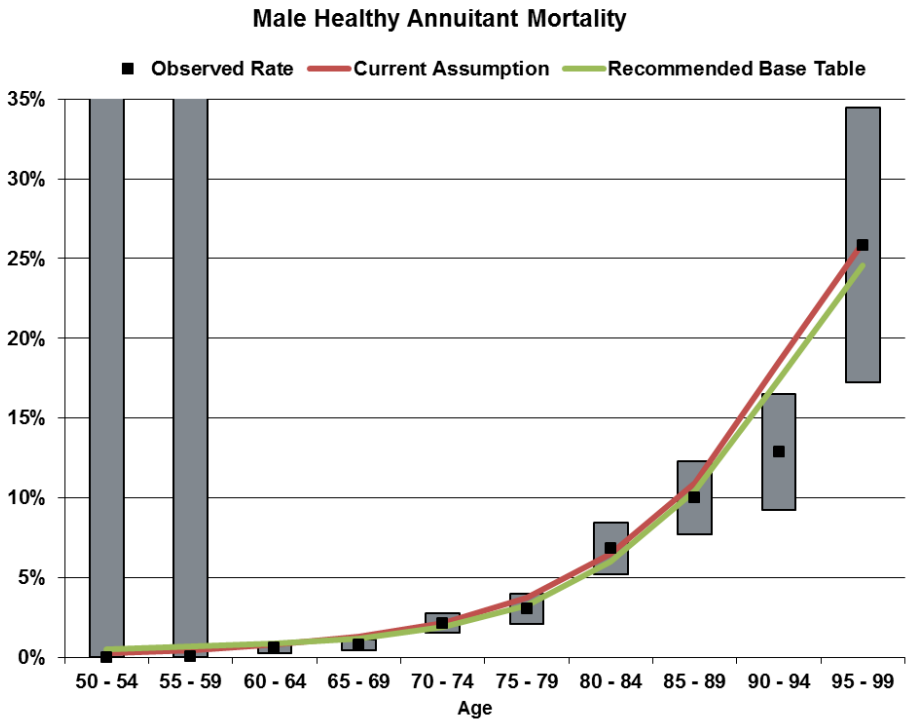
As shown in Tables III-M1 and III-M2 on the following pages, our proposed mortality rates for healthy annuitants are slightly lower than recent experience (reflecting an A/E ratio of 88%). As described above, we applied a partial adjustment to the healthy retiree mortality rates to bring the A/E rates closer to 100%, but not all the way to 100%, because the SBCERS data cannot be considered fully credible. 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, and because the mortality experience for SBCERS – especially for females – showed remarkable improvement within the last three years compared to the prior three years, which could indicate a level of statistical fluctuation within the data.

# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## MORTALITY RATES

### Table III-M1

| Male Healthy Annuitant Mortality | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age Band | Exposures | Actual Deaths | Weighted Exposures | Weighted Deaths | | | | Actual to Expected Ratios | | |
| | | | | Actual | Current | Standard | Recommended | Current | Standard | Recommended |
| 50 - 59 | 1,317 | 1 | 5,527,149 | 999 | 23,314 | 37,051 | 35,198 | 4% | 3% | 3% |
| 60 - 69 | 3,655 | 31 | 16,604,990 | 117,640 | 182,326 | 181,651 | 172,568 | 65% | 65% | 68% |
| 70 - 79 | 2,417 | 63 | 8,838,043 | 214,701 | 233,636 | 217,003 | 206,153 | 92% | 99% | 104% |
| 80 - 89 | 1,133 | 94 | 2,817,041 | 226,296 | 229,968 | 227,713 | 216,327 | 98% | 99% | 105% |
| 90 - 99 | 300 | 53 | 599,905 | 93,723 | 120,594 | 119,614 | 113,634 | 78% | 78% | 82% |
| 100 + | 3 | 2 | 1,529 | 1,529 | - | 511 | 486 | 0% | 299% | 315% |
| **Total** | **8,825** | **244** | **34,388,657** | **654,888** | **789,838** | **783,543** | **744,366** | **83%** | **84%** | **88%** |

### Chart III-M1

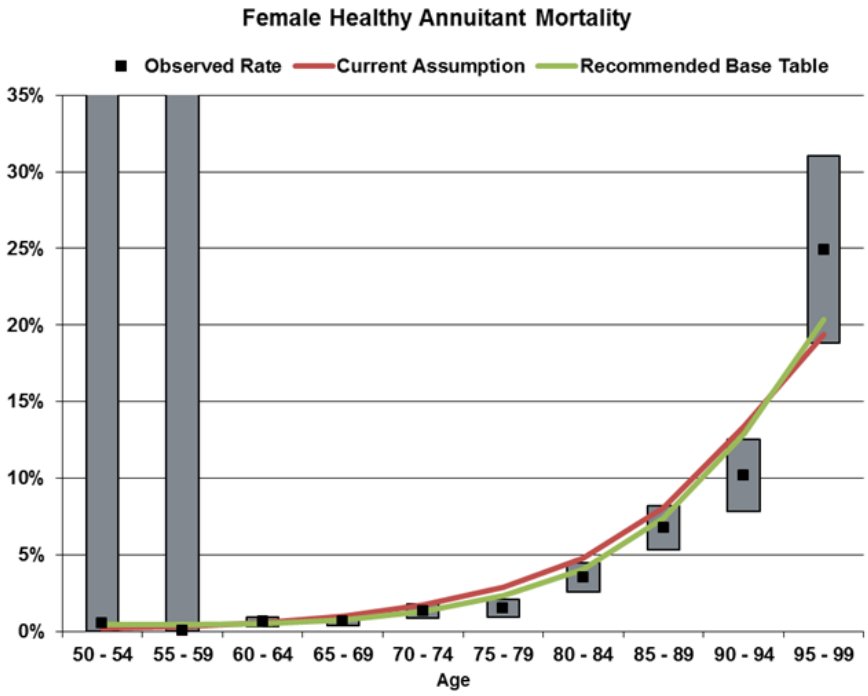


# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## MORTALITY RATES

### Table III-M2

| Female Healthy Annuitant Mortality | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age Band | Exposures | Actual Deaths | Weighted Exposures | Weighted Deaths | | | | Actual to Expected Ratios | | |
| | | | | Actual | Current | Standard | Recommended | Current | Standard | Recommended |
| 50 - 59 | 1,596 | 4 | 2,939,293 | 5,867 | 8,530 | 14,198 | 12,778 | 69% | 41% | 46% |
| 60 - 69 | 3,906 | 30 | 9,693,530 | 63,134 | 80,952 | 72,325 | 65,093 | 78% | 87% | 97% |
| 70 - 79 | 2,687 | 44 | 5,289,344 | 74,417 | 115,714 | 101,199 | 91,079 | 64% | 74% | 82% |
| 80 - 89 | 1,850 | 95 | 3,029,556 | 148,212 | 187,433 | 184,601 | 166,141 | 79% | 80% | 89% |
| 90 - 99 | 591 | 100 | 904,904 | 119,400 | 132,109 | 145,051 | 130,546 | 90% | 82% | 91% |
| 100 + | 35 | 6 | 19,938 | 3,354 | - | 6,178 | 5,560 | 0% | 54% | 60% |
| **Total** | **10,665** | **279** | **21,876,565** | **414,385** | **524,738** | **523,552** | **471,196** | **79%** | **79%** | **88%** |

### Chart III-M2



## 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 – 85 total disabled deaths and 92 total active deaths – over the six 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 with SBCERS-specific adjustments) projected using Scale MP-2016 from 2009 to 2039. 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 35%/65% for General Members and 80%/20% 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.

# SECTION III – DEMOGRAPHIC ASSUMPTIONS
## OTHER DEMOGRAPHIC ASSUMPTIONS

### SICK LEAVE SERVICE CREDIT

Upon retirement, members are entitled to turn their sick leave balances into service credit for retirement benefits, limited to one year of service credit. The current assumption is that members' converted sick leave balances are equivalent to 1.34% of their service at retirement. The analysis in Table III-O1 shows that the current sick leave load assumption is close to the average amount of sick leave as a percentage of the average service, 1.40%, for all actives eligible to retire as of June 30, 2016. However, we are recommending different assumptions for the General and Safety members since there is a material variance between the groups. We propose a sick leave load of 1.25% for General members and 2.00% for Safety members, to be applied to all service-retirement benefits. The load is not applied to death, disability or early termination benefits.

**Table III-O1**

| | Count | Avg Years of Service | Avg Sick Leave Hours | Avg Add'l Service | Percent Increase |
|---|---|---|---|---|---|
| General | 1,230 | 19.1 | 496 | 0.2 | 1.25% |
| Safety | 285 | 21.7 | 906 | 0.4 | 2.00% |
| Total | 1,515 | 19.6 | 573 | 0.3 | 1.40% |

### FAMILY COMPOSITION

The current assumption is that 75% of active male and 55% of active female SBCERS participants will have beneficiaries eligible for an unreduced (i.e., subsidized) 60% Joint and Survivor allowance (100% for Duty Disability). This assumption will also be applied to determine the number of active members eligible for a pre-retirement surviving spouse death benefit.

Table III-O2 shows the results of the analysis during the experience study period for members who retired or became disabled.

**Table III-O2**

| Percent of Retired and Disabled Members with Spouses or Domestic Partners | | | | | | |
|---|---|---|---|---|---|---|
| | FEMALES | | | MALES | | |
| Valuation Year | Disabled and Retirees | Eligible Spouses | Percent Eligible | Disabled and Retirees | Eligible Spouses | Percent Eligible |
| 2014 | 79 | 42 | 53% | 65 | 54 | 83% |
| 2015 | 98 | 57 | 58% | 87 | 74 | 85% |
| 2016 | 107 | 58 | 54% | 80 | 59 | 74% |
| Total | 284 | 157 | 55% | 232 | 187 | 81% |

## SECTION III – DEMOGRAPHIC ASSUMPTIONS
### OTHER DEMOGRAPHIC ASSUMPTIONS

We do not recommend changing the current assumptions. Even though the married percentage for males over the most recent three year period is 81%, the most recent data during FYE 2016 only showed 74% of retired males had eligible spouses. Also, in the previous experience study, the percentage was reduced from 80% to 75%. We will continue to monitor this assumption in the next study.

The current assumption is that male members are three years older than their spouses and female members are assumed to be two years younger than their spouses. Table III-O3 compiles the average age difference for retired or disabled members between spouses and domestic partners. This information is used to predict spouse information for future retirees. We recommend no change to the age difference assumptions. In the previous experience study we changed the female member's age difference from three years younger to two years younger. We will continue to closely analyze the trend in this assumption in the next experience study.

**Table III-O3**

| Age Difference Between Retired or Disabled Members and Spouses or Domestic Partners | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | FEMALES | | | | MALES | | | |
| Valuation Year | Eligible Spouses | Member Age | Spouse Age | Difference | Eligible Spouses | Member Age | Spouse Age | Difference |
| 2014 | 42 | 59.8 | 60.0 | (0.2) | 54 | 61.8 | 59.8 | 2.0 |
| 2015 | 57 | 61.2 | 63.9 | (2.7) | 74 | 61.3 | 58.1 | 3.2 |
| 2016 | 58 | 60.4 | 60.0 | 0.4 | 59 | 58.7 | 55.4 | 3.3 |
| Total | 99 | 60.5 | 61.4 | (0.9) | 187 | 60.6 | 57.7 | 2.9 |

## PLAN EXPENSES

An allowance of $4,400,000 for Plan administrative expenses was included in the annual cost calculation in the prior valuation, and was expected to increase with the assumed wage inflation of 3.50% to $4,554,000. The actual Plan administrative expenses for FYE 2016 were $5,192,806 due to a non-recurring spike in technology improvements. Adjusting for gradual technology spending and assumed expense growth equal to wage inflation, we recommend assumed Plan administrative expenses of $5,100,000 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 wage inflation (by 3.00% per year) in future years.

# APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

The recommended assumptions were adopted by the Board at their October 26, 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 7.00% net of investment expenses.

## 2. Administrative Expenses

Administrative expenses are assumed to be $5.1 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 the assumed wage inflation of 3.00% each year.

## 3. Cost-of-Living

The cost-of-living as measured by the Consumer Price Index (CPI) will increase at the rate of 2.75% per year.

## 4. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.6% per year for General Plans 5, Safety Plans 4, 6, and 8 (PEPRA), and APCD Plans 1 and 2; 1.90% per year for General Plans 7 and APCD Plan 8 (PEPRA), and 0% per year for General Plan 2.

For General Plan 8 (PEPRA), benefits are assumed to increase at the rate of 1.90% per year if their employer had implemented General Plan 7 prior to January 1, 2013. Otherwise, benefits are assumed to increase at the rate of 2.6% per year.

## 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 after retirement.

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

The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 7. Social Security Wage Base

General Plan 2 members have their benefits offset by an assumed Social Security Benefit. For projecting the Social Security Benefit, the annual Social Security Wage Base increase is assumed to be 2.75% per year. This assumption is also used for increasing the compensation limit that applies to PEPRA members.

### 8. Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 3.75%. As of June 30, 2008, the credited interest rate each six-month period is the semi-annual yield of the five-year Treasury note as of the last business day of the interest-crediting period.

### 9. Sick Leave Service Credit Upon Retirement

Upon retirement, members are entitled to turn their sick leave balances into service credit for retirement benefits. Members are limited to one year of service credit. For safety plan members, a 2.00% load was applied to the expected years of service at retirement for sick leave service credit. For general plan members, the load was 1.25%.

### 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 two years younger than their spouses.

| Percentage Married | |
|---|---|
| Gender | Percentage |
| Males | 75% |
| Females | 55% |

### 11. Vacation Cashout

Any cashouts of vacation during the final average salary period affecting the calculation of a retirement benefit are recognized at the time of retirement. There is no prerecognition of potential costs included in the valuation.

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 12. Increases in Pay

Wage inflation component: 3.00%
Additional longevity and promotion component:

| Longevity and Promotion Increases | | |
|---|---|---|
| Service | General | Safety |
| 0 | 4.75% | 6.00% |
| 1 | 4.00% | 5.00% |
| 2 | 3.25% | 4.00% |
| 3 | 2.50% | 3.25% |
| 4 | 2.00% | 2.50% |
| 5 | 1.50% | 2.00% |
| 6 | 1.25% | 1.60% |
| 7 | 1.00% | 1.30% |
| 8 | 0.90% | 1.20% |
| 9 | 0.80% | 1.10% |
| 10 | 0.78% | 1.00% |
| 11 | 0.75% | 0.95% |
| 12 | 0.70% | 0.92% |
| 13 | 0.65% | 0.89% |
| 14 | 0.60% | 0.87% |
| 15 | 0.55% | 0.85% |
| 16 | 0.50% | 0.82% |
| 17 | 0.48% | 0.80% |
| 18 | 0.46% | 0.77% |
| 19 | 0.44% | 0.74% |
| 20 | 0.42% | 0.72% |
| 21 | 0.40% | 0.69% |
| 22 | 0.38% | 0.67% |
| 23 | 0.36% | 0.64% |
| 24 | 0.34% | 0.62% |
| 25 | 0.32% | 0.59% |
| 26 | 0.30% | 0.57% |
| 27 | 0.28% | 0.54% |
| 28 | 0.26% | 0.52% |
| 29 | 0.25% | 0.50% |
| 30+ | 0.25% | 0.50% |

** Increases are compound rather than additive.*

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 13. Rates of Termination

Sample rates of termination are shown in the following table below. The 1.30% rate of termination continues for Safety PEPRA members with 20 or more years of service who are not eligible to retire.

| Rates of Termination | | |
|---|---|---|
| Service | General | Safety |
| 0 | 20.00% | 9.00% |
| 1 | 14.00% | 9.00% |
| 2 | 10.00% | 3.50% |
| 3 | 8.00% | 3.00% |
| 4 | 7.00% | 3.00% |
| 5 | 6.00% | 5.00% |
| 6 | 6.00% | 2.75% |
| 7 | 5.00% | 2.75% |
| 8 | 5.00% | 2.75% |
| 9 | 4.50% | 2.75% |
| 10 | 4.50% | 2.00% |
| 11 | 3.50% | 1.50% |
| 12 | 3.50% | 1.30% |
| 13 | 3.00% | 1.30% |
| 14 | 2.50% | 1.30% |
| 15 | 2.50% | 1.30% |
| 16 | 2.50% | 1.30% |
| 17 | 1.50% | 1.30% |
| 18 | 1.50% | 1.30% |
| 19 | 1.50% | 1.30% |
| 20 | 1.50% | 0.00% |
| 21 | 1.50% | |
| 22 | 1.50% | |
| 23 | 1.50% | |
| 24 | 1.50% | |
| 25 | 1.50% | |
| 26 | 1.50% | |
| 27 | 1.50% | |
| 28 | 1.50% | |
| 29 | 1.50% | |
| 30 | 0.00% | |

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

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 14. Withdrawal

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

| Rates of Withdrawal | | |
|---|---|---|
| Service | General | Safety |
| 0 | 100.00% | 100.00% |
| 1 | 100.00% | 100.00% |
| 2 | 100.00% | 100.00% |
| 3 | 100.00% | 100.00% |
| 4 | 100.00% | 100.00% |
| 5 | 20.00% | 20.00% |
| 6 | 20.00% | 20.00% |
| 7 | 20.00% | 20.00% |
| 8 | 20.00% | 20.00% |
| 9 | 20.00% | 20.00% |
| 10 | 15.00% | 10.00% |
| 11 | 15.00% | 10.00% |
| 12 | 15.00% | 10.00% |
| 13 | 15.00% | 10.00% |
| 14 | 15.00% | 10.00% |
| 15 | 10.00% | 10.00% |
| 16 | 10.00% | 10.00% |
| 17 | 10.00% | 10.00% |
| 18 | 10.00% | 10.00% |
| 19 | 10.00% | 10.00% |
| 20 | 5.00% | 0.00% |
| 21 | 5.00% | 0.00% |
| 22 | 5.00% | 0.00% |
| 23 | 5.00% | 0.00% |
| 24 | 5.00% | 0.00% |
| 25 | 0.00% | 0.00% |
| 26 | 0.00% | 0.00% |
| 27 | 0.00% | 0.00% |
| 28 | 0.00% | 0.00% |
| 29 | 0.00% | 0.00% |
| 30 | 0.00% | 0.00% |

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

Former members with contributions on deposit are assumed to receive a retirement benefit commencing at the following ages:

| | |
|---|---|
| General Plans 5, 7, and 8 (PEPRA) Members: | Age 58 |
| General Plan 2 Members: | Age 65 |
| Safety Plans 4 and 8 (PEPRA) Members: | Age 54 |
| Safety Plan 6 Members: | Age 52 |
| APCD Members: | Age 58 |

### 15. Reciprocal Transfers

30% of vested terminated General (except Plan 2) and Safety Members that leave their member contributions on deposit with the Plan are assumed to be reciprocal.

Reciprocal members are assumed to remain with the reciprocal agency until retirement, and receive annual salary increases of:

| | |
|---|---|
| General & APCD Members: | 3.25% |
| Safety Members: | 3.50% |

# APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

## 16. Rates of Disability

Disability rates of active participants are shown below.

| Rates of Disability | | | | |
|---|---|---|---|---|
| | General Years of Service | | Safety Years of Service | |
| Age | Less than 5 | 5 or More | Less than 5 | 5 or More |
| 29 or less | 0.004% | 0.010% | 0.045% | 0.050% |
| 30 | 0.004% | 0.010% | 0.054% | 0.060% |
| 31 | 0.004% | 0.010% | 0.054% | 0.060% |
| 32 | 0.004% | 0.010% | 0.054% | 0.060% |
| 33 | 0.004% | 0.010% | 0.054% | 0.060% |
| 34 | 0.004% | 0.010% | 0.054% | 0.060% |
| 35 | 0.004% | 0.010% | 0.090% | 0.100% |
| 36 | 0.008% | 0.020% | 0.090% | 0.100% |
| 37 | 0.008% | 0.020% | 0.090% | 0.100% |
| 38 | 0.008% | 0.020% | 0.090% | 0.100% |
| 39 | 0.008% | 0.020% | 0.090% | 0.100% |
| 40 | 0.008% | 0.020% | 0.117% | 0.130% |
| 41 | 0.008% | 0.020% | 0.117% | 0.130% |
| 42 | 0.012% | 0.030% | 0.117% | 0.130% |
| 43 | 0.016% | 0.040% | 0.117% | 0.130% |
| 44 | 0.020% | 0.050% | 0.117% | 0.130% |
| 45 | 0.024% | 0.060% | 0.135% | 0.150% |
| 46 | 0.024% | 0.060% | 0.162% | 0.180% |
| 47 | 0.024% | 0.060% | 0.180% | 0.200% |
| 48 | 0.024% | 0.060% | 0.225% | 0.250% |
| 49 | 0.024% | 0.060% | 0.225% | 0.250% |
| 50 | 0.028% | 0.070% | 0.252% | 0.280% |
| 51 | 0.028% | 0.070% | 0.270% | 0.300% |
| 52 | 0.028% | 0.070% | 0.450% | 0.500% |
| 53 | 0.028% | 0.070% | 0.450% | 0.500% |
| 54 | 0.028% | 0.070% | 0.450% | 0.500% |
| 55 | 0.040% | 0.100% | 0.450% | 0.500% |
| 56 | 0.040% | 0.100% | 0.450% | 0.500% |
| 57 | 0.040% | 0.100% | 0.450% | 0.500% |
| 58 | 0.040% | 0.100% | 0.450% | 0.500% |
| 59 | 0.040% | 0.100% | 0.450% | 0.500% |
| 60 | 0.060% | 0.150% | 0.720% | 0.800% |
| 61 | 0.060% | 0.150% | 0.720% | 0.800% |
| 62 | 0.060% | 0.150% | 0.720% | 0.800% |
| 63 | 0.060% | 0.150% | 0.720% | 0.800% |
| 64 | 0.060% | 0.150% | 0.720% | 0.800% |
| 65 | 0.060% | 0.150% | 0.000% | 0.000% |
| 66 | 0.060% | 0.150% | | |
| 67 | 0.060% | 0.150% | | |
| 68 | 0.060% | 0.150% | | |
| 69 | 0.060% | 0.150% | | |
| 70 | 0.060% | 0.150% | | |
| 71 | 0.060% | 0.150% | | |
| 72 | 0.060% | 0.150% | | |
| 73 | 0.060% | 0.150% | | |
| 74 | 0.060% | 0.150% | | |
| 75 | 0.000% | 0.000% | | |

40% of General disabilities and 90% of Safety disabilities where the member has five or more years of service are assumed to be service-related. All disabilities for those with less than five years or service are assumed to be service-related.

## APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

### 17. Rates of Mortality for Healthy Lives

Non-duty related mortality rates for active members are based on the sex distinct CALPERS Preretirement Non-Industrial Mortality Table, with no adjustment, with Generational improvement using Projection Scale MP-2016 from a base year of 2009. Safety members are also subject to the CALPERS Preretirement Industrial Mortality Table for duty-related deaths, with the same Generational improvements applied.

Mortality rates for retirees, beneficiaries, terminated vested members, and reciprocals are based on the sex distinct CALPERS Healthy Annuitant Tables adjusted by 0.95 for males and 0.90 for females, with Generational improvement using Projection Scale MP-2016 from a base year of 2009.

### 18. Rates of Mortality for Retired Disabled Lives

Mortality rates for disabled retirees are based on CalPERS Industrial Disabled Annuitant Mortality, with no adjustment (Safety only), CalPERS Non-Industrially Disabled Annuitant Mortality, with no adjustment (General only), with Generational improvement using Projection Scale MP-2016 from a base year of 2009.

# APPENDIX A – SUMMARY OF PROPOSED ASSUMPTIONS

## 19. Rates of Retirement

Rates of retirement are based on age according to the following table. The rates for Safety PEPRA members are the same as the Safety Plan 4 rates.

| Rates of Retirement | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Safety | | | |
| | General | | General - PEPRA | | Plan 4 | | Plan 6 | |
| Age | Svc < 30 | Svc >= 30 | Male | Female | Svc < 20 | Svc >= 20 | Svc < 20 | Svc >= 20 |
| < 34 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 35 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 36 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 37 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 38 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 39 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 40 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 41 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 42 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 43 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 44 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 45 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 1.00% |
| 46 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 2.00% |
| 47 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 5.00% |
| 48 | 0.00% | 4.00% | 0.00% | 0.00% | 0.00% | 1.00% | 0.00% | 5.00% |
| 49 | 0.00% | 4.00% | 0.00% | 0.00% | 0.00% | 3.00% | 0.00% | 17.00% |
| 50 | 3.00% | 4.00% | 0.00% | 0.00% | 4.00% | 4.00% | 20.00% | 25.00% |
| 51 | 3.00% | 4.00% | 0.00% | 0.00% | 4.00% | 4.00% | 15.00% | 15.00% |
| 52 | 3.00% | 4.00% | 2.40% | 1.80% | 4.00% | 4.00% | 15.00% | 20.00% |
| 53 | 3.00% | 4.00% | 2.40% | 1.80% | 5.00% | 5.00% | 15.00% | 20.00% |
| 54 | 3.00% | 5.00% | 2.40% | 5.40% | 10.00% | 20.00% | 15.00% | 30.00% |
| 55 | 5.00% | 10.00% | 2.40% | 5.40% | 10.00% | 35.00% | 25.00% | 35.00% |
| 56 | 5.00% | 10.00% | 3.60% | 5.40% | 10.00% | 20.00% | 15.00% | 25.00% |
| 57 | 7.00% | 10.00% | 3.60% | 5.40% | 10.00% | 25.00% | 15.00% | 25.00% |
| 58 | 7.00% | 10.00% | 3.60% | 5.40% | 10.00% | 25.00% | 15.00% | 25.00% |
| 59 | 7.00% | 10.00% | 7.20% | 7.20% | 10.00% | 25.00% | 15.00% | 25.00% |
| 60 | 7.00% | 15.00% | 9.00% | 9.00% | 25.00% | 25.00% | 15.00% | 25.00% |
| 61 | 15.00% | 30.00% | 15.00% | 10.80% | 15.00% | 25.00% | 15.00% | 25.00% |
| 62 | 25.00% | 40.00% | 20.00% | 20.00% | 30.00% | 25.00% | 15.00% | 25.00% |
| 63 | 15.00% | 40.00% | 20.00% | 20.00% | 20.00% | 30.00% | 15.00% | 25.00% |
| 64 | 26.00% | 40.00% | 20.00% | 20.00% | 20.00% | 30.00% | 15.00% | 25.00% |
| 65 | 26.00% | 40.00% | 25.00% | 25.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| 66 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 67 | 26.00% | 40.00% | 40.00% | 40.00% | | | | |
| 68 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 69 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 70 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 71 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 72 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 73 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 74 | 26.00% | 40.00% | 25.00% | 25.00% | | | | |
| 75 | 100.00% | 100.00% | 100.00% | 100.00% | | | | |

# APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

The following are the assumptions used in the actuarial valuation as of June 30, 2015. The actuarial assumptions were adopted by the Board based on recommendations included in an Experience Study performed by Cheiron covering the period from July 1, 2010 through June 30, 2013.

1. **Rate of Return**

   Assets are assumed to earn 7.50% net of investment expenses.

2. **Administrative Expenses**

   Administrative expenses are assumed to be $4.40 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 the assumed wage inflation of 3.50% each year.

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 2.75% per year for General Plans 5, Safety Plans 4, 6, and 8 (PEPRA), and APCD Plans 1 and 2; 2.00% per year for General Plans 7 and APCD Plan 8 (PEPRA), and 0% per year for General Plan 2.

   For General Plan 8 (PEPRA), benefits are assumed to increase at the rate of 2.00% per year if their employer had implemented General Plan 7 prior to January 1, 2013. Otherwise, benefits are assumed to increase at the rate of 2.75% per year.

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 after retirement.

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

   The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 7. Social Security Wage Base

General Plan 2 members have their benefits offset by an assumed Social Security Benefit. For projecting the Social Security Benefit, the annual Social Security Wage Base increase is assumed to be 3.00% per year. This assumption is also used for increasing the compensation limit that applies to PEPRA members.

### 8. Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 4.00%. As of June 30, 2008, the credited interest rate each six-month period is the semi-annual yield of the five-year Treasury note as of the last business day of the interest-crediting period.

### 9. Sick Leave Service Credit Upon Retirement

Upon retirement, members are entitled to turn their sick leave balances into service credit for retirement benefits. Members are limited to one year of service credit. A 1.34% load was applied to the expected years of service at retirement for sick leave service credit. This assumption was adopted effective June 30, 2010.

### 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 two years younger than their spouses.

| Percentage Married | |
|---|---|
| Gender | Percentage |
| Males | 75% |
| Females | 55% |

### 11. Vacation Cashout

Any cashouts of vacation during the final average salary period affecting the calculation of a retirement benefit are recognized at the time of retirement. There is no prerecognition of potential costs included in the valuation.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 12. Increases in Pay

Wage inflation component: 3.50%
Additional longevity and promotion component:

| Longevity and Promotion Increases | | |
|---|---|---|
| Service | General | Safety |
| 0 | 4.75% | 6.00% |
| 1 | 4.00% | 5.00% |
| 2 | 3.25% | 4.00% |
| 3 | 2.50% | 3.25% |
| 4 | 2.00% | 2.50% |
| 5 | 1.50% | 2.00% |
| 6 | 1.25% | 1.60% |
| 7 | 1.00% | 1.30% |
| 8 | 0.90% | 1.20% |
| 9 | 0.80% | 1.10% |
| 10 | 0.78% | 1.00% |
| 11 | 0.75% | 0.95% |
| 12 | 0.70% | 0.92% |
| 13 | 0.65% | 0.89% |
| 14 | 0.60% | 0.87% |
| 15 | 0.55% | 0.85% |
| 16 | 0.50% | 0.82% |
| 17 | 0.48% | 0.80% |
| 18 | 0.46% | 0.77% |
| 19 | 0.44% | 0.74% |
| 20 | 0.42% | 0.72% |
| 21 | 0.40% | 0.69% |
| 22 | 0.38% | 0.67% |
| 23 | 0.36% | 0.64% |
| 24 | 0.34% | 0.62% |
| 25 | 0.32% | 0.59% |
| 26 | 0.30% | 0.57% |
| 27 | 0.28% | 0.54% |
| 28 | 0.26% | 0.52% |
| 29 | 0.25% | 0.50% |
| 30+ | 0.25% | 0.50% |

** Increases are compound rather than additive.*

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 13. Rates of Termination

Sample rates of termination are show in the following table below. The 1.30% rate of termination continues for Safety PEPRA members with 20 or more years of service who are not eligible to retire.

| Rates of Termination | | |
|---|---|---|
| Service | General | Safety |
| 0 | 20.00% | 9.00% |
| 1 | 14.00% | 9.00% |
| 2 | 10.00% | 3.50% |
| 3 | 8.00% | 3.50% |
| 4 | 7.00% | 3.50% |
| 5 | 6.00% | 3.50% |
| 6 | 6.00% | 3.00% |
| 7 | 5.00% | 2.70% |
| 8 | 5.00% | 2.70% |
| 9 | 4.50% | 2.70% |
| 10 | 4.50% | 2.00% |
| 11 | 4.00% | 1.50% |
| 12 | 3.50% | 1.50% |
| 13 | 3.00% | 1.30% |
| 14 | 3.00% | 1.30% |
| 15 | 2.50% | 1.30% |
| 16 | 2.00% | 1.30% |
| 17 | 2.00% | 1.30% |
| 18 | 2.00% | 1.30% |
| 19 | 2.00% | 1.30% |
| 20 | 1.00% | 0.00% |
| 21 | 1.00% | |
| 22 | 1.00% | |
| 23 | 1.00% | |
| 24 | 1.00% | |
| 25 | 1.00% | |
| 26 | 1.00% | |
| 27 | 1.00% | |
| 28 | 1.00% | |
| 29 | 1.00% | |
| 30 | 0.00% | |

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

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 14. Withdrawal

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

| Rates of Withdrawal | | |
|---|---|---|
| Service | General | Safety |
| 0 | 100.00% | 100.00% |
| 1 | 100.00% | 100.00% |
| 2 | 100.00% | 100.00% |
| 3 | 100.00% | 100.00% |
| 4 | 100.00% | 100.00% |
| 5 | 30.00% | 30.00% |
| 6 | 30.00% | 30.00% |
| 7 | 30.00% | 30.00% |
| 8 | 30.00% | 30.00% |
| 9 | 30.00% | 30.00% |
| 10 | 20.00% | 15.00% |
| 11 | 20.00% | 15.00% |
| 12 | 20.00% | 15.00% |
| 13 | 20.00% | 15.00% |
| 14 | 20.00% | 15.00% |
| 15 | 15.00% | 15.00% |
| 16 | 15.00% | 15.00% |
| 17 | 15.00% | 15.00% |
| 18 | 15.00% | 15.00% |
| 19 | 15.00% | 15.00% |
| 20 | 15.00% | 0.00% |
| 21 | 15.00% | 0.00% |
| 22 | 15.00% | 0.00% |
| 23 | 15.00% | 0.00% |
| 24 | 15.00% | 0.00% |
| 25 | 0.00% | 0.00% |
| 26 | 0.00% | 0.00% |
| 27 | 0.00% | 0.00% |
| 28 | 0.00% | 0.00% |
| 29 | 0.00% | 0.00% |
| 30 | 0.00% | 0.00% |

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

Former members with contributions on deposit are assumed to receive a retirement benefit commencing at the following ages:

| | |
|---|---|
| General Plans 5, 7, and 8 (PEPRA) Members: | Age 58 |
| General Plan 2 Members: | Age 65 |
| Safety Plans 4 and 8 (PEPRA) Members: | Age 54 |
| Safety Plan 6 Members: | Age 50 |
| APCD Members: | Age 58 |

### 15. Reciprocal Transfers

50% of vested terminated General (except Plan 2) and Safety Members that leave their member contributions on deposit with the Plan are assumed to be reciprocal.

Reciprocal members are assumed to remain with the reciprocal agency until retirement, and receive annual salary increases of:

| | |
|---|---|
| General & APCD Members: | 3.75% |
| Safety Members: | 4.00% |

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 16. Rates of Disability

Disability rates of active participants are shown below.

| Rates of Disability | | | | |
|---|---|---|---|---|
| | General Years of Service | | Safety Years of Service | |
| Age | Less than 5 | 5 or More | Less than 5 | 5 or More |
| 29 or less | 0.004% | 0.010% | 0.045% | 0.050% |
| 30 | 0.004% | 0.010% | 0.072% | 0.080% |
| 31 | 0.004% | 0.010% | 0.072% | 0.080% |
| 32 | 0.004% | 0.010% | 0.072% | 0.080% |
| 33 | 0.004% | 0.010% | 0.072% | 0.080% |
| 34 | 0.004% | 0.010% | 0.072% | 0.080% |
| 35 | 0.004% | 0.010% | 0.090% | 0.100% |
| 36 | 0.004% | 0.010% | 0.090% | 0.100% |
| 37 | 0.004% | 0.010% | 0.090% | 0.100% |
| 38 | 0.004% | 0.010% | 0.090% | 0.100% |
| 39 | 0.004% | 0.010% | 0.090% | 0.100% |
| 40 | 0.004% | 0.010% | 0.117% | 0.130% |
| 41 | 0.008% | 0.020% | 0.117% | 0.130% |
| 42 | 0.012% | 0.030% | 0.117% | 0.130% |
| 43 | 0.016% | 0.040% | 0.117% | 0.130% |
| 44 | 0.020% | 0.050% | 0.117% | 0.130% |
| 45 | 0.024% | 0.060% | 0.135% | 0.150% |
| 46 | 0.028% | 0.070% | 0.162% | 0.180% |
| 47 | 0.032% | 0.080% | 0.180% | 0.200% |
| 48 | 0.036% | 0.090% | 0.225% | 0.250% |
| 49 | 0.040% | 0.100% | 0.225% | 0.250% |
| 50 | 0.048% | 0.120% | 0.252% | 0.280% |
| 51 | 0.052% | 0.130% | 0.270% | 0.300% |
| 52 | 0.056% | 0.140% | 0.630% | 0.700% |
| 53 | 0.060% | 0.150% | 0.630% | 0.700% |
| 54 | 0.064% | 0.160% | 0.630% | 0.700% |
| 55 | 0.068% | 0.170% | 0.630% | 0.700% |
| 56 | 0.072% | 0.180% | 0.630% | 0.700% |
| 57 | 0.076% | 0.190% | 0.630% | 0.700% |
| 58 | 0.080% | 0.200% | 0.630% | 0.700% |
| 59 | 0.084% | 0.210% | 0.630% | 0.700% |
| 60 | 0.088% | 0.220% | 0.630% | 0.700% |
| 61 | 0.092% | 0.230% | 0.630% | 0.700% |
| 62 | 0.092% | 0.230% | 0.630% | 0.700% |
| 63 | 0.092% | 0.230% | 0.630% | 0.700% |
| 64 | 0.092% | 0.230% | 0.630% | 0.700% |
| 65 | 0.092% | 0.230% | 0.000% | 0.000% |
| 66 | 0.092% | 0.230% | | |
| 67 | 0.092% | 0.230% | | |
| 68 | 0.092% | 0.230% | | |
| 69 | 0.092% | 0.230% | | |
| 70 | 0.092% | 0.230% | | |
| 71 | 0.092% | 0.230% | | |
| 72 | 0.092% | 0.230% | | |
| 73 | 0.092% | 0.230% | | |
| 74 | 0.092% | 0.230% | | |
| 75 | 0.000% | 0.000% | | |

40% of General disabilities and 90% of Safety disabilities where the member has five or more years of service are assumed to be service-related. All disabilities for those with less than five years or service are assumed to be service-related.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 17. Rates of Mortality for Healthy Lives

Mortality rates for actives, retirees, beneficiaries, terminated vested, and reciprocals are based on the sex distinct Retired Pensioner (RP) 2000 Combined Healthy Tables, published by the Society of Actuaries, with Generational improvement using Projection Scale BB.

### 18. Rates of Mortality for Retired Disabled Lives

Mortality rates for disabled retirees are based on the sex distinct Retired Pensioner (RP) 2000 Tables Combined Healthy Tables, published by the Society of Actuaries, with Generational improvement using Projection Scale BB, set forward five years for males and females.

### 19. Type of Mortality

For non-safety employees, all deaths are assumed to be non-service related.

## APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

### 20. Rates of Retirement

Rates of retirement are based on age according to the following table. The rates for Safety PEPRA members are the same as the Safety Plan 4 rates.

**Rates of Retirement**

| | General | | General - PEPRA | | Safety | |
|---|---|---|---|---|---|---|
| Age | Male | Female | Male | Female | Plan 4 | Plan 6 |
| < 34 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 35 | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 36 | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 37 | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 38 | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 39 | 0.00% | 0.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 40 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 41 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 42 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 43 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 44 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 45 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 1.00% |
| 46 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 2.00% |
| 47 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 5.00% |
| 48 | 3.00% | 4.00% | 0.00% | 0.00% | 1.00% | 5.00% |
| 49 | 3.00% | 4.00% | 0.00% | 0.00% | 3.00% | 17.00% |
| 50 | 3.00% | 4.00% | 0.00% | 0.00% | 4.00% | 23.00% |
| 51 | 4.00% | 4.00% | 0.00% | 0.00% | 4.00% | 14.00% |
| 52 | 4.00% | 4.00% | 2.40% | 1.80% | 4.00% | 14.00% |
| 53 | 4.00% | 4.00% | 2.40% | 1.80% | 5.00% | 14.00% |
| 54 | 4.00% | 6.00% | 2.40% | 5.40% | 22.00% | 28.00% |
| 55 | 4.00% | 7.00% | 2.40% | 5.40% | 33.00% | 31.00% |
| 56 | 6.00% | 8.00% | 3.60% | 5.40% | 23.00% | 20.00% |
| 57 | 6.00% | 9.00% | 3.60% | 5.40% | 23.00% | 20.00% |
| 58 | 6.00% | 9.00% | 3.60% | 5.40% | 23.00% | 20.00% |
| 59 | 12.00% | 12.00% | 7.20% | 7.20% | 23.00% | 20.00% |
| 60 | 15.00% | 13.00% | 9.00% | 9.00% | 23.00% | 20.00% |
| 61 | 25.00% | 23.00% | 15.00% | 10.80% | 23.00% | 20.00% |
| 62 | 25.00% | 23.00% | 20.00% | 20.00% | 23.00% | 20.00% |
| 63 | 25.00% | 23.00% | 20.00% | 20.00% | 23.00% | 20.00% |
| 64 | 25.00% | 23.00% | 20.00% | 20.00% | 23.00% | 20.00% |
| 65 | 25.00% | 23.00% | 25.00% | 25.00% | 100.00% | 100.00% |
| 66 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 67 | 25.00% | 23.00% | 40.00% | 40.00% | | |
| 68 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 69 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 70 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 71 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 72 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 73 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 74 | 25.00% | 23.00% | 25.00% | 25.00% | | |
| 75 | 100.00% | 100.00% | 100.00% | 100.00% | | |


*Classic Values, Innovative Advice*