

Tulare County Employees' Retirement Association

**Actuarial Experience Study
for July 1, 2017 through
June 30, 2020**

Produced by Cheiron

October 2020

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October 21, 2020

Board of Retirement
Tulare County Employees' Retirement Association
136 N. Akers St.
Visalia, CA 93291

Dear Members of the Board:

The purpose of this report is to provide the results of an Actuarial Experience Study of the Tulare County Employees' Retirement Association (TCERA) covering actuarial experience from July 1, 2017 through June 30, 2020.

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

Cheiron utilizes ProVal, an actuarial valuation software program leased from Winklevoss Technologies (WinTech), to calculate liabilities and projected benefit payments. We have reviewed the underlying workings of this model to the degree feasible and consistent with Actuarial Standard of Practice No. 56 and believe them to be appropriate for the purposes of this experience study report.

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

This report was prepared for the Retirement Board of TCERA for the purposes described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

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

Sincerely,
Cheiron

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

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

A handwritten signature in blue ink, reading "Steven M. Hastings".

Steven M. Hastings, FSA, EA, FCA, MAAA
Consulting Actuary

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

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 TCERA, 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 TCERA's membership or assets that would warrant such frequent or significant changes.

This report does not reflect any changes to long-term assumptions as a result of COVID-19, other than information that is already known as of the measurement date (June 30, 2020), such as current market conditions and actual changes in the covered population. Although COVID-19 is likely to have an impact on both economic and demographic experience, at least over the short term, the long-term effect of the pandemic is uncertain.

SUMMARY OF ECONOMIC ASSUMPTION ANALYSIS

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

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 base wage and payroll increases of 3.00%, and a post-retirement COLA average growth rate of 2.60% for Tier 1 members and 2.00% for all other members.

The nominal discount rate assumption of 7.00% is far greater than the geometric average long-term (10-year) return of 5.58% for the current target portfolio based on the capital market assumptions provided by Verus, the Plan's investment consultant. However, Verus' expected real return after accounting for investment and administrative expenses is approximately 3.55%, which is closer to the 4.25% real return assumption adopted by the Board. In addition, the Horizon Actuarial Services 2020 survey of investment consulting firms shows a material difference in longer-term expectations, with an increase of 0.84% between the 10-year and 20-year average expected real returns. Considering all the evidence, we think the real return assumption of 4.25% adopted by the Board is reasonable.

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

SECTION I – EXECUTIVE SUMMARY

SUMMARY OF DEMOGRAPHIC ASSUMPTION ANALYSIS

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

- **Retirement rates** – Adjust Safety rates to reflect past experience, with a small increase in rates for members with 20 or more years of service. Due to lack of experience – and similarity in the benefit formulas for Safety members – we continue to use the same rates for PEPRA and non-PEPRA tiers. No changes to General rates.
- **Termination rates** – Adjust rates to reflect past experience. Reduce General rates for members with 10 or more years of service, and reduce rates for Safety members with fewer than three years of service. Increase assumed rate of deferred vested termination vs. withdrawals for General female members, particularly at higher service. Small reduction in reciprocal transfer rates for General members. Increase deferred retirement commencement age for Safety members.
- **Disability rates** – Replace duty-related disability rates for female General members with the male rates. No change to non-duty related disability rates or Safety duty-related rates.
- **Mortality rates** – Reduce rates slightly for healthy male General retirees, and update mortality improvement scale for all members.
- **Merit salary increases** – Reduce General salary increases at higher service levels and Safety salary increases at lower service lowers; increase Safety salary increases at higher service levels. Update reciprocal transfer salary increases to reflect wage inflation plus ultimate merit salary increases.
- **Leave conversion** – Add a load of 1% to benefit service for General members and 2% for Safety members for expected conversions of unused leave upon a service retirement.
- **Other assumptions** – Lower the percentage of members who are assumed to be married.

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

COST OF ECONOMIC AND DEMOGRAPHIC ASSUMPTION CHANGES

The economic assumptions adopted by the Board resulted in an estimated increase of 2.5% to the total contribution rate (employer and employee). The demographic assumptions resulted in a lower overall contribution requirement (reducing the total rate by 0.4% of pay), with the changes to the merit salary scales, termination rates and the leave conversion load having the largest absolute impact.

The table on the following page summarizes the estimated cost impact – for the General, Safety, and combined membership – of the recommended changes to economic and demographic assumptions contained in this report. The overall impact on the employer contribution rates is being phased in over a three-year period, based on action taken by the Board at their September 23, 2020 meeting. The net impact on the 2020 valuation will be found in the June 30, 2020 valuation report.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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SECTION I – EXECUTIVE SUMMARY

Table I-1

Estimated Impact on Contribution Rates from Assumption Changes (based on June 30, 2020 valuation results)									
Description	Change in Contribution Rate (EE + ER)								
	Normal Cost Rate			UAL Rate			Total Contribution Rate		
	General	Safety	Total	General	Safety	Total	General	Safety	Total
<u>Recommended Demographic Assumptions</u>									
Mortality Rates	0.0%	-0.1%	-0.1%	-0.1%	-0.5%	-0.2%	-0.2%	-0.6%	-0.3%
Retirement Rates	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Termination Rates	0.4%	0.0%	0.3%	0.2%	0.0%	0.1%	0.6%	0.0%	0.5%
Disability Rates	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%	0.2%
Merit Salary Scale	-0.6%	-0.1%	-0.5%	-0.8%	0.5%	-0.5%	-1.4%	0.4%	-1.0%
Family Composition	-0.1%	-0.2%	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	-0.3%	-0.2%
Changes to Terminated/Deferred Members	0.1%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	-0.2%	0.0%
Service Load	<u>0.1%</u>	<u>0.2%</u>	<u>0.1%</u>	<u>0.2%</u>	<u>0.4%</u>	<u>0.2%</u>	<u>0.3%</u>	<u>0.6%</u>	<u>0.3%</u>
Total (Proposed Demographic Assumptions)	0.0%	-0.2%	0.0%	-0.6%	0.2%	-0.4%	-0.5%	0.0%	-0.4%
<u>New Economic Assumptions</u>									
7.00% Discount, 2.6% Tier 1 COLA, 3.00% Wage Growth	1.0%	1.4%	1.1%	1.3%	1.8%	1.5%	2.3%	3.2%	2.5%
Final Impact of Assumption Changes (EE + ER)	1.0%	1.2%	1.1%	0.8%	2.0%	1.0%	1.8%	3.2%	2.1%
Change to ER Rate due to Employee Contribution Rates Update	-0.7%	-1.1%	-0.8%	0.0%	0.0%	0.0%	-0.7%	-1.1%	-0.8%
Total Change to ER Rate	0.4%	0.2%	0.3%	0.8%	2.0%	1.0%	1.1%	2.1%	1.3%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

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

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

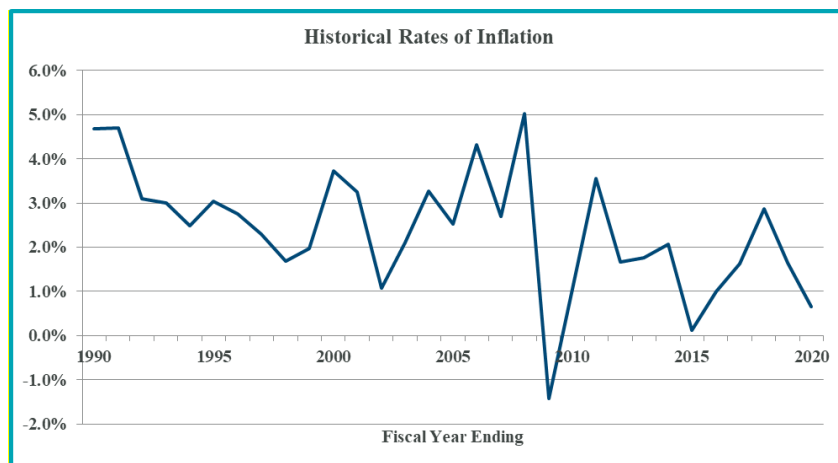
PRICE INFLATION

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

Historical Data

Chart II-1 below shows inflation for the U.S. by Plan year (ending June 30) since 1990, as measured by the CPI-U.

Chart II-1



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

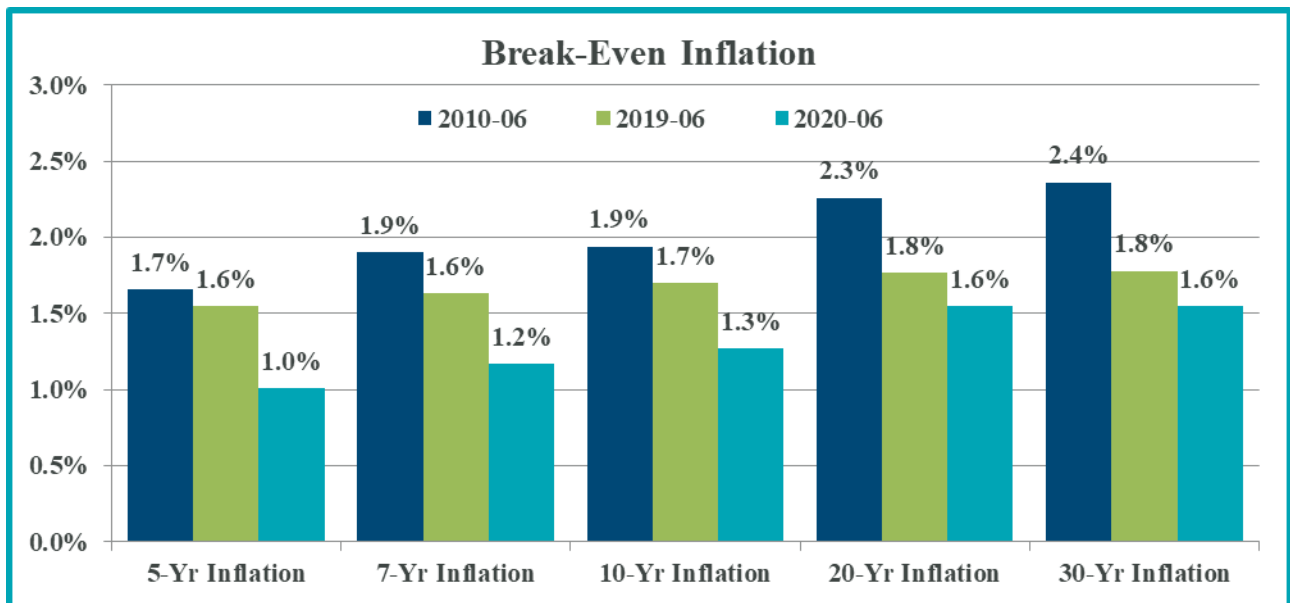
**SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION**

Over the 50 years ending June 2020, the geometric average inflation rate for the U.S. has been about 3.9%, but this average is heavily influenced by the high inflation rates in the 1970s and early 1980s. Over the last 30 years, the geometric average inflation rate has been 2.3%, 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. Chart II-2 shows the yields on both types of bonds and the break-even inflation rate as of June 2020, as well as the periods one and 10 years earlier. 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.

Chart II-2



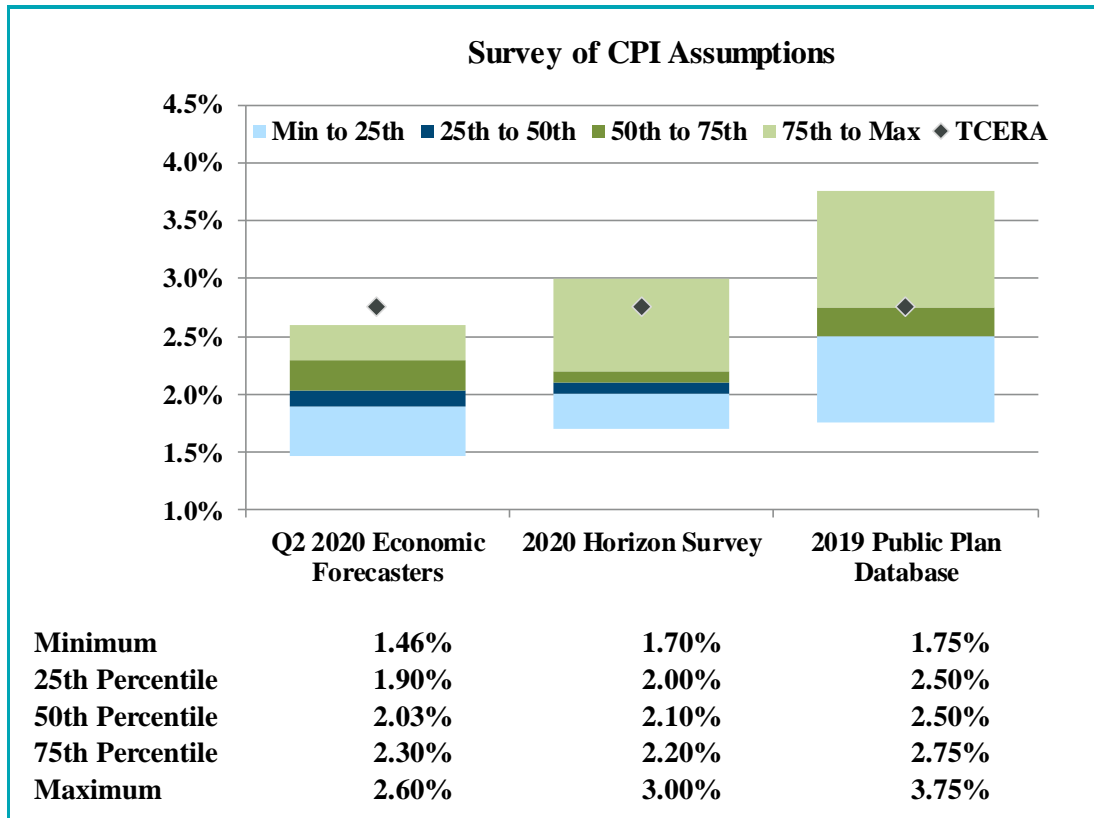
Data Source Federal Reserve, Constant Maturity Yields, Monthly Series

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION II – ECONOMIC ASSUMPTIONS
PRICE INFLATION**

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

Chart II-3



Finally, Verus, the Board's investment consultant, uses a 10-year inflation assumption of around 1.83%, which is 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 2.00% and 2.75%. Although the comparison between the conventional Treasury bond and TIPS yields indicates a breakeven inflation rate below 2.00%, we note that this spread (as well as other market indicators of inflation) can be quite volatile.

Therefore, we believe the Board's recent action to reduce the inflation assumption from 3.00% to 2.75% is reasonable and appropriate. If, at the time of the next review of economic assumptions, the markets and forecasters continue to indicate lower expectations of future inflation, a reduction in the assumption should be considered.

**SECTION II – ECONOMIC ASSUMPTIONS
WAGE INFLATION**

WAGE/PAYROLL 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.

From 2002 through 2018, national wage inflation averaged approximately 2.69% compared to annual price inflation of 2.10%, making wage increases more than 0.5% above inflation. However, over the same time period the increase in the median real wage was only 0.3% per year, as much of the growth in wages was clustered at the top end of the wage scale. Wage inflation dropped significantly in 2008 and 2009, and there were smaller declines in national average wage growth in 2013 and 2016.

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.

However, governmental entities remain under financial stress (even more so now under the COVID-19 crisis) and other areas of employee compensation – most notably health care costs and pension contributions – have continued to increase faster than the CPI.

We think it is reasonable that the Board elected to increase the real wage growth assumption from 0.00% to 0.25% as part of the recent changes in the economic assumptions (retaining a 3.00% total wage growth assumption, in conjunction with the reduction in the inflation assumption by 0.25%). This change brings the real wage growth assumption into closer alignment with the long-term assumption used by many other plans and the Social Security Administration in their projections.

The 3.00% wage inflation assumption adopted by the Board 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.

**SECTION II – ECONOMIC ASSUMPTIONS
COLA GROWTH**

COLA GROWTH

Tier 1 members of TCERA are eligible to receive automatic Cost-of-Living Adjustments (COLAs), based on the growth in the Riverside-San Bernardino-Ontario Consumer Price Index (CPI) rounded to 0.5% and with a 3% cap on the annual COLA increase. Any increase in the CPI above the 3% maximum increase can be banked for future years in which the change in the CPI is below 3%. The COLAs for Tiers 2-4 are determined in the same manner, except the cap on the annual increase is 2%.

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 the following inputs: a 25% autocorrelation factor with 1.4% annual inflation volatility, and a starting inflation level of 2.00% to reflect the low level of current inflation.

Based on the results from these simulations 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 2.70% to 2.60% for Tier 1 members. For members in Tiers 2-4, we recommend continuing to assume that the COLA growth will be equal to the 2% cap.

**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

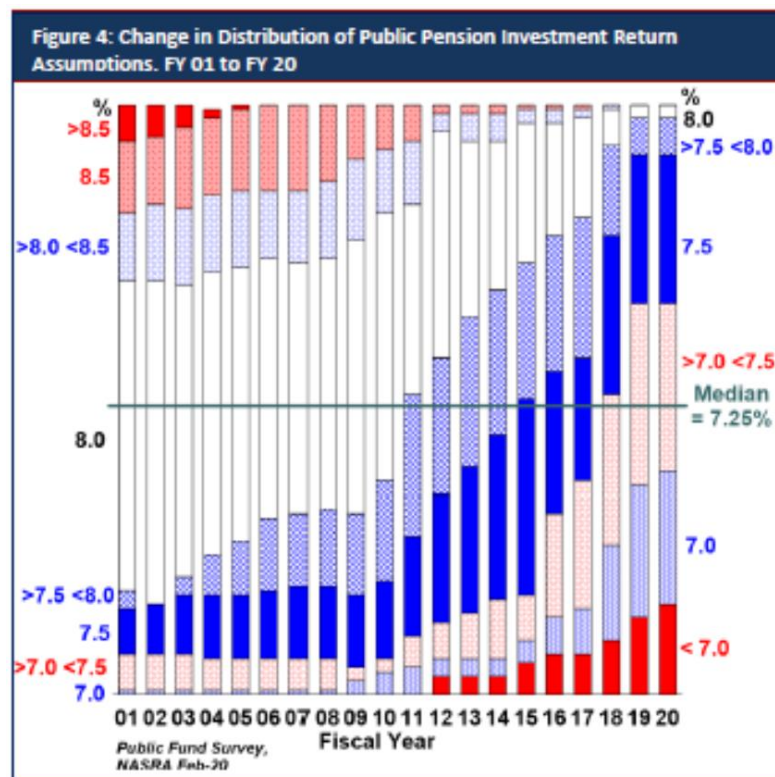
DISCOUNT RATE

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

Other Large Public Retirement Plans

Based on the Public Fund Survey, developed by the National Association of State Retirement Administrators (NASRA) covering most of the largest public retirement systems in the country, there has been a general movement over at least the last decade to reduce the discount rate used in actuarial valuations. Chart II-4 below shows the change in the distribution of assumptions since 2001. The median assumption is now 7.25% and the number of plans using a discount rate of 7.0% or lower has increased significantly.

Chart II-4

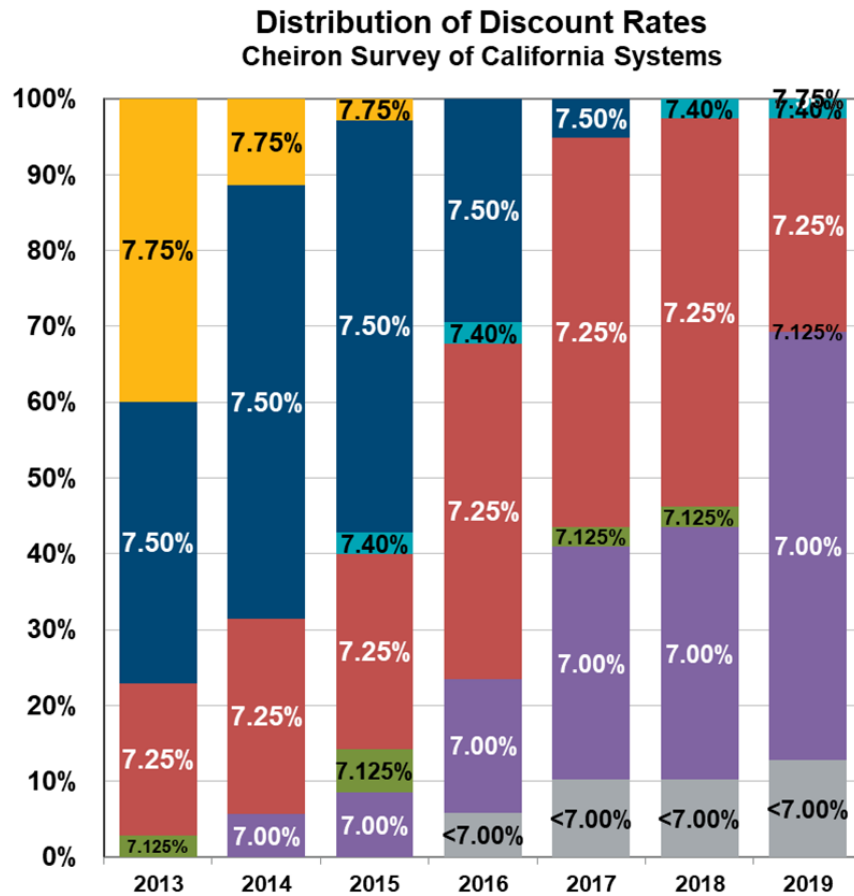


**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

In our survey of California retirement systems, only 30% were still using a discount rate of 7.25% or greater as of 2019. Chart II-5 below shows the change in discount rate assumptions for California systems from 2013 to 2019.

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.

Table II-1 on the following page shows the target allocation based on the Board's current policy along with the capital market assumptions provided by the Plan's investment consultant, Verus, as of July, 2020. Based on those assumptions, we calculated an expected geometric return of 5.58%, which is close to the geometric return expectation provided by Verus for this portfolio

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**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

(5.7%). This correlates to a 3.75% real expected return based on the Verus inflation assumption of 1.83%.

Table II-1

Verus 10-year Assumptions (as of July, 2020)				
Asset Category	Target Allocation	Arithmetic Return	Geometric Return	Standard Deviation
US Large Cap	19.0%	6.5%	5.3%	15.4%
US Small Cap	6.0%	7.2%	5.1%	21.1%
International Stock	12.0%	7.6%	6.2%	17.5%
Emerging Market Equity	3.0%	8.8%	5.9%	25.6%
Global Equity	3.0%	7.7%	6.4%	16.8%
Private Equity	5.0%	11.3%	8.5%	25.3%
Core Plus FI (US Credit)	17.0%	2.6%	2.3%	8.3%
Global Credit	5.0%	1.4%	1.2%	6.2%
EMD (Hard)	2.5%	6.3%	5.6%	12.4%
EMD (Local)	2.5%	5.0%	4.4%	12.0%
Private Credit	5.0%	5.7%	5.2%	10.0%
Core RE	10.0%	7.0%	6.0%	12.4%
Value-Add RE	5.0%	10.0%	8.6%	17.7%
RE Debt	5.0%	4.3%	4.0%	7.6%
Total	100.0%	6.13%	5.58%	10.82%
Real Return		4.30%	3.75%	

We also reran the results from 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-2 on the next page.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

Table II-2

TCERA Portfolio Return Expectations (reflects 20bp adjustment for administrative and investment expenses)				
Consultant	Nominal	Inflation	Real	Standard Deviation
Verus (10-year)	5.38%	1.83%	3.55%	10.82%
Horizon (Survey, 10-year)	6.10%	1.98%	4.12%	11.40%
Horizon (Survey, 20-year)	<u>6.94%</u>	<u>2.17%</u>	<u>4.77%</u>	<u>11.40%</u>
Average	6.14%	1.99%	4.15%	11.21%
Current Assumption	7.25%	3.00%	4.25%	

We note that the returns in Table II-2 above were reduced by 0.15% to reflect administrative expenses (based on recent experience) and another 0.05% to reflect fees on passively-managed portfolios.

At the time of the last experience study, the Board elected to continue using an expected return that is net of administrative expenses. An alternative method considered was to reflect administrative expenses explicitly in the cost calculation, by adding a third component to the Plan's actuarial cost, in addition to the UAL payment and normal cost. This approach has been used by other plans more commonly, since the implementation of GASB 67/68, which requires the use of an expected return which is gross of administrative expenses. But either methodology is acceptable for funding valuation purposes, so we believe it is reasonable for TCERA to continue this practice.

With respect to investment 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 other investment-related expenses, including those of the investment advisor and custodian.

Based on these capital market assumptions, as adjusted for administrative and investment expenses as discussed above, we also calculated the potential distribution of returns over 10-year and 20-year periods (as applicable), as shown in Table II-3.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION II – ECONOMIC ASSUMPTIONS
DISCOUNT RATE**

Table II-3

Likelihood of Achieving Average Returns (reflects 20bp adjustment for administrative and investment expenses)						
	Nominal			Real		
	6.75%	7.00%	7.25%	3.75%	4.00%	4.25%
Verus (10-yr)	34%	32%	29%	48%	45%	42%
Horizon (10-yr)	43%	40%	37%	54%	51%	48%
Horizon (20-yr)	53%	49%	45%	66%	62%	58%
Average	43%	40%	37%	56%	53%	49%

The prior nominal (7.25%) assumption was well above the average across the various capital market assumptions, while the average real return was within 0.10% of the overall average. All of the information above suggests that the Board's decision to reduce the nominal return and inflation assumption by 0.25%, while leaving the real return expectation at 4.25%, was reasonable and appropriate.

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, in particular to consider whether additional reductions in the inflation and nominal return assumptions are warranted.

Finally, we note that no adjustments have been made to the expected rate of return or funding discount rate to account for the impact of the Supplemental Retiree Benefit Reserve (SRBR). The expected rate of return developed in this experience study report reflects the expected return on all assets of the Plan, regardless of whether used to fund the basic benefits of the Plan or supplemental benefits payable through the SRBR.

The actuarial valuation report includes an estimate of the potential liability associated with future potential transfers to the SRBR that could result from future investment gains. Our most recent estimate of the potential impact of these transfers on the net returns available to fund the non-SRBR benefits of the Plan was a reduction of approximately 0.2%. However, this estimate can vary significantly from year to year, based on fluctuations in the deferred losses reflected in the current Actuarial Value of Assets.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**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 TCERA, with some adjustments where future experience is expected to differ from historical experience and with deference to standard tables where TCERA 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 TCERA'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. A longitudinal approach was used to analyze the merit increases for this study.

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

Charts III-1 and III-2 on the following pages analyze the pay for General and Safety members, respectively, over the past three years. We also reviewed the experience over a longer period (six years), and found the experience to be similar and supportive of our recommended assumptions. Our charts show the current assumption (red line) compared to the actual experience (blue line) and the recommended assumption (green line). We backed out the wage growth in order to isolate the merit, promotion, and longevity component.

It is important to note that the data may have been skewed by negative increases in some years. Therefore, as with any assumption change, there is movement in the direction of data, but not necessarily the entire way.

We recommend decreasing the merit assumption for General members at 15 to 24 years of service, reducing the Safety rates at most lower service points, and increasing the ultimate Safety rate (for those with 12 or more years of service).

TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020

SECTION III – DEMOGRAPHIC ASSUMPTIONS
MERIT SALARY INCREASES

Chart III-1: General

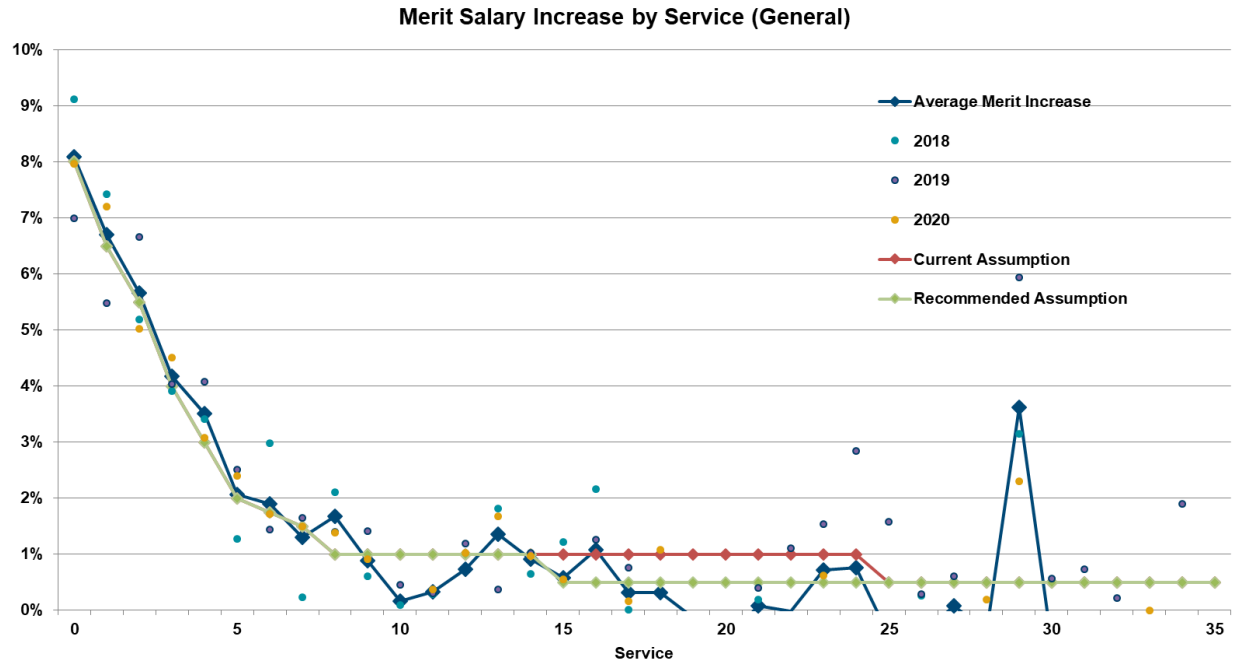
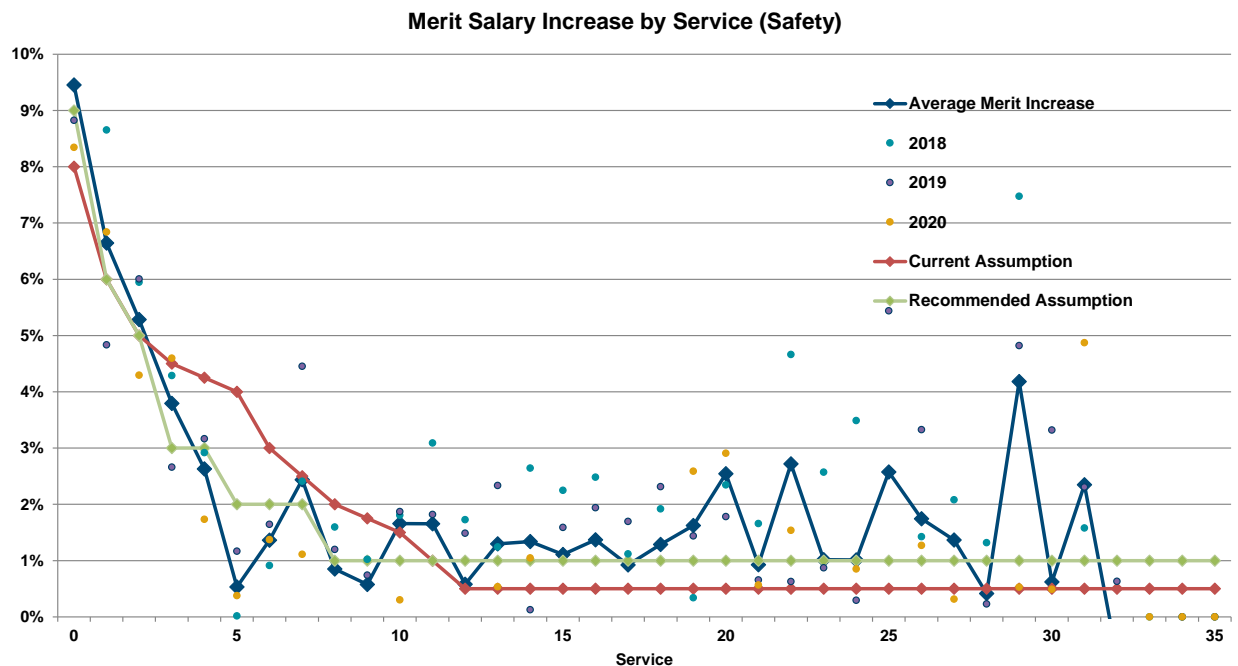


Chart III-2: Safety



SECTION III – DEMOGRAPHIC ASSUMPTIONS

ANALYSIS OF OTHER DEMOGRAPHIC ASSUMPTIONS

For all of the remaining demographic assumptions, we determined the ratio of the actual number of decrements for each membership group compared to the expected number of decrements (A/E ratio or actual-to-expected ratio). If the assumption has matched perfectly to historical experience during the study period, 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 recommend 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 TCERA's experience to that of a standard table and adjust the tables to bring the recommended assumption closer to an A/E ratio of 100%.

Finally, since the amount of data that is available over a three-year period to analyze the decrements is somewhat limited, we have added data from the prior study (from 2014-2017) to add more credibility to these calculations.

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

RETIREMENT RATES

The current retirement rates vary by group, age, and service and are applied to all members who are eligible to retire.

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

We continue to 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. We did not find that retirement rates are materially different between males and females for General members, so we continue to recommend combined male and female rates. We recommend no changes to rates for General members.

We continue to recommend separate assumptions by age for the following two service groups for Safety members: 1) members with less than 20 years of service and 2) members with 20 or more years of service. For members with less than 20 years of service, we recommend increasing retirement rates for ages 55 to 59 and 65 to 69 because actual rates are higher than expected. We recommend no other changes to rates for Safety members.

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

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

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

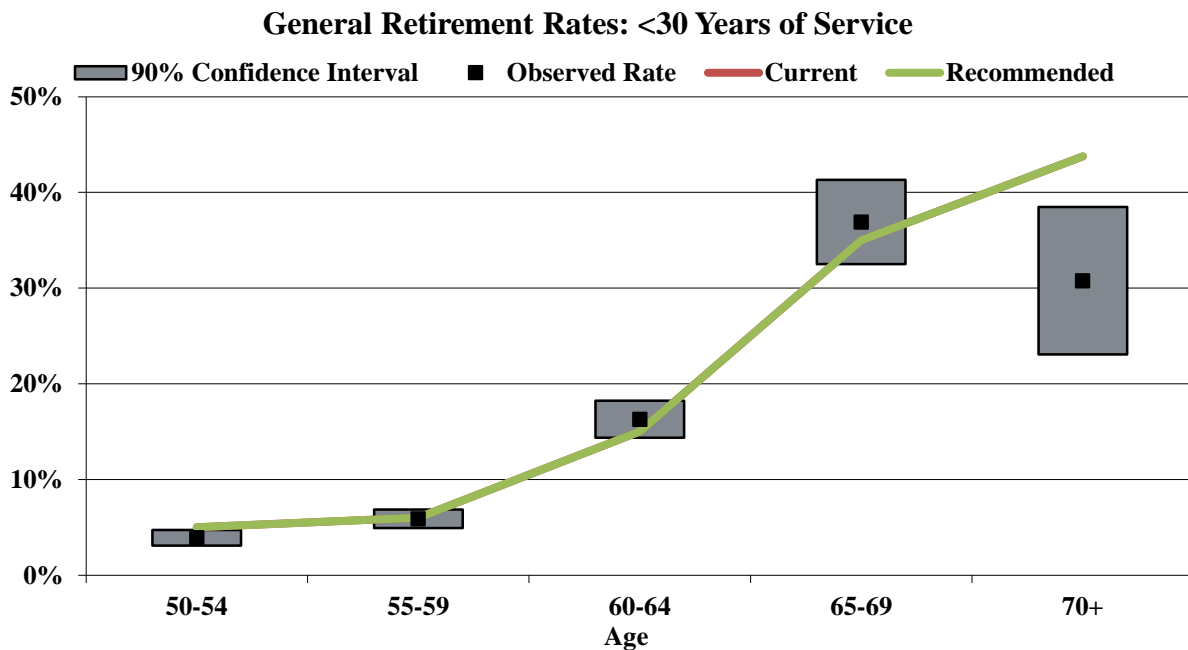
Table III-R1 shows the calculation of actual-to-expected ratios for General members with less than 30 years of service. Chart III-R1 shows the information graphically along with the 90% confidence interval.

The data shows slightly lower actual retirement rates than expected under the current assumption. However, due to having insufficient credible experience and the actual rates being close to the current rates, we do not recommend any changes to the current assumption.

Table III-R1

General Retirement Rates: <30 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
50-54	1,460	57	73	73	3.9%	5.0%	5.0%	78%	78%
55-59	1,529	90	92	92	5.9%	6.0%	6.0%	98%	98%
60-64	982	160	147	147	16.3%	15.0%	15.0%	109%	109%
65-69	317	117	111	111	36.9%	35.0%	35.0%	105%	105%
70+	104	32	46	46	30.8%	43.8%	43.8%	70%	70%
Total	4,392	456	468	468	10.4%	10.7%	10.7%	97%	97%
R-squared			0.834	0.834					

Chart III-R1



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

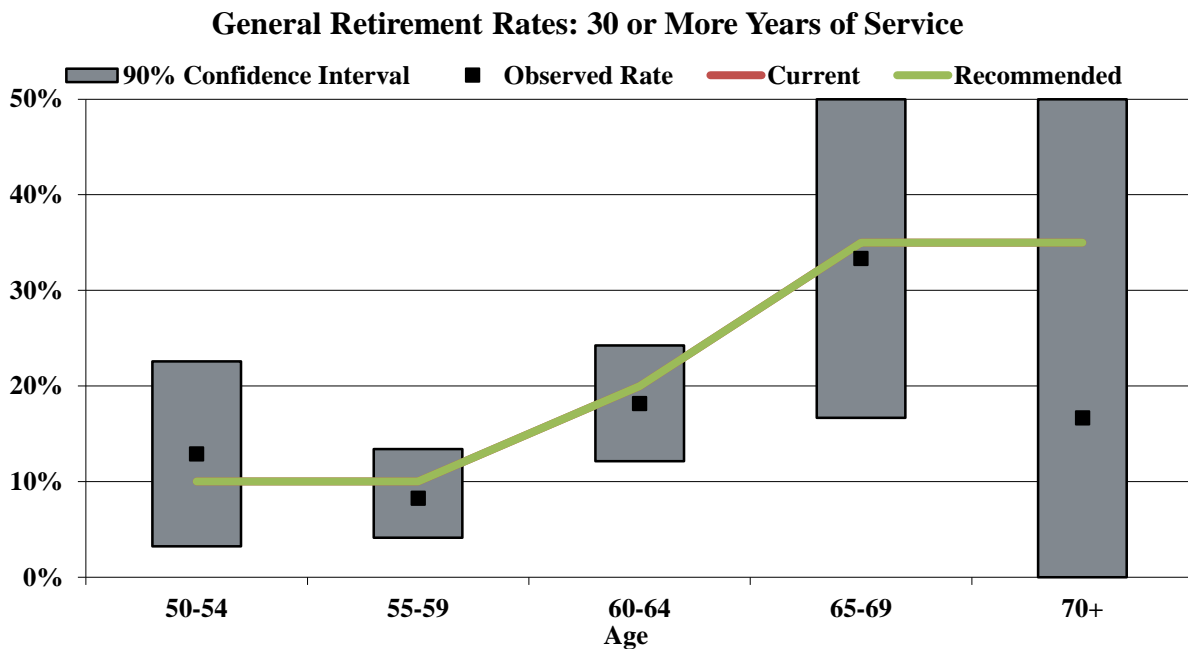
Table III-R2 shows the calculation of actual-to-expected ratios for General members with 30 or more years of service. Chart III-R2 shows the information graphically along with the 90% confidence interval.

The data shows slightly lower actual retirement rates than expected under the current assumption. However, due to having insufficient credible experience and the actual rates being close to the current rates, we do not recommend any changes to the current assumption.

Table III-R2

General Retirement Rates: 30 or More Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
50-54	31	4	3	3	12.9%	10.0%	10.0%	129%	129%
55-59	97	8	10	10	8.2%	10.0%	10.0%	82%	82%
60-64	99	18	20	20	18.2%	20.0%	20.0%	91%	91%
65-69	18	6	6	6	33.3%	35.0%	35.0%	95%	95%
70+	6	1	2	2	16.7%	35.0%	35.0%	48%	48%
Total	251	37	41	41	14.7%	16.3%	16.3%	90%	90%
R-squared			0.354	0.354					

Chart III-R2



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

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

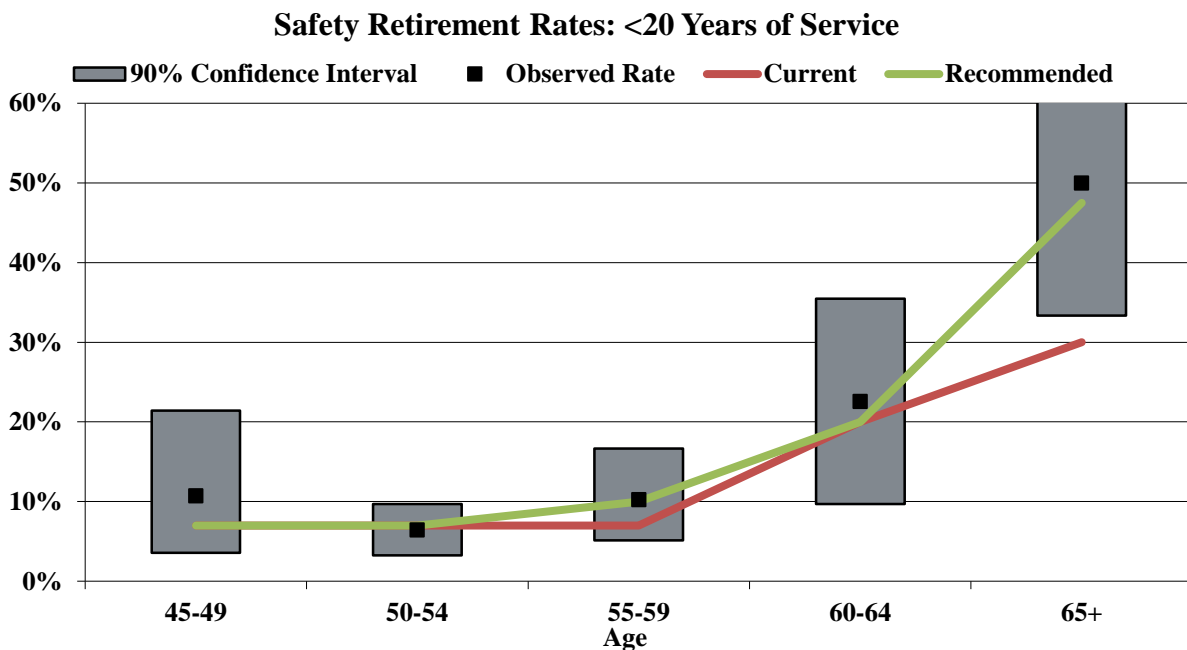
The data shows higher actual retirement rates than expected under the current assumption. The recommended assumption increases the aggregate assumed rate of retirement and decreases the aggregate A/E ratio from 126% to 105%. The r-squared increases from 0.255 to 0.552.

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

Table III-R3

Safety Retirement Rates: <20 Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
45-49	28	3	2	2	10.7%	7.0%	7.0%	153%	153%
50-54	155	10	11	11	6.5%	7.0%	7.0%	92%	92%
55-59	78	8	5	8	10.3%	7.0%	10.0%	147%	103%
60-64	31	7	6	6	22.6%	20.0%	20.0%	113%	113%
65+	24	12	7	11	50.0%	30.0%	47.5%	167%	105%
Total	316	40	32	38	12.7%	10.0%	12.1%	126%	105%
R-squared			0.255	0.552					

Chart III-R3



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
RETIREMENT RATES**

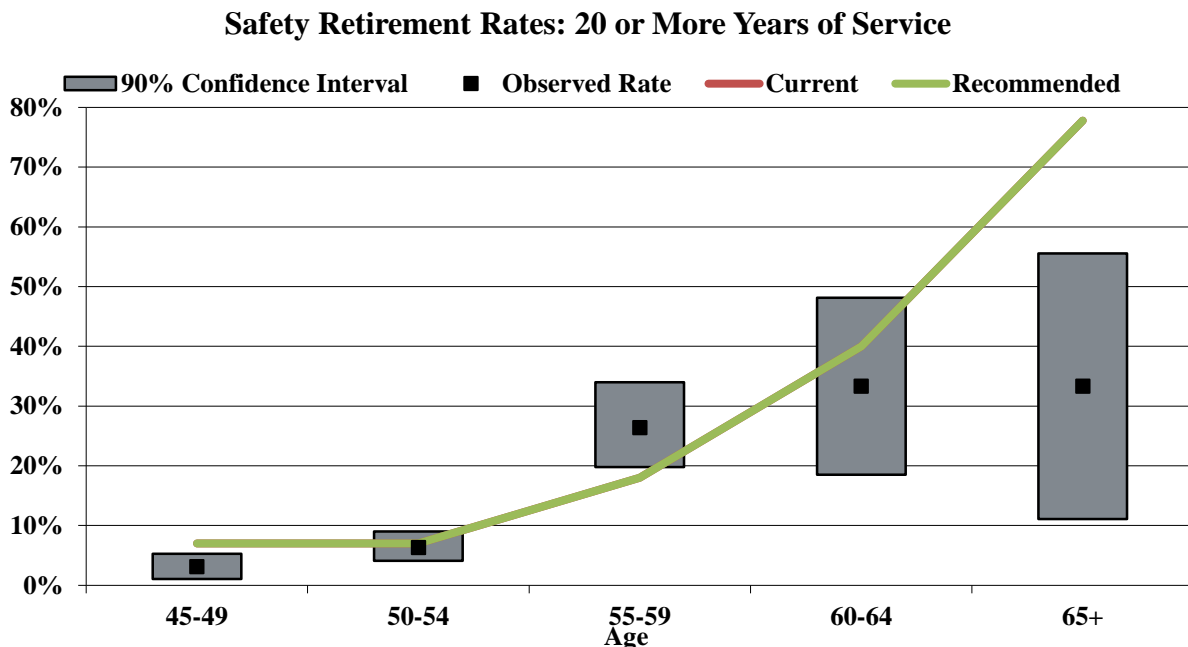
Table III-R4 shows the calculation of actual-to-expected for Safety members with 20 or more years of service. Chart III-R4 shows the information graphically along with the 90% confidence interval.

The data shows slightly lower actual retirement rates than expected under the current assumption. However, due to having insufficient credible experience and the actual rates being close to the current rates, we do not recommend any changes to the current assumption.

Table III-R4

Safety Retirement Rates: 20 or More Years of Service									
Age	Exposures	Retirements			Retirement Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
45-49	190	6	13	13	3.2%	7.0%	7.0%	45%	45%
50-54	267	17	19	19	6.4%	7.0%	7.0%	91%	91%
55-59	106	28	19	19	26.4%	18.0%	18.0%	147%	147%
60-64	27	9	11	11	33.3%	40.0%	40.0%	83%	83%
65+	9	3	7	7	33.3%	77.8%	77.8%	43%	43%
Total	599	63	69	69	10.5%	11.5%	11.5%	91%	91%
R-squared			0.477	0.477					

Chart III-R4



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**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 age and service for both General and Safety members, with unisex assumptions applied to both groups. Basing termination rates on both age and years of service 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.

We recommend separate assumptions by age for the following four service groups for General members: 1) members with less than three years of service, 2) members with 3-4 years of service, and 3) members with 5-9 years of service, and 4) members with 10 or more years of service. We did not find that termination rates are materially different between males and females for General members, so we continue to recommend using unisex tables.

We recommend separate assumptions by age for the following three service groups for Safety members: 1) members with less than three years of service, 2) members with 3-4 years of service, and 3) and members with five or more years of service.

To make the best use of the available member data, we study all terminations together – vested terminations, terminating members who withdraw their contributions, and members who transfer to a reciprocal pension plan – to determine an overall termination rate. We then analyze the percentages of terminating members who withdraw their contributions, transfer, or are eligible for a vested benefit.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Table III-T1 shows the calculation of actual-to-expected ratios for General members with less than three years of service. Chart III-T1 shows the information graphically along with the 90% confidence interval.

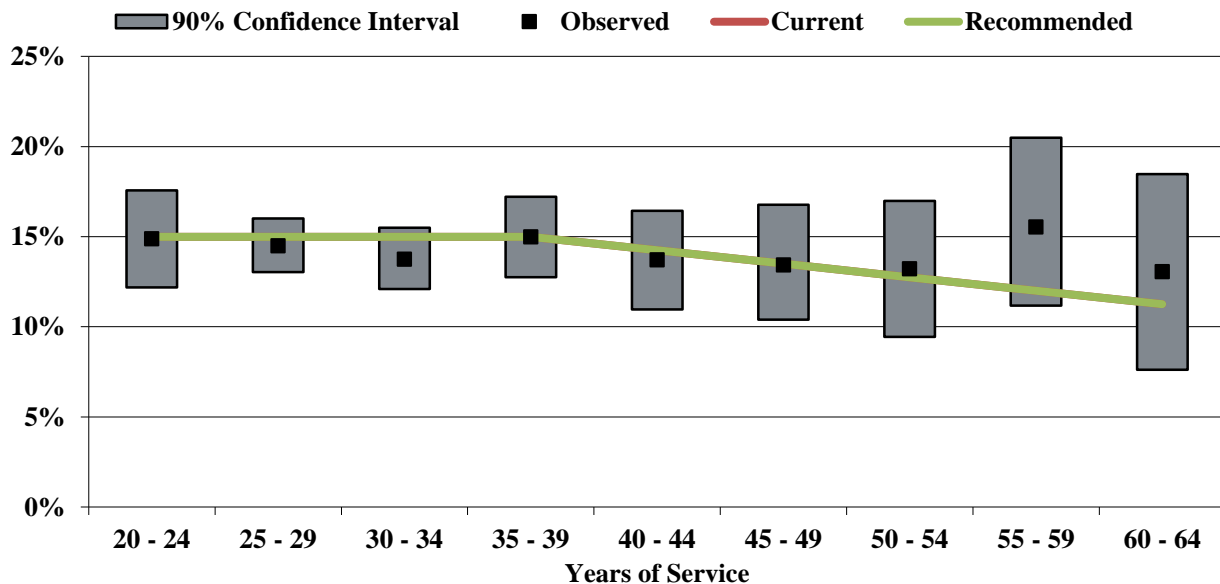
The data shows that the actual termination rates are slightly lower in general and in aggregate, but the r-squared is 0.952 and the A/E ratio is 98%; therefore, we are comfortable recommending no change to the assumption.

Table III-T1

General Termination Rates: Less than 3 Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	484	72	73	73	14.88%	15.00%	15.00%	99%	99%
25 - 29	1,511	219	227	227	14.49%	15.00%	15.00%	97%	97%
30 - 34	1,091	150	164	164	13.75%	15.00%	15.00%	92%	92%
35 - 39	674	101	101	101	14.99%	15.00%	15.00%	100%	100%
40 - 44	438	60	62	62	13.70%	14.25%	14.25%	96%	96%
45 - 49	298	40	40	40	13.42%	13.50%	13.50%	99%	99%
50 - 54	212	28	27	27	13.21%	12.75%	12.75%	104%	104%
55 - 59	161	25	19	19	15.53%	12.00%	12.00%	129%	129%
60 - 64	92	12	10	10	13.04%	11.25%	11.25%	116%	116%
Total	4,961	707	723	723	14.25%	14.58%	14.58%	98%	98%
R-squared			0.952	0.952					

Chart III-T1

General Termination Rates: Less than 3 Years of Service



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

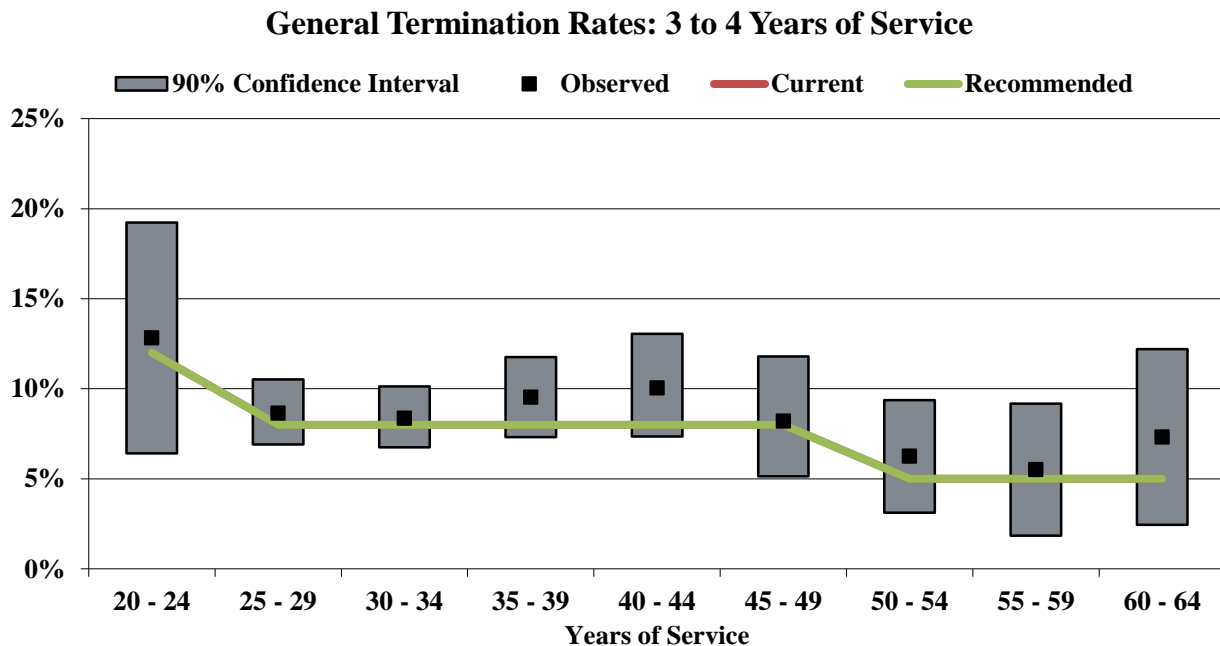
Table III-T2 shows the calculation of actual-to-expected ratios for General members with three to four years of service. Chart III-T2 shows the information graphically along with the 90% confidence interval.

The data shows that the actual termination rates are slightly higher in general and in aggregate, but the r-squared is 0.863 and the A/E ratio is 112%; therefore, we are comfortable recommending no change to the assumption.

Table III-T2

General Termination Rates: 3 to 4 Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	78	10	9	9	12.82%	12.00%	12.00%	107%	107%
25 - 29	637	55	51	51	8.63%	8.00%	8.00%	108%	108%
30 - 34	741	62	59	59	8.37%	8.00%	8.00%	105%	105%
35 - 39	451	43	36	36	9.53%	8.00%	8.00%	119%	119%
40 - 44	299	30	24	24	10.03%	8.00%	8.00%	125%	125%
45 - 49	195	16	16	16	8.21%	8.00%	8.00%	103%	103%
50 - 54	160	10	8	8	6.25%	5.00%	5.00%	125%	125%
55 - 59	109	6	5	5	5.50%	5.00%	5.00%	110%	110%
60 - 64	82	6	4	4	7.32%	5.00%	5.00%	146%	146%
Total	2,752	238	213	213	8.65%	7.73%	7.73%	112%	112%
R-squared			0.863	0.863					

Chart III-T2



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

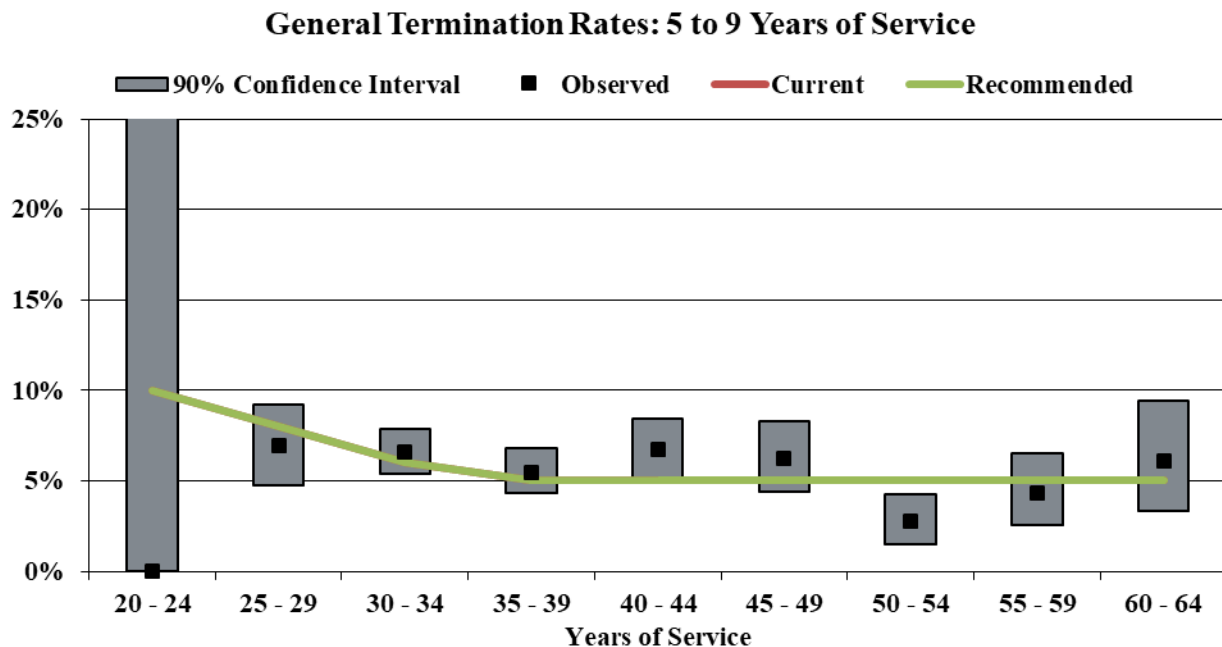
Table III-T3 shows the calculation of actual-to-expected ratios for General members with five to nine years of service. Chart III-T3 shows the information graphically along with the 90% confidence interval.

The data shows that the actual termination rates are slightly higher in general and in aggregate, but the r-squared is 0.789 and the A/E ratio is 106%; therefore, we recommend continuing to use the same rates. Previously, these rates applied to all General members with more than five years of service, but the new recommended assumption only applies to General members with five to nine years of service.

Table III-T3

General Termination Rates: 5 to 9 Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	5	0	1	1	0.00%	10.00%	10.00%	0%	0%
25 - 29	359	25	29	29	6.96%	8.00%	8.00%	87%	87%
30 - 34	1,080	71	65	65	6.57%	6.00%	6.00%	110%	110%
35 - 39	930	51	47	47	5.48%	5.00%	5.00%	110%	110%
40 - 44	627	42	31	31	6.70%	5.00%	5.00%	134%	134%
45 - 49	433	27	22	22	6.24%	5.00%	5.00%	125%	125%
50 - 54	399	11	20	20	2.76%	5.00%	5.00%	55%	55%
55 - 59	277	12	14	14	4.33%	5.00%	5.00%	87%	87%
60 - 64	180	11	9	9	6.11%	5.00%	5.00%	122%	122%
Total	4,290	250	236	236	5.83%	5.51%	5.51%	106%	106%
R-squared			0.789	0.789					

Chart III-T3



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Table III-T4 shows the calculation of actual-to-expected ratios for General members with 10 or more years of service. Chart III-T4 shows the information graphically along with the 90% confidence interval.

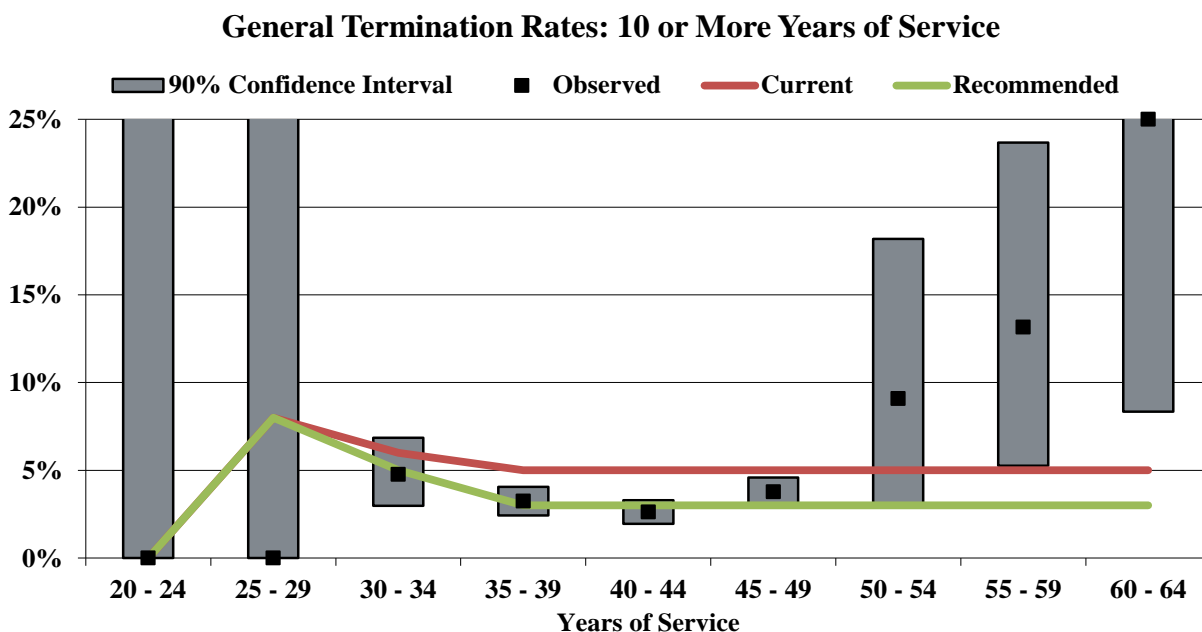
The data shows lower actual termination rates than expected under the current assumption. We recommend adding a separate assumption for General members with 10 or more years of service to better reflect lower rates of termination at higher service levels. The recommended assumption decreases the aggregate assumed rates of termination and increases the aggregate A/E ratio from 69% to 111%. The r-squared decreases slightly to 0.655.

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

Table III-T4

General Termination Rates: 10 or More Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
25 - 29	9	0	1	1	0.00%	8.00%	8.00%	0%	0%
30 - 34	336	16	20	17	4.76%	6.00%	5.00%	79%	95%
35 - 39	1,235	40	62	37	3.24%	5.00%	3.00%	65%	108%
40 - 44	1,490	39	75	45	2.62%	5.00%	3.00%	52%	87%
45 - 49	1,482	56	74	44	3.78%	5.00%	3.00%	76%	126%
50 - 54	33	3	2	1	9.09%	5.00%	3.00%	182%	303%
55 - 59	38	5	2	1	13.16%	5.00%	3.00%	263%	439%
60 - 64	12	3	1	0	25.00%	5.00%	3.00%	500%	833%
Total	4,635	162	235	146	3.50%	5.08%	3.15%	69%	111%
R-squared			0.661	0.655					

Chart III-T4



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Table III-T5 shows the calculation of actual-to-expected ratios for Safety members with less than three years of service. Chart III-T5 shows the information graphically along with the 90% confidence interval.

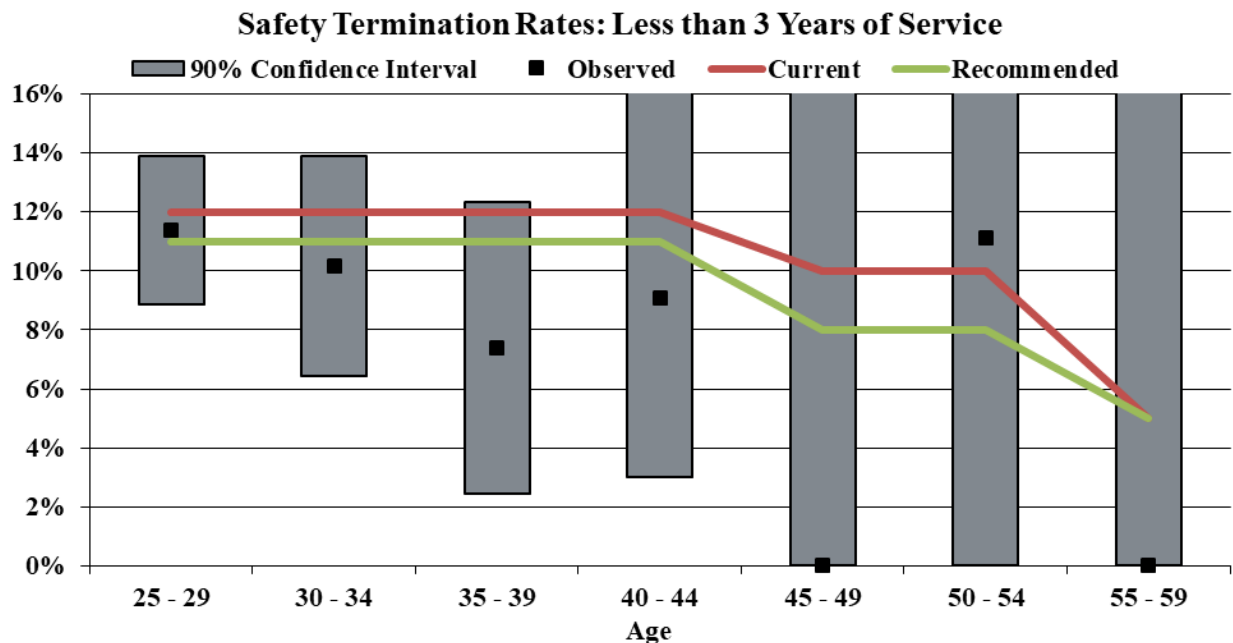
The data shows lower actual termination rates than expected under the current assumption. The recommended assumption decreases the aggregate assumed rates of termination and increases the aggregate A/E ratio from 88% to 96%. The r-squared remains level at 0.851.

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

Table III-T5

Safety Termination Rates: Less than 3 Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	151	17	18	17	11.26%	12.00%	11.00%	94%	102%
25 - 29	439	50	53	48	11.39%	12.00%	11.00%	95%	104%
30 - 34	187	19	22	21	10.16%	12.00%	11.00%	85%	92%
35 - 39	81	6	10	9	7.41%	12.00%	11.00%	62%	67%
40 - 44	33	3	4	4	9.09%	12.00%	11.00%	76%	83%
45 - 49	14	0	1	1	0.00%	10.00%	8.00%	0%	0%
50 - 54	18	2	2	1	11.11%	10.00%	8.00%	111%	139%
55 - 59	9	0	0	0	0.00%	5.00%	5.00%	0%	0%
Total	932	97	111	101	10.41%	11.86%	10.84%	88%	96%
R-squared			0.851	0.851					

Chart III-T5



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

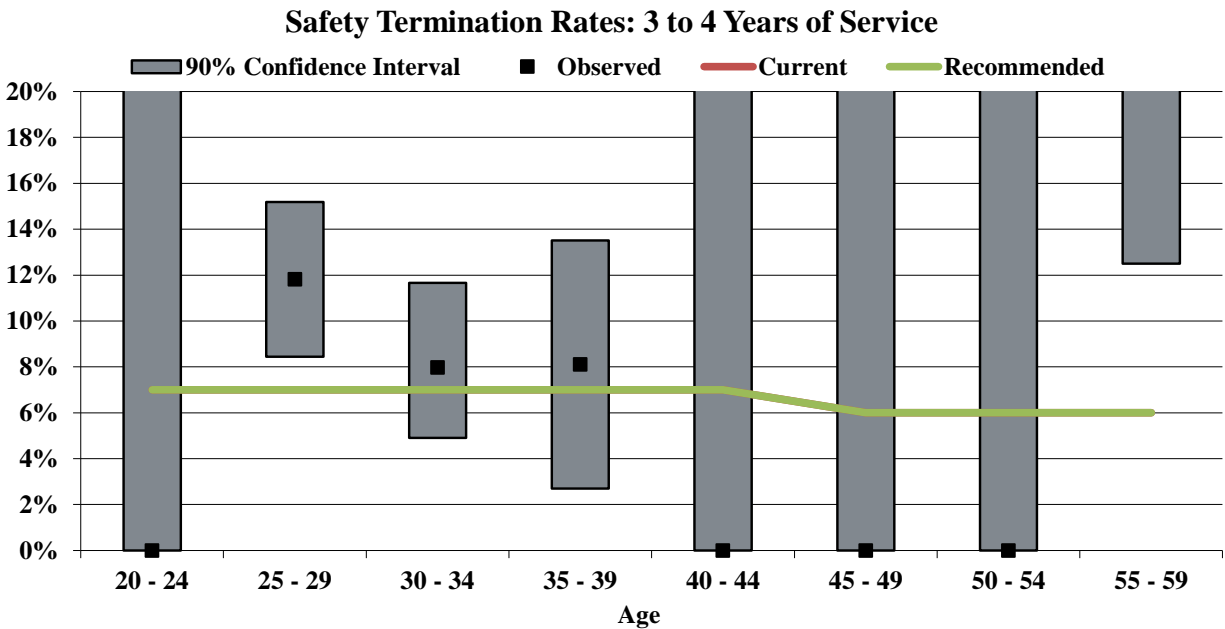
Table III-T6 shows the calculation of actual-to-expected ratios for Safety members with three to four years of service. Chart III-T6 shows the information graphically along with the 90% confidence interval.

The data shows that the actual termination rates are higher in general and in aggregate, but there is limited data for this group; therefore, we are comfortable recommending no change to the assumption.

Table III-T6

Safety Termination Rates: 3 to 4 Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	15	0	1	1	0.00%	7.00%	7.00%	0%	0%
25 - 29	237	28	17	17	11.81%	7.00%	7.00%	169%	169%
30 - 34	163	13	11	11	7.98%	7.00%	7.00%	114%	114%
35 - 39	74	6	5	5	8.11%	7.00%	7.00%	116%	116%
40 - 44	30	0	2	2	0.00%	7.00%	7.00%	0%	0%
45 - 49	19	0	1	1	0.00%	6.00%	6.00%	0%	0%
50 - 54	8	0	0	0	0.00%	6.00%	6.00%	0%	0%
55 - 59	8	3	0	0	37.50%	6.00%	6.00%	625%	625%
Total	554	50	38	38	9.03%	6.94%	6.94%	130%	130%
R-squared			0.841	0.841					

Chart III-T6



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

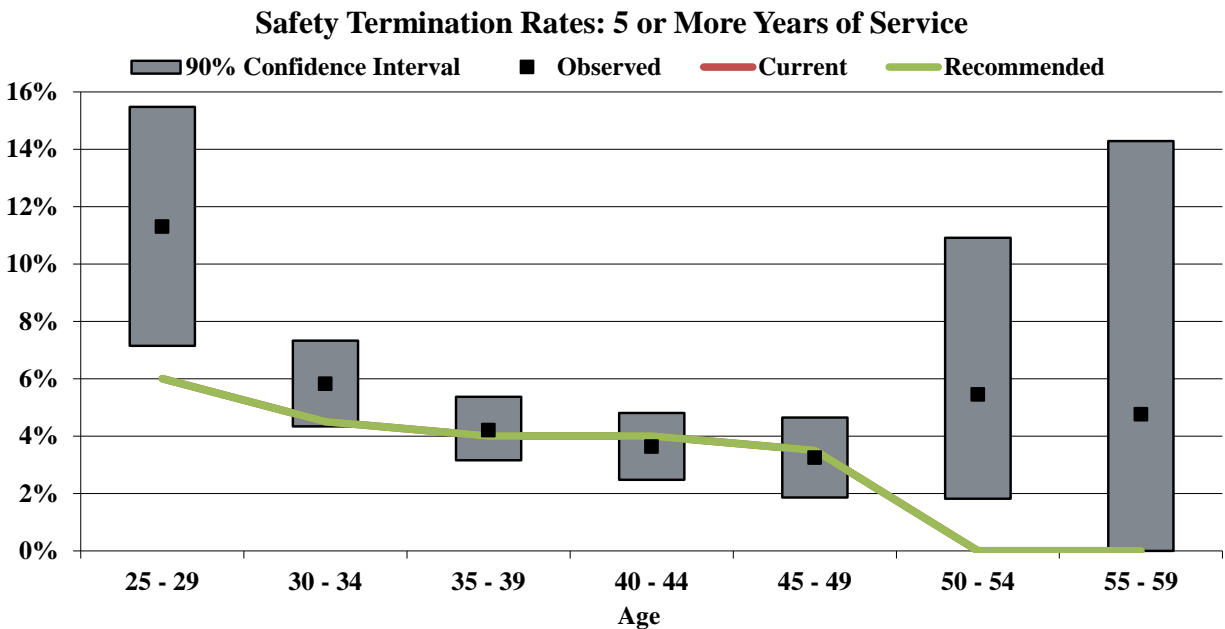
Table III-T7 shows the calculation of actual-to-expected ratios for Safety members with five or more years of service. Chart III-T7 shows the information graphically along with the 90% confidence interval.

The data shows higher actual termination rates than expected under the current assumption. However, there is insufficient credible experience and the actual rates are generally close to the current rates, producing an A/E ratio of 117%. We do not recommend any changes to the current assumption.

Table III-T7

Safety Termination Rates: 5 or More Years of Service									
Age	Exposures	Terminations			Termination Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
25 - 29	168	19	10	10	11.31%	6.00%	6.00%	188%	188%
30 - 34	669	39	30	30	5.83%	4.50%	4.50%	130%	130%
35 - 39	856	36	34	34	4.21%	4.00%	4.00%	105%	105%
40 - 44	687	25	27	27	3.64%	4.00%	4.00%	91%	91%
45 - 49	430	14	15	15	3.26%	3.50%	3.50%	93%	93%
50 - 54	55	3	0	0	5.45%	0.00%	0.00%	0%	0%
55 - 59	21	1	0	0	4.76%	0.00%	0.00%	0%	0%
Total	2,886	137	117	117	4.75%	4.05%	4.05%	117%	117%
R-squared			0.637	0.637					

Chart III-T7



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

TYPES OF TERMINATION

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

Tables III-T8, III-T9, and III-T10 show the comparison of the actual rates to the current and recommended assumptions based on an analysis of members who terminated in the last six years. The percentage of members assumed to receive a deferred vested retirement benefit (i.e., did not elect a refund of contributions) was somewhat higher than expected for General female members, particularly at higher service levels. The rates for General males and all Safety members were reasonably close to the assumed percentages.

We therefore recommend increases to the assumed General female deferred annuity rates, while maintaining the current rates for the other groups. Although the overall experience for the past six years for General female members with 10-15 years of service was lower than the current assumption, we recommend an assumption that is consistent with an increasing likelihood of vested termination rates (and a decreasing rate of refund) as service increases.

Table III-T8

Types of Termination for General Male Members				
Service	Type of Termination	Actual	Current	Recommended
5 - 10	Refund of Contributions	25%	25%	25%
	Deferred Annuity	75%	75%	75%
10 - 15	Refund of Contributions	23%	15%	15%
	Deferred Annuity	77%	85%	85%
15 - 20	Refund of Contributions	11%	15%	15%
	Deferred Annuity	89%	85%	85%
20+	Refund of Contributions	22%	15%	15%
	Deferred Annuity	78%	85%	85%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

Table III-T9

Types of Termination for General Female Members				
Service	Type of Termination	Actual	Current	Recommended
5 - 10	Refund of Contributions	44%	50%	45%
	Deferred Annuity	56%	50%	55%
10 - 15	Refund of Contributions	46%	35%	30%
	Deferred Annuity	54%	65%	70%
15 - 20	Refund of Contributions	27%	35%	25%
	Deferred Annuity	73%	65%	75%
20+	Refund of Contributions	19%	35%	25%
	Deferred Annuity	81%	65%	75%

Table III-T10

Types of Termination for Safety Members				
Service	Type of Termination	Actual	Current	Recommended
5 - 10	Refund of Contributions	33%	40%	40%
	Deferred Annuity	67%	60%	60%
10 - 15	Refund of Contributions	43%	40%	40%
	Deferred Annuity	57%	60%	60%
15 - 20	Refund of Contributions	18%	40%	40%
	Deferred Annuity	82%	60%	60%
20+	Refund of Contributions	9%	0%	0%
	Deferred Annuity	91%	100%	100%

RECIPROCAL TRANSFERS

We reviewed new retirements from deferred vested status during the last six years and the proportion of those retirements representing reciprocal transfers was 57% for General members, and 63% for Safety members. We use this approach of reviewing the percentage of those retiring from deferred status, versus the alternative approach of reviewing the reported rates of reciprocity upon termination, since reciprocity does not have to be reported until retirement.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
TERMINATION RATES**

We recommend a small reduction in the percentage of deferred vested members expected to establish reciprocity from 65% to 60% for General members, with no change to the current assumption that 65% of deferred vested Safety members are reciprocal transfers.

RECIPROCAL PAY INCREASES

If a member terminates employment and works for a reciprocal employer, the member's retirement benefit is ultimately computed using the highest Final Compensation based on employment with the reciprocal employer. For this assumption we recommend our typical approach of using the base wage growth assumption (currently 3.00%), plus the ultimate rate of merit/longevity increases (or 0.50% for General members, and 1.00% for Safety members), to project annual pay increases from the date of termination to the ultimate date of retirement. This approach results in a reduction from the current assumption of 5.00% to 3.50% for General members and 4.00% for Safety members.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

TCERA's disability rates include rates for both ordinary and duty-related disability. For both types of disability, there are currently separate rates for General male members, General female members, and Safety members. The amount of disability experience is fairly limited even with the experience of the prior three-year study period included. Only 73 duty-related disabilities and 33 ordinary disabilities occurred during the last six years for General and Safety combined.

The data shows that actual duty disability rates were higher than expected for female General members. The data also shows that on aggregate, the duty disability rates for male General members and Safety members were close to the expected rates. Therefore, we recommend increasing the female General duty disability rates so they are equal to the male General duty disability rates, while maintaining the current male General and Safety duty disability rates.

For ordinary disability, the data shows that the rates for male General members and Safety members were fairly close to the expected rates; the female General member actual rates were slightly higher than the expected rates. However, given the lack of credible experience and a small difference between the actual and expected rates for ordinary disability for each group, we do not recommend any changes to this assumption.

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

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

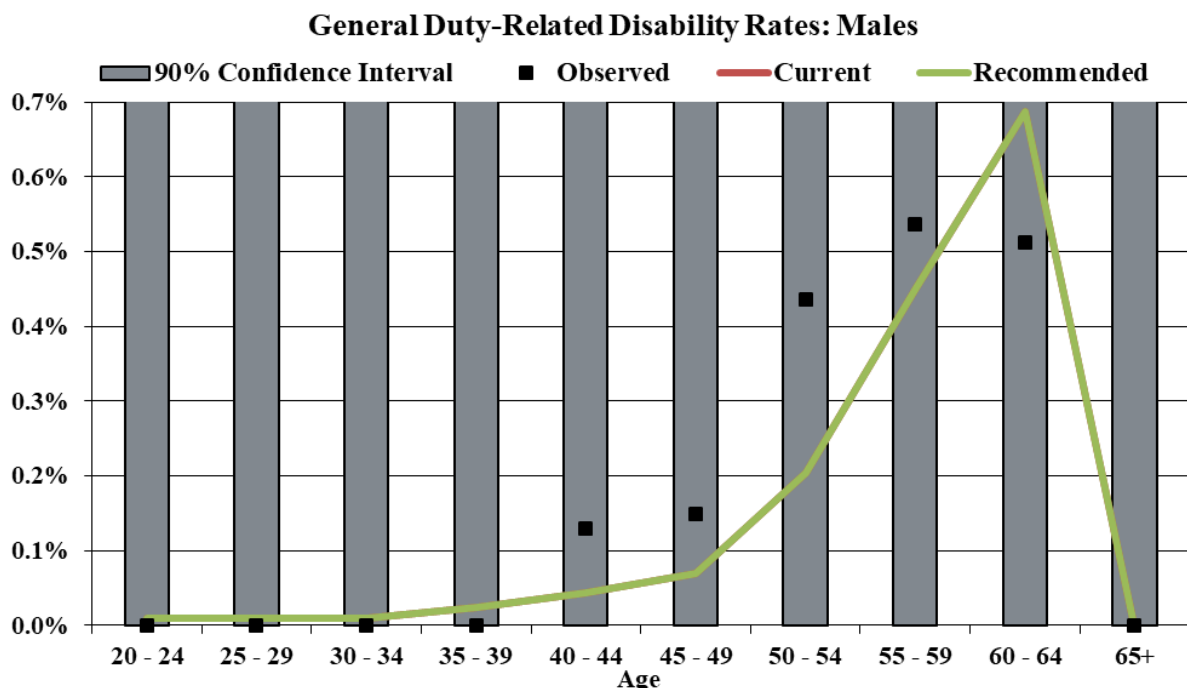
Table III-D1 shows the calculation of actual-to-expected ratios for duty-related disability rates for male General members. Chart III-D1 shows the information graphically along with the 90% confidence interval.

The data shows slightly higher actual disability rates than expected under the current assumption. However, due to having insufficient credible experience and the actual rates being close to the current rates, producing an A/E ratio of 120%, we do not recommend any changes to the current assumption.

Table III-D1

General Duty-Related Disability Rates: Males									
Age	Exposures	Disabilities			Disability Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	126	0	0	0	0.00%	0.01%	0.01%	0%	0%
25 - 29	679	0	0	0	0.00%	0.01%	0.01%	0%	0%
30 - 34	899	0	0	0	0.00%	0.01%	0.01%	0%	0%
35 - 39	910	0	0	0	0.00%	0.02%	0.02%	0%	0%
40 - 44	769	1	0	0	0.13%	0.04%	0.04%	304%	304%
45 - 49	673	1	0	0	0.15%	0.07%	0.07%	212%	212%
50 - 54	688	3	1	1	0.44%	0.20%	0.20%	213%	213%
55 - 59	745	4	3	3	0.54%	0.45%	0.45%	120%	120%
60 - 64	585	3	4	4	0.51%	0.69%	0.69%	75%	75%
65+	262	0	0	0	0.00%	0.00%	0.00%	0%	0%
Total	6,336	12	10	10	0.2%	0.2%	0.2%	120%	120%
R-squared			0.267	0.267					

Chart III-D1



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

Table III-D2 shows the calculation of actual-to-expected ratios for duty-related disability rates for female General members. Chart III-D2 shows the information graphically along with the 90% confidence interval.

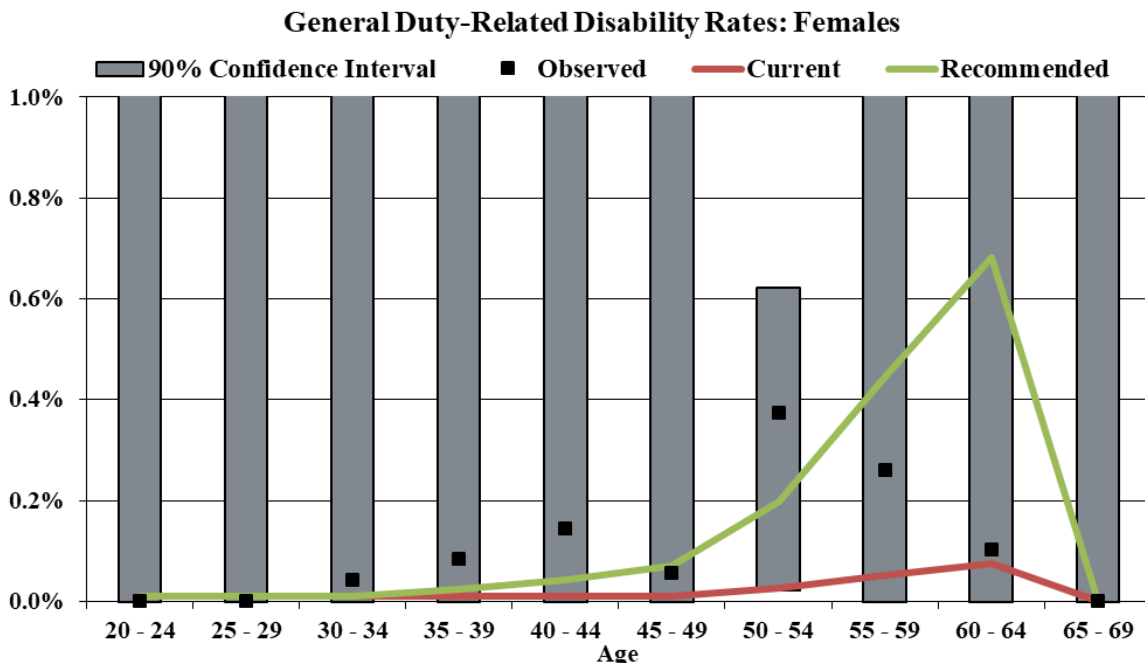
The data shows higher actual disability rates than expected under the current assumption. The recommended assumption increases the aggregate assumed rates of disability and decreases the aggregate A/E ratio from 592% to 91%. The r-squared slightly decreases from 0.073 to 0.061.

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

Table III-D2

General Duty-Related Disability Rates: Females									
Age	Exposures	Disabilities			Disability Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	441	0	0	0	0.00%	0.01%	0.01%	0%	0%
25 - 29	1,837	0	0	0	0.00%	0.01%	0.01%	0%	0%
30 - 34	2,349	1	0	0	0.04%	0.01%	0.01%	426%	426%
35 - 39	2,380	2	0	1	0.08%	0.01%	0.02%	840%	351%
40 - 44	2,085	3	0	1	0.14%	0.01%	0.04%	1439%	336%
45 - 49	1,735	1	0	1	0.06%	0.01%	0.07%	576%	82%
50 - 54	1,608	6	0	3	0.37%	0.03%	0.20%	1343%	189%
55 - 59	1,529	4	1	7	0.26%	0.05%	0.45%	506%	59%
60 - 64	965	1	1	7	0.10%	0.07%	0.68%	138%	15%
65+	362	0	0	0	0.00%	0.00%	0.00%	0%	0%
Total	15,291	18	3	20	0.1%	0.0%	0.1%	592%	91%
R-squared			0.073	0.061					

Chart III-D2



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

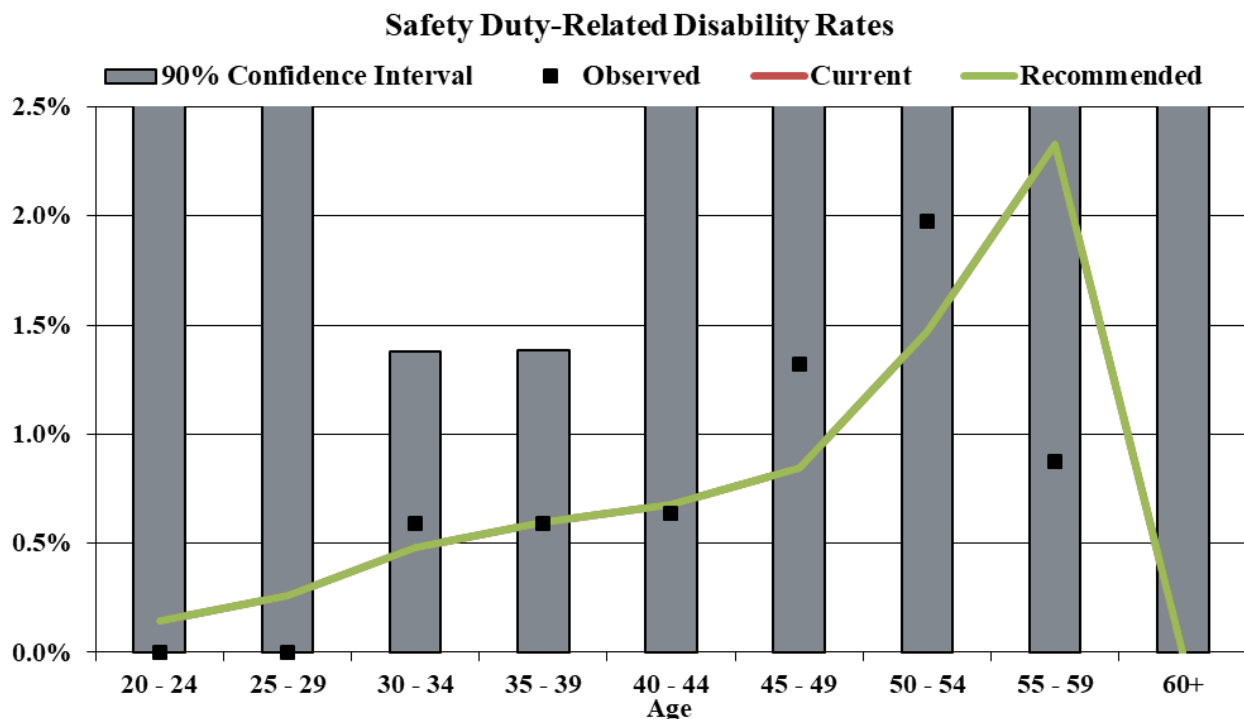
Table III-D3 shows the calculation of actual-to-expected ratios for duty-related disability rates for Safety members. Chart III-D2 shows the information graphically along with the 90% confidence interval.

The data shows slightly higher actual duty-related disability rates than expected under the current assumption. However, due to having insufficient credible experience and the actual rates being close to the current rates, producing an A/E ratio of 115%, we do not recommend any changes to the current assumption.

Table III-D3

Safety Duty-Related Disability Rates									
Age	Exposures	Disabilities			Disability Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	166	0	0	0	0.0%	0.1%	0.1%	0%	0%
25 - 29	844	0	2	2	0.0%	0.3%	0.3%	0%	0%
30 - 34	1,019	6	5	5	0.6%	0.5%	0.5%	122%	122%
35 - 39	1,012	6	6	6	0.6%	0.6%	0.6%	99%	99%
40 - 44	787	5	5	5	0.6%	0.7%	0.7%	94%	94%
45 - 49	681	9	6	6	1.3%	0.8%	0.8%	156%	156%
50 - 54	506	10	7	7	2.0%	1.5%	1.5%	134%	134%
55 - 59	228	2	5	5	0.9%	2.3%	2.3%	38%	38%
60+	136	5	0	0	3.7%	0.0%	0.0%	0%	0%
Total	5,379	43	37	37	0.8%	0.7%	0.7%	115%	115%
R-squared			0.073	0.073					

Chart III-D3



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

Tables III-D4, III-D5, and III-D6 show the calculation of actual-to-expected ratios for ordinary disability rates for male General members, female General members, and all Safety members, respectively.

Due to the lack of credible disability experience for these groups, we do not recommend any changes to the current assumptions.

Table III-D4

General Ordinary Disability Rates: Males									
Age	Exposures	Disabilities			Disability Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	126	0	0	0	0.00%	0.00%	0.00%	0%	0%
25 - 29	679	0	0	0	0.00%	0.01%	0.01%	0%	0%
30 - 34	899	0	0	0	0.00%	0.01%	0.01%	0%	0%
35 - 39	910	0	0	0	0.00%	0.02%	0.02%	0%	0%
40 - 44	769	0	0	0	0.00%	0.04%	0.04%	0%	0%
45 - 49	673	0	0	0	0.00%	0.06%	0.06%	0%	0%
50 - 54	688	1	1	1	0.15%	0.12%	0.12%	117%	117%
55 - 59	745	2	2	2	0.27%	0.22%	0.22%	122%	122%
60 - 64	585	2	2	2	0.34%	0.31%	0.31%	109%	109%
65+	262	0	0	0	0.00%	0.00%	0.00%	0%	0%
Total	6,336	5	5	5	0.08%	0.09%	0.09%	92%	92%
R-squared			0.271	0.271					

Table III-D5

General Ordinary Disability Rates: Females									
Age	Exposures	Disabilities			Disability Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	441	0	0	0	0.00%	0.00%	0.00%	0%	0%
25 - 29	1,837	0	0	0	0.00%	0.01%	0.01%	0%	0%
30 - 34	2,349	1	0	0	0.04%	0.01%	0.01%	426%	426%
35 - 39	2,380	2	2	2	0.08%	0.10%	0.10%	86%	86%
40 - 44	2,085	2	3	3	0.10%	0.17%	0.17%	57%	57%
45 - 49	1,735	3	4	4	0.17%	0.24%	0.24%	72%	72%
50 - 54	1,608	5	5	5	0.31%	0.34%	0.34%	92%	92%
55 - 59	1,529	5	7	7	0.33%	0.45%	0.45%	73%	73%
60 - 64	965	1	6	6	0.10%	0.58%	0.58%	18%	18%
65+	362	0	0	0	0.00%	0.00%	0.00%	0%	0%
Total	15,291	19	28	28	0.12%	0.19%	0.19%	67%	67%
R-squared			0.227	0.227					

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
DISABILITY RATES**

Table III-D6

Safety Ordinary Disability Rates									
Age	Exposures	Disabilities			Disability Rates			A/E Ratios	
		Actual	Current	Recommended	Actual	Current	Recommended	Current	Recommended
20 - 24	166	0	0	0	0.00%	0.00%	0.00%	0%	0%
25 - 29	844	0	0	0	0.00%	0.05%	0.05%	0%	0%
30 - 34	1,019	1	1	1	0.10%	0.05%	0.05%	196%	196%
35 - 39	1,012	1	1	1	0.10%	0.05%	0.05%	198%	198%
40 - 44	787	4	1	1	0.51%	0.08%	0.08%	629%	629%
45 - 49	681	0	1	1	0.00%	0.15%	0.15%	0%	0%
50 - 54	506	2	2	2	0.40%	0.39%	0.39%	100%	100%
55 - 59	228	1	1	1	0.44%	0.63%	0.63%	70%	70%
60+	136	0	0	0	0.00%	0.00%	0.00%	0%	0%
Total	5,379	9	7	7	0.17%	0.12%	0.12%	137%	137%
R-squared			0.010	0.010					

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**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 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 TCERA.
2. Compare actual TCERA 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 TCERA 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.

In general, we recommend assumption changes when the Actual-to-Expected (A/E) ratio for the current assumption is significantly different than 100%.

At the time of the last experience study in 2017, we recommended the continued use of the RP-2014 mortality tables to predict near-term mortality experience for TCERA, with additional future improvements based on the most recent improvement scale produced by the Society of Actuaries' Retirement Plans Experience Committee (RPEC) at that time (the MP-2016 improvement scale). RPEC recently completed an extensive mortality study of public sector pension plans, and issued a new set of tables based on experience from this population. As part of this study, we reviewed TCERA's experience compared to both the RP-2014 base tables and the new public sector base tables, and found that the RP-2014 continues to provide a reasonable predictor of mortality experience for the TCERA population.

Since the prior experience study, RPEC has also continued to release new mortality improvement scales, with the most recent one (Scale MP-2019) reflecting three more years of Social Security data (2015-2017) than was used in the development of Scale MP-2016. It also reflects lower expected improvement rates than Scale MP-2016, based on further slowing in mortality improvement.

MP-2019, similar to MP-2016, represents the Society of Actuaries' recommended 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-2019 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.

The TCERA experience is only partially credible, particularly for Safety, based on standard statistical theory. TCERA healthy annuitants, besides General males, experienced overall higher

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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

rates of death than expected, with a 108% actual-to-expected ratio for General females, a 150% actual-to-expected ratio for Safety females (though experience in this category is limited), and a 121% actual-to-expected ratio for Safety males. TCERA healthy General males experienced overall lower rates of death than expected, with a 95% actual-to-expected ratio. We do not recommend any changes to the current adjustments to the RP-2014 base tables for General females or Safety members. However, we do recommend lowering the increase to the base table for General males from 12.1% to 2.2% and using MP-2019 to project future mortality improvements.

As there is very little experience for TCERA disabled retirees, with only 53 deaths over the six-year period, we recommend no changes to the base tables for both General and Safety. Similarly, there were only 33 active deaths over the three-year period, so we recommend the continued use of the non-annuitant rates associated with the base tables along with the same adjustments as for healthy annuitants. Furthermore, we recommend no change to the percentage of Safety deaths assumed to be duty-related due to lack of data.

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

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

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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Healthy General active members, retirees, and beneficiaries

- The sex distinct Retired Pensioners (RP) 2014 Combined Healthy Tables, published by the Society of Actuaries, with Generational improvements using Projection Scale MP-2019, and increased by 2.2% for males and 8.0% for females to reflect Plan experience.

Healthy Safety active members, retirees, and beneficiaries

- The sex distinct Retired Pensioners (RP) 2014 Combined Healthy Tables with blue-collar adjustment, published by the Society of Actuaries, with Generational improvements using Projection Scale MP-2019, and increased by 4.5% for males to reflect Plan experience.

Disabled members

- The sex distinct Retired Pensioners (RP) 2014 Disabled Retiree Mortality Table, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2019.

Tables III-M1, III-M2, III-M3, and III-M4 on the following pages show the calculation of actual-to-expected healthy annuitant death ratios for General male, General female, Safety male, and Safety female members, respectively. Charts III-M1, III-M2, III-M3, and III-M4 show the information graphically along with the 90% confidence intervals.

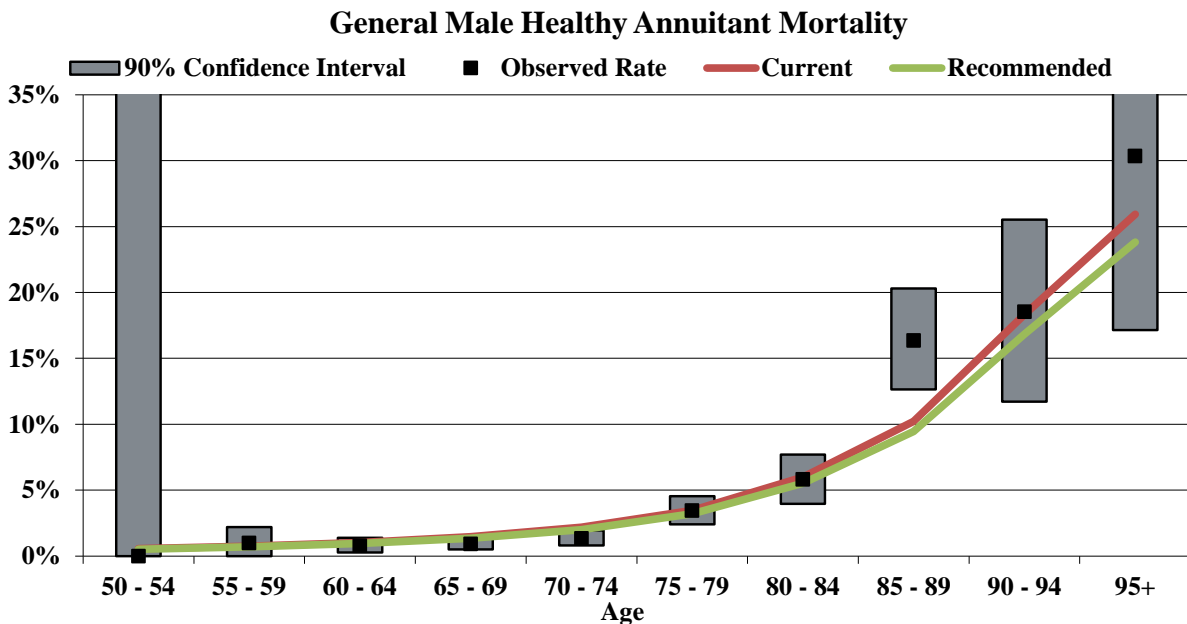
**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Table III-M1

Healthy Annuitant Mortality - Base Table for General Males								
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Recommended	Current	Recommended
50 - 54	88	0	71,372	0	392	363	0%	0%
55 - 59	273	2	372,749	3,696	2,754	2,569	134%	144%
60 - 64	719	6	1,316,502	10,249	13,564	12,654	76%	81%
65 - 69	1,226	17	2,957,738	27,117	43,303	39,856	63%	68%
70 - 74	1,238	26	2,906,788	39,092	63,296	58,130	62%	67%
75 - 79	751	26	1,519,699	52,303	52,531	48,540	100%	108%
80 - 84	455	33	703,593	40,838	42,219	38,954	97%	105%
85 - 89	261	39	441,224	72,147	45,056	41,671	160%	173%
90 - 94	94	24	170,292	31,549	31,171	28,658	101%	110%
95 +	35	8	50,817	15,427	13,179	12,102	117%	127%
Total	5,140	181	10,510,776	292,418	307,466	283,498	95%	103%
R-Squared					0.394	0.397		

Chart III-M1



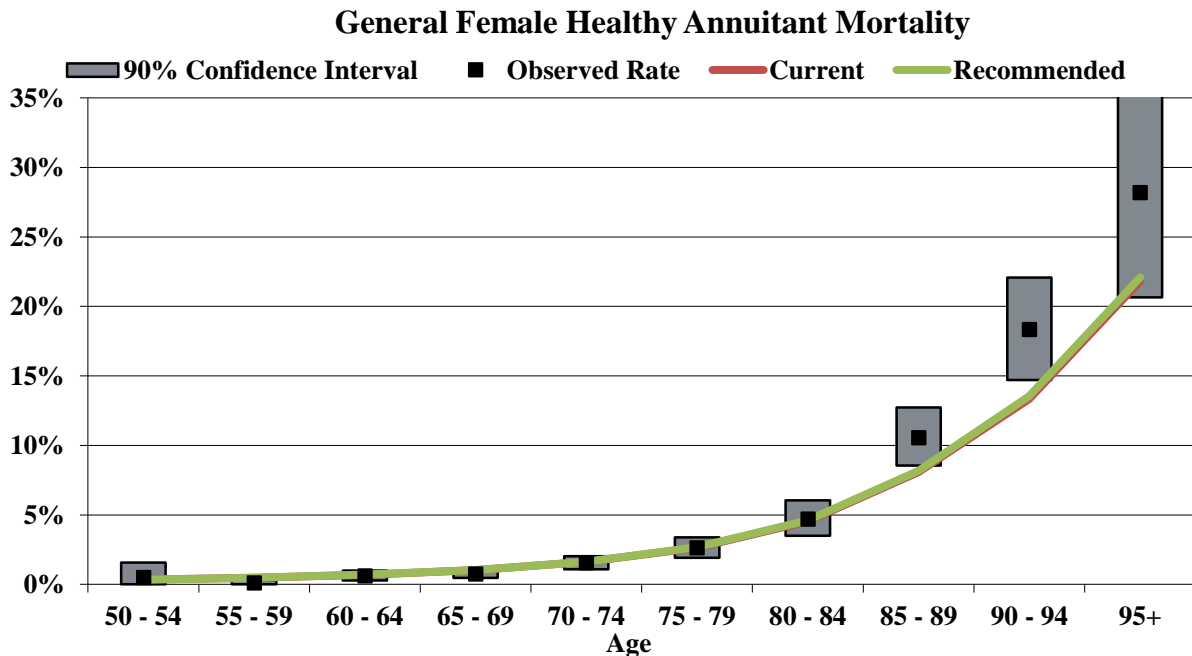
**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
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**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Table III-M2

Healthy Annuitant Mortality - Base Table for General Females								
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Recommended	Current	Recommended
50 - 54	190	1	172,798	841	595	607	142%	139%
55 - 59	645	3	821,193	803	3,864	3,976	21%	20%
60 - 64	1,423	10	2,323,684	14,168	15,918	16,253	89%	87%
65 - 69	2,109	19	3,369,706	25,264	34,845	35,043	73%	72%
70 - 74	1,921	29	2,978,718	46,134	48,268	48,628	96%	95%
75 - 79	1,153	29	1,696,877	44,520	44,701	45,339	100%	98%
80 - 84	745	37	951,125	44,615	43,211	43,831	103%	102%
85 - 89	597	57	758,006	79,992	61,191	62,027	131%	129%
90 - 94	299	43	341,087	62,560	45,500	46,240	137%	135%
95 +	92	27	76,853	21,658	16,778	16,968	129%	128%
Total	9,174	255	13,490,045	340,555	314,871	318,912	108%	107%
R-Squared					0.632	0.634		

Chart III-M2



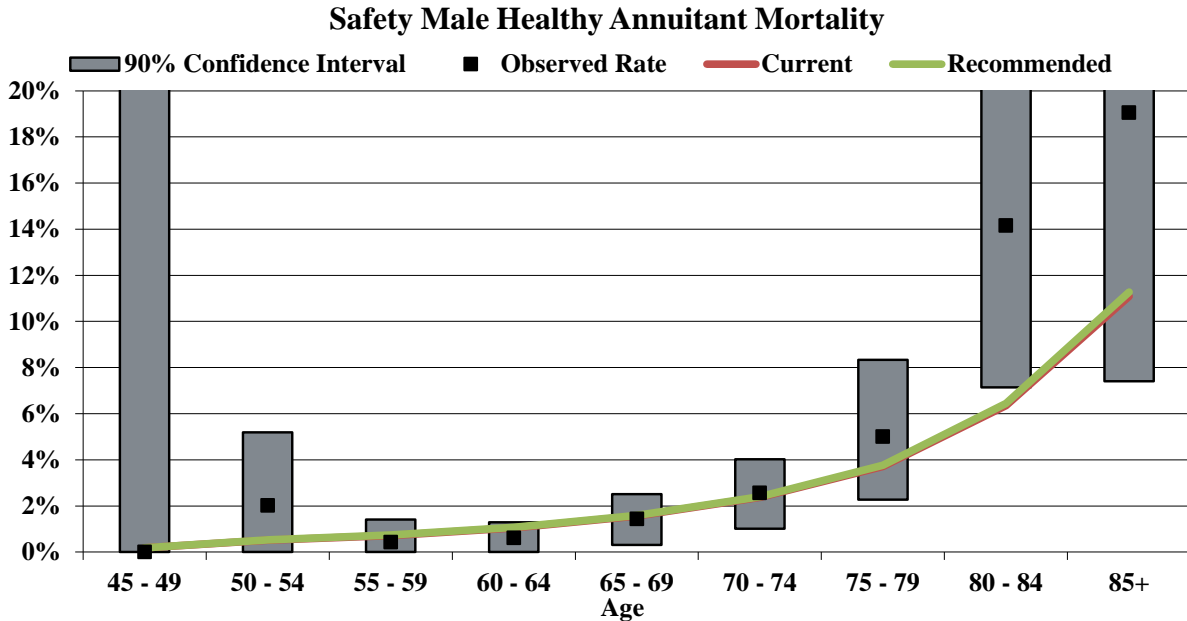
**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Table III-M3

Healthy Annuitant Mortality - Base Table for Safety Males								
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Recommended	Current	Recommended
45 - 49	3	0	5,137	0	9	9	0%	0%
50 - 54	77	1	127,697	2,576	660	673	390%	383%
55 - 59	213	1	707,393	3,053	5,083	5,227	60%	58%
60 - 64	310	2	1,176,223	7,180	12,314	12,605	58%	57%
65 - 69	318	4	1,266,878	18,219	19,845	20,051	92%	91%
70 - 74	298	5	1,036,596	26,602	24,651	24,828	108%	107%
75 - 79	132	7	411,443	20,596	15,281	15,499	135%	133%
80 - 84	56	7	199,601	28,264	12,675	12,850	223%	220%
85+	27	4	62,361	11,881	6,916	7,030	172%	169%
Total	1,434	31	4,993,329	118,370	97,434	98,772	121%	120%
R-Squared					0.296	0.295		

Chart III-M3



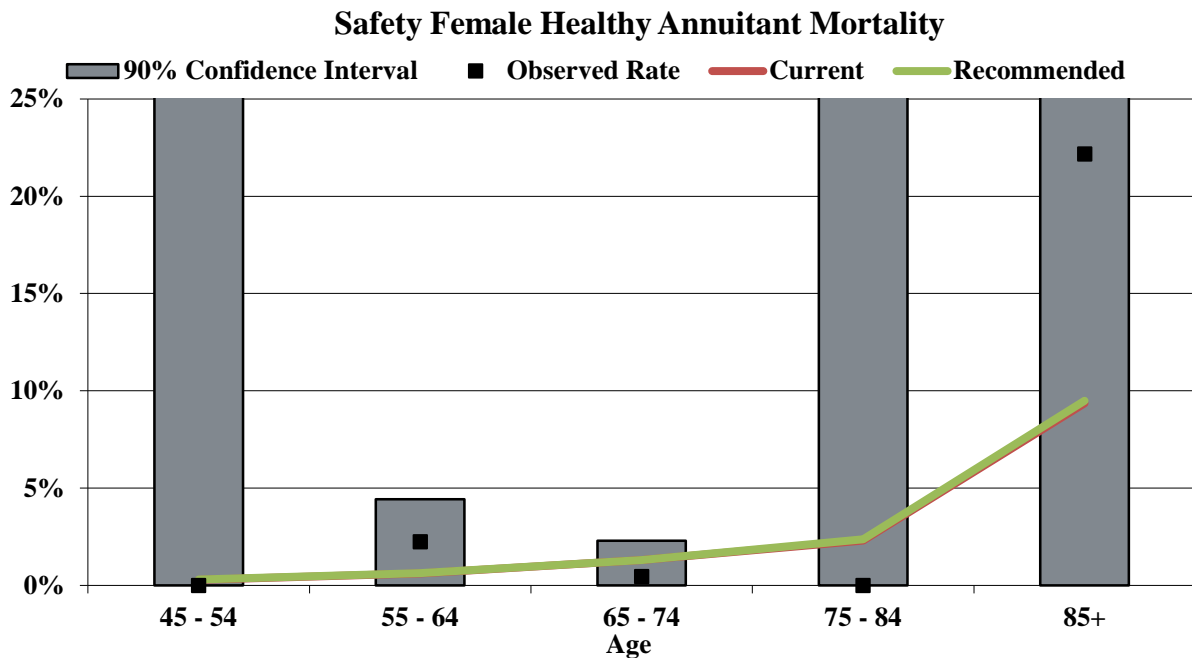
**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**SECTION III – DEMOGRAPHIC ASSUMPTIONS
MORTALITY RATES**

Table III-M4

Healthy Annuitant Mortality - Base Table for Safety Females								
Age Band	Exposures	Actual Deaths	Weighted Exposures	Weighted Deaths			A/E Ratios	
				Actual	Current	Recommended	Current	Recommended
45 - 54	27	0	48,423	0	140	143	0%	0%
55 - 64	113	1	306,572	6,871	1,860	1,909	369%	360%
65 - 74	87	1	290,554	1,308	3,757	3,795	35%	34%
75 - 84	6	0	17,008	0	390	403	0%	0%
85+	7	2	12,832	2,845	1,200	1,217	237%	234%
Total	240	4	675,389	11,025	7,348	7,467	150%	148%
R-Squared					0.033	0.034		

Chart III-M4



**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

**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 – 52 total disabled deaths and 33 total active deaths – over the six-year period, which is not enough data to produce sufficiently credible assumptions. We recommend continuing the practice of aligning non-annuitant mortality assumptions with the respective annuitant mortality discussed above.

Additionally, there is limited data for duty-related Safety member deaths. The data shows five non-annuitant deaths for all Safety members over the six-year study period. Given the lack of credible data, we recommend no change to the percentage of deaths assumed to be duty-related.

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 RP-2014 tables with adjustments) projected using Scale MP-2019 from 2014 to 2045. These static projections are intended to approximate generational mortality improvements.

The projection periods are based upon the duration of active liabilities for the respective affected groups (approximately 22 years), and the period during which the associated employee contribution rates will be in use (central year of 2023). The employee contribution rates are also blended using a male/female weighting of 30%/70% for General Members and 75%/25% for Safety members.

We anticipate that these mortality assumptions will be used to determine the employee contribution rates in effect for the period of July 1, 2021 through June 30, 2024. 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, 2020 through June 30, 2023.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

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

FAMILY COMPOSITION

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

An analysis of all retired General members showed that 77% of males are married and 54% of females are married. Over the last six years, the percentages of members retiring with a spouse are 78% for males and 59% for females. We recommend reducing the marriage assumption for future male General retirees from 85% to 80% and reducing the assumption for future female General retirees from 65% to 60%.

An analysis of all retired Safety members showed that 83% of males and 56% of females are married. Over the last six years, the percentages of members retiring with a spouse are 83% for males and 62% for females. We recommend reducing the marriage assumption for future male Safety retirees from 90% to 85% and reducing the assumption for future female Safety retirees from 70% to 65%.

An analysis of all retired General members showed that on average male members are 3.2 years older than their spouses are and female members are 1.7 years younger than their spouses are. Similarly, an analysis of all retired Safety members showed that on average male members are 2.5 years older than their spouses and female members are 2.3 years younger than their spouses. We recommend maintaining the current assumption that male members are three years older than their spouse and that female members are two years younger than their spouse.

SICK LEAVE SERVICE LOAD

Members who are eligible for service retirement can convert unused sick leave to benefit service. An analysis of 105 recent individual retirement calculations showed that, on average, leave conversions added roughly 1.1% and 2.0% to benefit service for General members and Safety members, respectively. Adding salary weights to the analysis yielded similar results and the loads are not materially different between groups with longer or shorter periods of service. Consequently, we recommend adding a flat benefit service load of 1% for General members and 2% for Safety members in determining liabilities for future service retirements.

DEFERRED RETIREMENT AGE

An analysis of all terminated members with a vested right to a benefit, who retired in the last six years, showed that on average General members retire at age 60.8 and Safety members retire at age 56.1. We recommend maintaining the assumption of age 60 for General members, and changing the assumption from age 53 to age 55 for Safety members.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

The recommended economic assumptions and the majority of the demographic assumptions were adopted by the Board at their September 23, 2020 meeting, with the remainder of the demographic assumptions scheduled for consideration at the October 28, 2020 Board meeting. The assumptions are based on an experience study covering the period from July 1, 2017 through June 30, 2020.

1. Rate of Return

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

2. Inflation

The Consumer Price Index (CPI) is assumed to increase at the rate of 2.75% per year.

3. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.6% per year for Tier 1 and 2% per year for Tiers 2-4.

4. Internal Revenue Code Limits and PEPRA Pensionable Compensation Limits

The maximum benefit and maximum compensation limitations under Internal Revenue Code Sections 415 and 401(a)(17), respectively, are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement. The PEPRA compensation limit, which was \$126,291 for calendar year 2020 for members participating in Social Security, was applied.

5. Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 7.00%.

6. Family Composition

Percentage married for deferred vested terminations and all active members who retire, become disabled, or die during active service is shown below. Spouses of male members are assumed to be female and three years younger. Spouses of female members are assumed to be male and two years older. Actual spouse demographic data is reflected following benefit commencement.

Division	Gender	Percentage
General	Male	80%
General	Female	60%
Safety	Male	85%
Safety	Female	65%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

7. Increases in Pay

Wage inflation component: 3.00% (this assumption is also used to project the compensation limit for PEPRAs members)

Additional longevity and promotion component:

Longevity and Promotion Increases		
Service	General	Safety
0	8.00%	9.00%
1	6.50%	6.00%
2	5.50%	5.00%
3	4.00%	3.00%
4	3.00%	3.00%
5	2.00%	2.00%
6	1.75%	2.00%
7	1.50%	2.00%
8	1.00%	1.00%
9	1.00%	1.00%
10	1.00%	1.00%
11	1.00%	1.00%
12	1.00%	1.00%
13	1.00%	1.00%
14	1.00%	1.00%
15+	0.50%	1.00%

8. Sick Leave Service Credit Upon Service Retirement

Active members' service retirement benefits are adjusted by a percentage, 1% for General and 2% for Safety, for anticipated conversions of sick leave to retirement service credit.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

9. Termination

Age	Rates of Termination						
	General				Safety		
	Years of Service				Years of Service		
	Less than 3	3 to 5	5 to 10	10 or more	Less than 3	3 to 5	5 or more
20	15.00%	12.00%	10.00%	10.00%	11.00%	7.00%	6.00%
21	15.00%	12.00%	10.00%	10.00%	11.00%	7.00%	6.00%
22	15.00%	12.00%	10.00%	10.00%	11.00%	7.00%	6.00%
23	15.00%	12.00%	10.00%	10.00%	11.00%	7.00%	6.00%
24	15.00%	12.00%	10.00%	10.00%	11.00%	7.00%	6.00%
25	15.00%	8.00%	8.00%	8.00%	11.00%	7.00%	6.00%
26	15.00%	8.00%	8.00%	8.00%	11.00%	7.00%	6.00%
27	15.00%	8.00%	8.00%	8.00%	11.00%	7.00%	6.00%
28	15.00%	8.00%	8.00%	8.00%	11.00%	7.00%	6.00%
29	15.00%	8.00%	8.00%	8.00%	11.00%	7.00%	6.00%
30	15.00%	8.00%	6.00%	5.00%	11.00%	7.00%	4.50%
31	15.00%	8.00%	6.00%	5.00%	11.00%	7.00%	4.50%
32	15.00%	8.00%	6.00%	5.00%	11.00%	7.00%	4.50%
33	15.00%	8.00%	6.00%	5.00%	11.00%	7.00%	4.50%
34	15.00%	8.00%	6.00%	5.00%	11.00%	7.00%	4.50%
35	15.00%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
36	15.00%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
37	15.00%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
38	15.00%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
39	15.00%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
40	14.25%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
41	14.25%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
42	14.25%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
43	14.25%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
44	14.25%	8.00%	5.00%	3.00%	11.00%	7.00%	4.00%
45	13.50%	8.00%	5.00%	3.00%	8.00%	6.00%	3.50%
46	13.50%	8.00%	5.00%	3.00%	8.00%	6.00%	3.50%
47	13.50%	8.00%	5.00%	3.00%	8.00%	6.00%	3.50%
48	13.50%	8.00%	5.00%	3.00%	8.00%	6.00%	3.50%
49	13.50%	8.00%	5.00%	3.00%	8.00%	6.00%	3.50%
50	12.75%	5.00%	5.00%	3.00%	8.00%	6.00%	0.00%
51	12.75%	5.00%	5.00%	3.00%	8.00%	6.00%	0.00%
52	12.75%	5.00%	5.00%	3.00%	8.00%	6.00%	0.00%
53	12.75%	5.00%	5.00%	3.00%	8.00%	6.00%	0.00%
54	12.75%	5.00%	5.00%	3.00%	8.00%	6.00%	0.00%
55	12.00%	5.00%	5.00%	3.00%	5.00%	6.00%	0.00%
56	12.00%	5.00%	5.00%	3.00%	5.00%	6.00%	0.00%
57	12.00%	5.00%	5.00%	3.00%	5.00%	6.00%	0.00%
58	12.00%	5.00%	5.00%	3.00%	5.00%	6.00%	0.00%
59	12.00%	5.00%	5.00%	3.00%	5.00%	6.00%	0.00%
60	11.25%	5.00%	5.00%	3.00%	0.00%	0.00%	0.00%
61	11.25%	5.00%	5.00%	3.00%	0.00%	0.00%	0.00%
62	11.25%	5.00%	5.00%	3.00%	0.00%	0.00%	0.00%
63	11.25%	5.00%	5.00%	3.00%	0.00%	0.00%	0.00%
64	11.25%	5.00%	5.00%	3.00%	0.00%	0.00%	0.00%
65 and over	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

Rates of termination apply to active Members who terminate their employment. Rates are assumed not to apply after eligibility for retirement.

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

General Members: Age 60
Safety Members: Age 55

10. Rates of Deferred Vested Termination

Rates of deferred vested termination are a percentage of the termination rates shown on the previous page.

Service	General Males	General Females	Safety
5-10	75%	55%	60%
10-15	85%	70%	60%
15-20	85%	75%	60%
20+	85%	75%	100%

11. Reciprocal Transfers

60% of General and 65% of Safety deferred vested terminated 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 3.50% for General members and 4.00% for Safety members.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

12. Rates of Disability

Disability rates of active participants are shown below.

Age	Rates of Disability					
	General - Males		General - Females		Safety	
	Ordinary	Duty	Ordinary	Duty	Ordinary	Duty
20	0.000%	0.010%	0.000%	0.010%	0.000%	0.110%
21	0.000%	0.010%	0.000%	0.010%	0.000%	0.120%
22	0.000%	0.010%	0.000%	0.010%	0.000%	0.130%
23	0.000%	0.010%	0.000%	0.010%	0.000%	0.140%
24	0.000%	0.010%	0.000%	0.010%	0.000%	0.150%
25	0.010%	0.010%	0.010%	0.010%	0.050%	0.170%
26	0.010%	0.010%	0.010%	0.010%	0.050%	0.200%
27	0.010%	0.010%	0.010%	0.010%	0.050%	0.250%
28	0.010%	0.010%	0.010%	0.010%	0.050%	0.300%
29	0.010%	0.010%	0.010%	0.010%	0.050%	0.350%
30	0.010%	0.010%	0.010%	0.010%	0.050%	0.400%
31	0.010%	0.010%	0.010%	0.010%	0.050%	0.450%
32	0.010%	0.010%	0.010%	0.010%	0.050%	0.500%
33	0.010%	0.010%	0.010%	0.010%	0.050%	0.520%
34	0.010%	0.010%	0.010%	0.010%	0.050%	0.540%
35	0.020%	0.020%	0.080%	0.020%	0.050%	0.560%
36	0.020%	0.020%	0.080%	0.020%	0.050%	0.580%
37	0.020%	0.020%	0.080%	0.020%	0.050%	0.600%
38	0.030%	0.030%	0.120%	0.030%	0.050%	0.620%
39	0.030%	0.030%	0.130%	0.030%	0.050%	0.640%
40	0.030%	0.030%	0.140%	0.030%	0.075%	0.660%
41	0.040%	0.045%	0.160%	0.045%	0.075%	0.670%
42	0.040%	0.045%	0.170%	0.045%	0.080%	0.680%
43	0.040%	0.045%	0.180%	0.045%	0.085%	0.690%
44	0.050%	0.050%	0.190%	0.050%	0.090%	0.700%
45	0.050%	0.055%	0.200%	0.055%	0.095%	0.750%
46	0.050%	0.060%	0.220%	0.060%	0.100%	0.800%
47	0.060%	0.070%	0.240%	0.070%	0.150%	0.850%
48	0.070%	0.080%	0.260%	0.080%	0.200%	0.900%
49	0.080%	0.090%	0.280%	0.090%	0.250%	0.950%
50	0.090%	0.100%	0.300%	0.100%	0.300%	1.000%
51	0.100%	0.150%	0.320%	0.150%	0.350%	1.250%
52	0.120%	0.200%	0.340%	0.200%	0.400%	1.500%
53	0.140%	0.250%	0.360%	0.250%	0.450%	1.750%
54	0.160%	0.300%	0.380%	0.300%	0.500%	2.000%
55	0.180%	0.350%	0.400%	0.350%	0.550%	2.250%
56	0.200%	0.400%	0.420%	0.400%	0.600%	2.300%
57	0.220%	0.450%	0.440%	0.450%	0.650%	2.350%
58	0.240%	0.500%	0.480%	0.500%	0.700%	2.400%
59	0.260%	0.550%	0.520%	0.550%	0.750%	2.450%
60	0.280%	0.600%	0.540%	0.600%	0.000%	0.000%
61	0.300%	0.650%	0.560%	0.650%	0.000%	0.000%
62	0.320%	0.700%	0.600%	0.700%	0.000%	0.000%
63	0.340%	0.750%	0.620%	0.750%	0.000%	0.000%
64	0.360%	0.800%	0.640%	0.800%	0.000%	0.000%
65 and over	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

13. Rates of Mortality for Healthy Lives

Mortality rates for General actives, retirees, beneficiaries, terminated vested, and reciprocals are based on the sex distinct Retired Pensioner (RP) 2014 Combined Healthy Tables, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2019, and increased by 2.2% for males and 8.0% for females to reflect Plan experience.

Mortality rates for Safety actives, retirees, beneficiaries, terminated vested, and reciprocals are based on the sex distinct Retired Pensioner (RP) 2014 Combined Healthy Tables with blue-collar adjustment, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2019, and increased by 4.5% for males to reflect Plan experience.

14. Rates of Mortality for Retired Disabled Lives

Mortality rates for disabled retirees are based on the sex distinct Retired Pensioner (RP) 2014 Disabled Retiree Mortality Table, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2019.

15. Duty-Related Deaths (Safety Employees Only)

Percentage of deaths assumed to be duty related	
Age	
20-24	37%
25-30	42%
31-34	45%
35-43	50%
44-45	52%
46-47	54%
48-49	56%
50-54	58%
55-56	60%
57-58	62%
59	63%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY REPORT AS OF JUNE 30, 2020**

APPENDIX A – SUMMARY OF RECOMMENDED ASSUMPTIONS

16. Rates of Retirement

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

Age	General		Safety	
	Years of Service		Years of Service	
	Less than 30	30 or more	Less than 20	20 or more
45	0.00%	0.00%	7.00%	7.00%
46	0.00%	0.00%	7.00%	7.00%
47	0.00%	0.00%	7.00%	7.00%
48	0.00%	0.00%	7.00%	7.00%
49	0.00%	0.00%	7.00%	7.00%
50	5.00%	10.00%	7.00%	7.00%
51	5.00%	10.00%	7.00%	7.00%
52	5.00%	10.00%	7.00%	7.00%
53	5.00%	10.00%	7.00%	7.00%
54	5.00%	10.00%	7.00%	7.00%
55	6.00%	10.00%	10.00%	18.00%
56	6.00%	10.00%	10.00%	18.00%
57	6.00%	10.00%	10.00%	18.00%
58	6.00%	10.00%	10.00%	18.00%
59	6.00%	10.00%	10.00%	18.00%
60	15.00%	20.00%	20.00%	40.00%
61	15.00%	20.00%	20.00%	40.00%
62	15.00%	20.00%	20.00%	40.00%
63	15.00%	20.00%	20.00%	40.00%
64	15.00%	20.00%	20.00%	40.00%
65	35.00%	35.00%	40.00%	75.00%
66	35.00%	35.00%	40.00%	75.00%
67	35.00%	35.00%	40.00%	75.00%
68	35.00%	35.00%	40.00%	75.00%
69	35.00%	35.00%	40.00%	75.00%
70	35.00%	35.00%	100.00%	100.00%
71	35.00%	35.00%	100.00%	100.00%
72	35.00%	35.00%	100.00%	100.00%
73	35.00%	35.00%	100.00%	100.00%
74	35.00%	35.00%	100.00%	100.00%
75 and over	100.00%	100.00%	100.00%	100.00%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

The TCERA Board has the authority to select economic and demographic assumptions for the Plan. The assumptions used in the most recent actuarial valuations reflected the results of an Experience Study performed by Cheiron covering the period July 1, 2014 through June 30, 2017.

1. Rate of Return

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

2. Inflation

The Consumer Price Index (CPI) is assumed to increase at the rate of 3.00% per year.

3. Post Retirement COLA

Benefits are assumed to increase after retirement at the rate of 2.7% per year for Tier 1 and 2% per year for Tiers 2-4.

4. Internal Revenue Code Limits and PEPRA Pensionable Compensation Limits

The maximum benefit and maximum compensation limitations under Internal Revenue Code Sections 415 and 401(a)(17), respectively, are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement. The PEPRA compensation limit, which was \$124,180 for calendar year 2019 for members participating in Social Security, was applied.

5. Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 7.25%.

6. Family Composition

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

Division	Gender	Percentage
General	Males	85%
General	Female	65%
Safety	Male	90%
Safety	Female	70%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

7. Increases in Pay

Wage inflation component: 3.00% (this assumption is also used to project the compensation limit for PEPRAs members)

Additional longevity and promotion component:

Longevity and Promotion Increases		
Service	General	Safety
0	8.00%	8.00%
1	6.50%	6.00%
2	5.50%	5.00%
3	4.00%	4.50%
4	3.00%	4.25%
5	2.00%	4.00%
6	1.75%	3.00%
7	1.50%	2.50%
8	1.00%	2.00%
9	1.00%	1.75%
10	1.00%	1.50%
11	1.00%	1.00%
12	1.00%	0.50%
13	1.00%	0.50%
14	1.00%	0.50%
15	1.00%	0.50%
16	1.00%	0.50%
17	1.00%	0.50%
18	1.00%	0.50%
19	1.00%	0.50%
20	1.00%	0.50%
21	1.00%	0.50%
22	1.00%	0.50%
23	1.00%	0.50%
24	1.00%	0.50%
25+	0.50%	0.50%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

8. Termination

Age	Rates of Termination					
	General			Safety		
	Years of Service			Years of Service		
	Less than 3	3 to 5	5 or more	Less than 3	3 to 5	5 or more
20	15.00%	12.00%	10.00%	12.00%	7.00%	6.00%
21	15.00%	12.00%	10.00%	12.00%	7.00%	6.00%
22	15.00%	12.00%	10.00%	12.00%	7.00%	6.00%
23	15.00%	12.00%	10.00%	12.00%	7.00%	6.00%
24	15.00%	12.00%	10.00%	12.00%	7.00%	6.00%
25	15.00%	8.00%	8.00%	12.00%	7.00%	6.00%
26	15.00%	8.00%	8.00%	12.00%	7.00%	6.00%
27	15.00%	8.00%	8.00%	12.00%	7.00%	6.00%
28	15.00%	8.00%	8.00%	12.00%	7.00%	6.00%
29	15.00%	8.00%	8.00%	12.00%	7.00%	6.00%
30	15.00%	8.00%	6.00%	12.00%	7.00%	4.50%
31	15.00%	8.00%	6.00%	12.00%	7.00%	4.50%
32	15.00%	8.00%	6.00%	12.00%	7.00%	4.50%
33	15.00%	8.00%	6.00%	12.00%	7.00%	4.50%
34	15.00%	8.00%	6.00%	12.00%	7.00%	4.50%
35	15.00%	8.00%	5.00%	12.00%	7.00%	4.00%
36	15.00%	8.00%	5.00%	12.00%	7.00%	4.00%
37	15.00%	8.00%	5.00%	12.00%	7.00%	4.00%
38	15.00%	8.00%	5.00%	12.00%	7.00%	4.00%
39	15.00%	8.00%	5.00%	12.00%	7.00%	4.00%
40	14.25%	8.00%	5.00%	12.00%	7.00%	4.00%
41	14.25%	8.00%	5.00%	12.00%	7.00%	4.00%
42	14.25%	8.00%	5.00%	12.00%	7.00%	4.00%
43	14.25%	8.00%	5.00%	12.00%	7.00%	4.00%
44	14.25%	8.00%	5.00%	12.00%	7.00%	4.00%
45	13.50%	8.00%	5.00%	10.00%	6.00%	3.50%
46	13.50%	8.00%	5.00%	10.00%	6.00%	3.50%
47	13.50%	8.00%	5.00%	10.00%	6.00%	3.50%
48	13.50%	8.00%	5.00%	10.00%	6.00%	3.50%
49	13.50%	8.00%	5.00%	10.00%	6.00%	3.50%
50	12.75%	5.00%	5.00%	10.00%	6.00%	0.00%
51	12.75%	5.00%	5.00%	10.00%	6.00%	0.00%
52	12.75%	5.00%	5.00%	10.00%	6.00%	0.00%
53	12.75%	5.00%	5.00%	10.00%	6.00%	0.00%
54	12.75%	5.00%	5.00%	10.00%	6.00%	0.00%
55	12.00%	5.00%	5.00%	5.00%	6.00%	0.00%
56	12.00%	5.00%	5.00%	5.00%	6.00%	0.00%
57	12.00%	5.00%	5.00%	5.00%	6.00%	0.00%
58	12.00%	5.00%	5.00%	5.00%	6.00%	0.00%
59	12.00%	5.00%	5.00%	5.00%	6.00%	0.00%
60	11.25%	5.00%	5.00%	0.00%	0.00%	0.00%
61	11.25%	5.00%	5.00%	0.00%	0.00%	0.00%
62	11.25%	5.00%	5.00%	0.00%	0.00%	0.00%
63	11.25%	5.00%	5.00%	0.00%	0.00%	0.00%
64	11.25%	5.00%	5.00%	0.00%	0.00%	0.00%
65 and over	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

Rates of termination apply to active Members who terminate their employment. Rates are assumed not to apply after eligibility for retirement.

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

General Members: Age 60

Safety Members: Age 53

9. Rates of Deferred Vested Termination

Rates of deferred vested termination are a percentage of the termination rates shown on the previous page.

Service	General Males	General Females	Safety
5-10	75%	50%	60%
10-20	85%	65%	60%
20+	85%	65%	100%

10. Reciprocal Transfers

65% of deferred vested terminated 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 5.00%.

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

11. Rates of Disability

Age	Rates of Disability					
	General - Males		General - Females		Safety	
	Ordinary	Duty	Ordinary	Duty	Ordinary	Duty
20	0.000%	0.010%	0.000%	0.010%	0.000%	0.110%
21	0.000%	0.010%	0.000%	0.010%	0.000%	0.120%
22	0.000%	0.010%	0.000%	0.010%	0.000%	0.130%
23	0.000%	0.010%	0.000%	0.010%	0.000%	0.140%
24	0.000%	0.010%	0.000%	0.010%	0.000%	0.150%
25	0.010%	0.010%	0.010%	0.010%	0.050%	0.170%
26	0.010%	0.010%	0.010%	0.010%	0.050%	0.200%
27	0.010%	0.010%	0.010%	0.010%	0.050%	0.250%
28	0.010%	0.010%	0.010%	0.010%	0.050%	0.300%
29	0.010%	0.010%	0.010%	0.010%	0.050%	0.350%
30	0.010%	0.010%	0.010%	0.010%	0.050%	0.400%
31	0.010%	0.010%	0.010%	0.010%	0.050%	0.450%
32	0.010%	0.010%	0.010%	0.010%	0.050%	0.500%
33	0.010%	0.010%	0.010%	0.010%	0.050%	0.520%
34	0.010%	0.010%	0.010%	0.010%	0.050%	0.540%
35	0.020%	0.020%	0.008%	0.010%	0.050%	0.560%
36	0.020%	0.020%	0.008%	0.010%	0.050%	0.580%
37	0.020%	0.020%	0.008%	0.010%	0.050%	0.600%
38	0.030%	0.030%	0.120%	0.010%	0.050%	0.620%
39	0.030%	0.030%	0.130%	0.010%	0.050%	0.640%
40	0.030%	0.030%	0.140%	0.010%	0.075%	0.660%
41	0.040%	0.045%	0.160%	0.010%	0.075%	0.670%
42	0.040%	0.045%	0.170%	0.010%	0.080%	0.680%
43	0.040%	0.045%	0.180%	0.010%	0.085%	0.690%
44	0.050%	0.050%	0.190%	0.010%	0.090%	0.700%
45	0.050%	0.055%	0.200%	0.010%	0.095%	0.750%
46	0.050%	0.060%	0.220%	0.010%	0.100%	0.800%
47	0.060%	0.070%	0.240%	0.010%	0.150%	0.850%
48	0.070%	0.080%	0.260%	0.010%	0.200%	0.900%
49	0.080%	0.090%	0.280%	0.010%	0.250%	0.950%
50	0.090%	0.100%	0.300%	0.020%	0.300%	1.000%
51	0.100%	0.150%	0.320%	0.020%	0.350%	1.250%
52	0.120%	0.200%	0.340%	0.030%	0.400%	1.500%
53	0.140%	0.250%	0.360%	0.030%	0.450%	1.750%
54	0.160%	0.300%	0.380%	0.040%	0.500%	2.000%
55	0.180%	0.350%	0.400%	0.040%	0.550%	2.250%
56	0.200%	0.400%	0.420%	0.050%	0.600%	2.300%
57	0.220%	0.450%	0.440%	0.050%	0.650%	2.350%
58	0.240%	0.500%	0.480%	0.060%	0.700%	2.400%
59	0.260%	0.550%	0.520%	0.060%	0.750%	2.450%
60	0.280%	0.600%	0.540%	0.070%	0.000%	0.000%
61	0.300%	0.650%	0.560%	0.070%	0.000%	0.000%
62	0.320%	0.700%	0.600%	0.080%	0.000%	0.000%
63	0.340%	0.750%	0.620%	0.080%	0.000%	0.000%
64	0.360%	0.800%	0.640%	0.080%	0.000%	0.000%
65 and over	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

12. Rates of Mortality for Healthy Lives

Mortality rates for General actives, retirees, beneficiaries, terminated vested, and reciprocals are based on the sex distinct Retired Pensioner (RP) 2014 Combined Healthy Tables, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2016, and increased by 12.1% for males and 8.0% for females to reflect Plan experience.

Mortality rates for Safety actives, retirees, beneficiaries, terminated vested, and reciprocals are based on the sex distinct Retired Pensioner (RP) 2014 Combined Healthy Tables with blue-collar adjustment, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2016, and increased by 4.5% for males to reflect Plan experience.

13. Rates of Mortality for Retired Disabled Lives

Mortality rates for disabled retirees are based on the sex distinct Retired Pensioner (RP) 2014 Generational Disabled Annuitant Mortality Table, published by the Society of Actuaries, with Generational improvement using Projection Scale MP-2016.

14. Duty-Related Deaths (Safety Employees Only)

Percentage of deaths assumed to be duty related	
Age	
20-24	37%
25-30	42%
31-34	45%
35-43	50%
44-45	52%
46-47	54%
48-49	56%
50-54	58%
55-56	60%
57-58	62%
59	63%

**TULARE COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
EXPERIENCE STUDY AS OF JUNE 30, 2020**

APPENDIX B – SUMMARY OF PRIOR ASSUMPTIONS

15. Rates of Retirement

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

Age	General Years of Service		Safety Years of Service	
	Less than 30	30 or more	Less than 20	20 or more
45	0.00%	0.00%	7.00%	7.00%
46	0.00%	0.00%	7.00%	7.00%
47	0.00%	0.00%	7.00%	7.00%
48	0.00%	0.00%	7.00%	7.00%
49	0.00%	0.00%	7.00%	7.00%
50	5.00%	10.00%	7.00%	7.00%
51	5.00%	10.00%	7.00%	7.00%
52	5.00%	10.00%	7.00%	7.00%
53	5.00%	10.00%	7.00%	7.00%
54	5.00%	10.00%	7.00%	7.00%
55	6.00%	10.00%	7.00%	18.00%
56	6.00%	10.00%	7.00%	18.00%
57	6.00%	10.00%	7.00%	18.00%
58	6.00%	10.00%	7.00%	18.00%
59	6.00%	10.00%	7.00%	18.00%
60	15.00%	20.00%	20.00%	40.00%
61	15.00%	20.00%	20.00%	40.00%
62	15.00%	20.00%	20.00%	40.00%
63	15.00%	20.00%	20.00%	40.00%
64	15.00%	20.00%	20.00%	40.00%
65	35.00%	35.00%	20.00%	75.00%
66	35.00%	35.00%	20.00%	75.00%
67	35.00%	35.00%	20.00%	75.00%
68	35.00%	35.00%	20.00%	75.00%
69	35.00%	35.00%	20.00%	75.00%
70	35.00%	35.00%	100.00%	100.00%
71	35.00%	35.00%	100.00%	100.00%
72	35.00%	35.00%	100.00%	100.00%
73	35.00%	35.00%	100.00%	100.00%
74	35.00%	35.00%	100.00%	100.00%
75 and over	100.00%	100.00%	100.00%	100.00%



Classic Values, Innovative Advice