Mendocino County Employees' Retirement Association

ACTUARIAL EXPERIENCE STUDY

Analysis of Actuarial Experience
During the Period
July 1, 2011 through June 30, 2014

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October 7, 2014

Board of Retirement
Mendocino County Employees' Retirement Association
625-B Kings Court
Ukiah, CA 95482-5027

Re: Review of Actuarial Assumptions for the June 30, 2014 Actuarial Valuation

Dear Members of the Board:

We are pleased to submit this report of our review of the actuarial experience of the Mendocino County Employees' Retirement Association. This study utilizes the census data for the three-year period from July 1, 2011 through June 30, 2014 and includes the proposed actuarial assumptions, both demographic and economic, to be used in the June 30, 2014 and later actuarial valuations.

We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

We look forward to reviewing this report with you and answering any questions you may have.

Sincerely,

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Senior Vice President and Actuary

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TABLE OF CONTENTS

Page

I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS 1

II. BACKGROUND AND METHODOLOGY 6

III. ECONOMIC ASSUMPTIONS 8

A. INFLATION 8

B. INVESTMENT RETURN 10

C. SALARY INCREASE 25

IV. DEMOGRAPHIC ASSUMPTIONS 29

A. RETIREMENT RATES 29

B. MORTALITY RATES - HEALTHY 35

C. MORTALITY RATES - DISABLED 41

D. TERMINATION RATES 47

E. DISABILITY INCIDENCE RATES 55

F. SICK LEAVE 60

G. VACATION CASH OUTS 61

APPENDIX A CURRENT ACTUARIAL ASSUMPTIONS 62

APPENDIX B PROPOSED ACTUARIAL ASSUMPTIONS 67

I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS

To project the cost and liabilities of the Pension Fund, assumptions are made about all future events that could affect the amount and timing of the benefits to be paid and the assets to be accumulated. Each year actual experience is compared against the projected experience, and to the extent there are differences, the future contribution requirement is adjusted.

If assumptions are changed, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Taking into account one year's gains or losses without making a change in the assumptions in effect assumes that experience was temporary and that, over the long run, experience will return to what was originally assumed. Changing assumptions reflects a basic change in thinking about the future, and it has a much greater effect on the current contribution requirements than recognizing gains or losses as they occur.

The use of realistic actuarial assumptions is important in maintaining adequate funding, while paying promised benefit amounts to participants already retired and to those near retirement. The actuarial assumptions used do not determine the "actual cost" of the plan. The actual cost is determined solely by the benefits and administrative expenses paid out, offset by investment income received. However, it is desirable to estimate as closely as possible what the actual cost will be so as to permit an orderly method for setting aside contributions today to provide benefits in the future, and to maintain equity among generations of participants and taxpayers.

This study was undertaken in order to compare the actual experience during one three year experience period with that expected under the current assumptions. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27,[1] "Selection of Economic Assumptions for Measuring Pension Obligations" and ASOP No. 35, "Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations". These Standards of Practice put forth guidelines for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected near-term experience, we are recommending various changes in the current actuarial assumptions.

We are recommending changes in the assumptions for: inflation, investment return, retirement from active employment, percentage married at retirement, pre-retirement mortality, healthy life mortality, disabled life mortality, termination from active employment, and disability incidence.

Our recommendations for the major actuarial assumption categories are as follows:

Inflation – Future increases in the cost-of-living index which drives investment returns and active member salary increases, as well as COLA increases to retired employees.

Recommendation: Reduce the rate from 3.50% to 3.25% per annum.

Investment Return – The estimated average net rate of return on current and future assets of the Association as of the valuation date. This rate is used to discount liabilities.

Recommendation:

If (as we recommend) the Board wishes to develop a single investment return assumption for both funding and financial reporting purposes, we would recommend reducing the investment return assumption to 7.50%, but only if it is developed net only of investment expenses (i.e., gross of administrative expenses). (This is referred to as "Option A" in this report.) This option would require an additional explicit administrative expense loading of 1.5% of payroll.

If the Board does not wish to charge an explicit amount for the administrative expenses, then we would recommend reducing the investment return assumption to 7.25%. (This is referred to as "Option B" in this report.)

[1] ASOP No. 27 was revised in September 2013 effective for measurement dates on or after September 30, 2014. Because, absent subsequent Board action, the recommendations developed herein are intended for use in the June 30, 2014, 2015 and 2016 valuations, this study was performed in accordance with ASOP 27 as constituted both before and after the 2013 revisions to the ASOP.

Individual Salary Increases – Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components:

- Inflationary salary increases.
- Real across the board salary increases.
- Promotional and merit increases.

Recommendation: Reduce the current inflationary salary increase assumption from 3.50% to 3.25% per annum, consistent with our recommended general inflation assumption, and maintain the real "across the board" salary increase assumption of 0.50%. This means that the combined inflationary and real "across the board" salary increases will decrease from 4.00% to 3.75% per annum. Maintain the current merit and promotional increases until more reliable data is available for setting that assumption.

Retirement Rates – The probability of retirement at each age at which participants are eligible to retire.

Recommendation: For active members, adjust the current retirement rates to those developed in Section (IV)(A). Overall, the recommended assumptions will anticipate (1) later retirements for active members in General Tiers 1, 2, and 3 and Safety members in Tiers 1 and 2, and (2) earlier retirements for active members in Probation Tiers 1 and 2. No adjustments have been made to the General Tier 4, Safety Tier 3, or Probation Tier 3 rates because no data is available for those tiers.

For active and inactive vested members, reduce the percent married at retirement assumption from 80% to 75% for males and maintain the assumption at 50% for females. Maintain the assumption that female spouses are 3 years younger than their male spouses. For inactive vested members, maintain the assumed retirement age at 60 for General members and at 55 for Safety and Probation members.

Maintain the current assumptions for reciprocity and percentage of terminated members assumed to choose a refund of contributions or a deferred vested benefit.

Mortality Rates – The probability of dying at each age. Mortality rates are used to project life expectancies.

Recommendation: For healthy pensioners and all beneficiaries, change from the current RP-2000 Combined Healthy Mortality Tables for Males and Females, with a 2-year setback for General males (and all male beneficiaries), a 1-year setback for General females (and all female beneficiaries), no setback for Safety and Probation males, and a 1-year set forward for Safety and Probation females, to the RP-2000 Combined Healthy Mortality Tables for Males and Females, projected with Scale BB to 2020, with a 1-year setback for all healthy male members and all male beneficiaries, and with no

setback for all healthy female members and all female beneficiaries. Under the recommended mortality assumptions, we are no longer making a distinction in expected mortality experience among General, Safety, and Probation members, to recognize the relatively small Safety and Probation retiree population.

For disabled pensioners, change from the current RP-2000 Combined Healthy Mortality Tables for Males and Females, with a 2-year set forward for General members and a 4-year set forward for Safety and Probation members, to the RP-2000 Combined Healthy Mortality Tables for Males and Females, projected with Scale BB to 2020, with a 4-year set forward for General, Safety, and Probation members.

For pre-retirement mortality, use the same mortality as for healthy pensioners.

The recommended mortality assumptions will anticipate longer life expectancy both pre- and post-retirement.

Termination Rates – The probability of leaving employment at each age or service category and receiving either a refund of contributions or a deferred vested retirement benefit.

Recommendation: Adjust the current termination rates to those developed in Section (IV)(D). The recommended assumptions will anticipate more terminations.

Disability Incidence Rates – The probability of becoming disabled at each age.

Recommendation: Adjust the current disability rates to those developed in Section (IV)(E). The recommended assumptions will anticipate fewer disability retirements.

Unused Sick Leave – Unused sick leave hours can be converted into service credit at retirement.

Recommendation: Maintain the assumption to anticipate 0.019 years of sick leave conversion at service retirement for each year of employment.

Vacation Cash Outs – Vacation cash outs during employment and final salary averaging period.

Recommendation: Continue to explore with the employer the feasibility of collecting such data to determine whether an assumption should be included in the actuarial valuation to anticipate conversion of relatively higher amounts of vacation cash outs immediately before retirement.

Section II provides some background on basic principles and the methodology used for the experience study. A detailed discussion of the experience and reasons for the proposed changes are found in Section III for the economic assumptions and Section IV for the demographic assumptions.

II. BACKGROUND AND METHODOLOGY

In this report, we analyzed both economic and demographic ("non-economic") assumptions. The primary economic assumptions reviewed are inflation, investment return, and salary increases. Demographic assumptions include the probabilities of certain events occurring in the population of members, referred to as "decrements," e.g., termination from service, disability retirement, service retirement, and death before and after retirement.

Economic Assumptions

Economic assumptions consist of:

Inflation – Increases in the price of goods and services. The inflation assumption reflects the basic return that investors expect from securities markets. It also reflects the expected basic salary increase for active employees and drives increases in the allowances of retired members.

Investment Return – Expected long term rate of return on the Association's investments after expenses. This assumption has a significant impact on contribution rates.

Salary Increases – In addition to inflationary increases, it is assumed that salaries will also grow by "across the board" real pay increases in excess of price inflation. It is also assumed that employees will receive raises above these average increases as they advance in their careers. These are commonly referred to as merit and promotional increases. Payments to amortize any unfunded actuarial accrued liability (UAAL) are assumed to increase each year by the price inflation rate plus any "across the board" pay increases that are assumed.

The setting of these economic assumptions is described in Section III.

Demographic Assumptions

In order to determine the probability of an event occurring, we examine the "decrements" and "exposures" of that event. For example, taking termination from service, we compare the number of employees who actually terminate in a certain age and/or service category (i.e., the number of "decrements") with those who could have terminated (i.e., the number of "exposures"). For example, if there were 500 active employees in the 20-24 age group at the beginning of the year and 50 of them terminate during the year, we would say the probability of termination in that age group is 50 ÷ 500 or 10%.

The reliability of the resulting probability is highly dependent on both the number of decrements and the number of exposures. For example, if there are only a few people in a high age category at the beginning of the year (number of exposures), we would not lend as much credibility to the probability of termination developed for that age category, especially if it is out of line with the pattern shown for the other age groups. Similarly, if we are considering the death decrement, there may be a large number of exposures in, say, the age 20-24 category, but very few decrements (actual deaths); therefore, we would not be able to rely heavily on the probability developed for that category.

One reason we use several years of experience for such a study is to have more exposures and decrements, and therefore more statistical reliability. Another reason for using several years of data is to smooth out fluctuations that may occur from one year to the next. However, we also calculate the rates on a year-to-year basis to check for any trend that may be developing in the later years.

III. ECONOMIC ASSUMPTIONS

A. INFLATION

Unless an investment grows at least as fast as prices increase, investors will experience a reduction in the inflation-adjusted value of their investment. There may be times when "riskless" investments return more or less than inflation, but over the long term, investment market forces will generally require an issuer of fixed income securities to maintain a minimum return which protects investors from inflation.

The inflation assumption is long term in nature, so it is set using primarily historical information. Following is an analysis of 15-year and 30-year moving averages of historical inflation rates:

Historical Consumer Price Index – 1930 to 2013
(U.S. City Average - All Urban Consumers)

	25th Percentile	Median	75th Percentile
15-year moving averages	2.6%	3.4%	4.7%
30-year moving averages	3.2%	4.2%	4.9%

The average inflation rates have continued to decline gradually over the last several years due to the relatively low inflationary period over the past two decades. Also, the later of the 15-year averages during the period are lower as they do not include the high inflation years of the mid-1970s and early 1980s.

In the 2013 public fund survey published by the National Association of State Retirement Administrators, the median inflation assumption used by 126 large public retirement funds in their 2012 valuations has decreased to 3.00% from the 3.25% used in the 2011 valuations. In California, CalPERS and LACERA have recently reduced their inflation assumptions to 2.75% and 3.00%, respectively.

MCERA's investment consultant, Callan, anticipates an annual inflation rate of 2.50%, while the average inflation assumption provided to us by Callan and by eight other investment advisory firms retained by Segal's California public sector clients was 2.52%. Note that, in general, investment consultants use a time horizon for this assumption that is shorter than the time horizon we use for the actuarial valuation.

To find a forecast of inflation based on a longer time horizon, we referred to the 2013 report on the financial status of the Social Security program. The projected average increase in the Consumer Price Index (CPI) over the next 75 years under the intermediate cost assumptions used in that report was 2.80%. We also compared the yields on the thirty-year inflation indexed U.S. Treasury bonds to comparable traditional U.S. Treasury bonds. As of June 2014, the difference in yields is about 2.28%, which provides a measure of market expectations of inflation.

Based on all of the above information, we recommend that the current 3.50% annual inflation assumption be lowered to 3.25% for the June 30, 2014 valuation.

Retiree Cost-of-Living Increases

In our last review of the economic assumptions as of June 30, 2011, consistent with the 3.00% maximum cost-of-living benefit provision adopted by the employer, the Board adopted a 3.00% retiree cost-of-living adjustment (COLA) for retirees in General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2. (Note that no COLAs are provided for members in General Tier 4, Safety Tier 3, and Probation Tier 3, adopted as a result of the California Public Employees' Pension Reform Act of 2013 (CalPEPRA)).

We are recommending that the same 3.00% cost-of-living assumption be used in the June 30, 2014 valuation for General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2.

Note that in developing the COLA assumption, we also considered the results of a stochastic approach that would attempt to account for the possible impact of low inflation that could occur before COLA banks are able to be established for the member. Although the results of this type of analysis might justify the use of a lower COLA assumption, we are not recommending that at this time. The reasons for this conclusion include the following:

- The results of the stochastic modeling are significantly dependent on assuming that lower levels of inflation will persist in the early years of the projections. If this is not assumed, then the stochastic modeling will produce results similar to our proposed COLA assumption.

- Using a lower long-term COLA assumption based on a stochastic analysis would mean that an actuarial loss would occur even when the inflation assumption of 3.25% is met in a year. We question the reasonableness of this result.

We do not see the stochastic possibility of COLAs averaging less than those predicted by the assumed rate of inflation as a reliable source of cost savings that should be anticipated in our COLA assumption. Therefore, we continue to recommend setting the COLA assumption based on the long-term annual inflation assumption, as we have in prior years.

B. INVESTMENT RETURN

The investment return assumption is comprised of two primary components, inflation and real rate of investment return, with adjustments for expenses and risk.

Real Rate of Investment Return

This component represents the portfolio's incremental investment market returns over inflation. Theory has it that, as an investor takes a greater investment risk, the return on the investment is expected to also be greater, at least in the long run. This additional return is expected to vary by asset class and empirical data supports that expectation. For that reason, the real rate of return assumptions are developed by asset class. Therefore, the real rate of return assumption for a retirement system's portfolio will vary with the Board's asset allocation among asset classes.

The following is the Association's current target asset allocation and assumed real rate of return assumptions by asset class. The first column of real rate of return assumptions are determined by reducing Callan's total return assumptions by their assumed 2.50% inflation rate. The second column of returns represents the average of a sample of real rate of return expectations. The sample includes the expected annual real rate of returns provided to us by Callan and by eight other investment advisory firms retained by Segal's California public retirement system clients. We believe these averages are a reasonable forecast of long-term future real market returns.[2]

[2] Note that, just as for the inflation assumption, in general the time horizon used by the investment consultants in determining the real rate of return assumption is shorter than the time horizon encompassed by the actuarial valuation.

MCERA's Target Asset Allocation and
Assumed Arithmetic Real Rate of Return Assumptions by Asset Class and for the Portfolio

Asset Class	Percentage of Portfolio	Callan's Assumed Real Rates of Return[1]	Average Real Rate of Return from a Sample of Consultants to Segal's Public Clients[2]
U.S. Large Cap Equity	26.2%	6.40%	5.86%
U.S. Small Cap Equity	11.8%	7.65%	6.56%
Global Equity	25.0%	7.30%	6.85%
Domestic Fixed Income	28.0%	0.05%	0.71%
Real Estate	9.0%	5.05%	4.76%
Total	100.0%	4.87%	4.65%

(1) Derived by reducing Callan's total rate of return assumptions by their 2.50% inflation rate.

(2) These are based on the projected arithmetic returns provided by the investment advisory firms serving the county retirement systems of Mendocino, Alameda, Contra Costa, Kern, Orange and Sonoma, the Los Angeles City Employees' Retirement Association, the Los Angeles Fire and Police Pensions, and the East Bay Municipal Utility District Retirement System. These returns are gross of any applicable investment expenses.

Please note that the above are representative of "indexed" returns and do not include any additional returns ("alpha") from active management. This is consistent with the prior Actuarial Standard of Practice (ASOP) No. 27, Section 3.6.3.e, which states:

> "Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (pessimistic). Few investment managers consistently achieve significant above-market returns net of expenses over long periods."

In the revised ASOP issued in September 2013 (which applies to actuarial work product with a measurement date on or after September 30, 2014) , Section 3.8.3.d contains the relevant guidance:

> "Investment Manager Performance—Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period."

The following are some observations about the returns provided above:

1. The investment consultants to our California public clients have each provided us with their expected real rates of return for each asset class, over various future periods of time. However, in general, the returns available from investment consultants are projected over time periods shorter than the duration of a retirement plan's liabilities.

2. Using an average of expected real rate of returns allows the Association's investment return assumption to include a broader range of capital market information and should help reduce year-to-year volatility in the Association's investment return assumption.

3. Therefore, we recommend that the 4.65% portfolio real rate of return be used to determine the Association's investment return assumption. This is 0.22% lower than the real rate of return that was used three years ago to prepare the recommended investment return assumption for the June 30, 2011 valuation. This decrease is primarily caused by the less optimistic capital market assumptions provided by the investment consultants for certain asset classes.

Association Expenses

For funding purposes, the real rate of return assumption for the portfolio needs to be adjusted for investment expenses expected to be paid from investment income. As further discussed later in this repot, current practice for MCERA also adjusts for expected administrative expenses.

Based on information provided by the Association, we have shown in the following table the expenses in relation to the market value of assets for the last seven years ending June 30, 2013.

Administrative and Investment Expenses as a Percentage of Market Value of Assets

Year Ending June 30	Market Value of Assets at Beginning of Plan Year	Investment Expenses	Administrative Expenses	Investment %	Administrative %	Total %
2007	$307,330,102	$337,677	$415,588	0.11%	0.14%	0.25%
2008	354,172,127	306,647	426,194	0.09%	0.12%	0.21%
2009	331,352,717	436,606	601,879	0.13%	0.18%	0.31%
2010	272,040,910	595,494	644,865	0.22%	0.24%	0.46%
Four-year average as of June 30, 2010						0.31%*
2011	300,042,562	404,760	639,764	0.13%	0.21%	0.34%
2012	355,042,523	316,274	698,463	0.09%	0.20%	0.29%
2013	342,736,812	632,406	829,999	0.18%	0.24%	0.42%
Three-year average as of June 30, 2013, used in setting this assumption in the June 30, 2014 experience study				0.13%	0.22%	0.35%
Recommendation				**0.15%**	**0.20%**	**0.35%**

* Based on this experience, a 0.30% expense component was used in developing this assumption in the June 30, 2011 experience study.

Based on this experience, we recommend that the Association's future expense component of the investment return assumption be increased from 0.30% to 0.35%.

Note related to investment expenses paid to active managers – As cited above in Section 3.8.3.d. of the 2014 revision to ASOP No. 27, the effect of an active investment management strategy should be considered "net of investment expenses". For MCERA, all of the $0.6 million in investment expenses paid in fiscal year 2012/2013 was for expenses paid to active managers. Based on information provided by MCERA, we understand that a comparison on a prospective basis of active management expenses to any additional returns ("alpha") earned by that active management is not available. Even if this information were available, we do not believe that such review would necessarily have a significant impact on the recommended investment return assumption developed using the above expense assumption. This is because any alpha that may be identified could be used to increase the confidence level of achieving the recommended investment return assumption. For example, an alpha of 0.20% would increase the confidence level by about 2% (see discussions that follow for definitions of risk adjustment and confidence level), which would bring the confidence level associated with the recommended 7.50% investment return assumption somewhat closer to that associated with the current 7.75% investment return assumption developed in the previous study.

Adjustment to Exclude Administrative Expenses in Developing Investment Return Assumption for use in GASB Financial Reporting

In 2012, GASB adopted Statements 67 and 68 that replace Statements 25 and 27 for financial reporting purposes. GASB Statements 67 and 68 are effective for plan year ending June 30, 2014 for the Retirement Association and fiscal year ending June 30, 2015 for the employer.[3]

According to GASB, the investment return assumption for use in financial reporting purposes should be based on the long-term expected rate of return on a retirement system's investments and should be net of investment expenses but not of administrative expenses (i.e., without reduction for administrative expenses). As can be observed from the above development of the expense assumption, if the Board wishes to develop a single investment return assumption for both funding and financial reporting purposes, then it would be necessary to exclude the roughly 0.20% administrative expense component from the above development and to develop a separate treatment of administrative expenses.

The issues associated with eliminating the consideration of administrative expenses when developing the investment return assumption used for funding, and the alternatives that may be available to the Board in

[3] The new Statements (67 and 68) will require more rapid recognition for investment gains or losses and much shorter amortization for actuarial gains or losses. Because of the more rapid recognition of those changes, retirement systems that have generally utilized the previous Statements (25 and 27) as a guideline to establish the employer's contribution amounts for both funding and financial reporting purposes would now have to prepare two sets of cost results, one for contributions and one for financial reporting under the new Statements.

developing the investment return assumption for use in GASB financial reporting purposes are provided at the end of this Section. While we do recommend that the Board adopt an investment return for funding that is gross of administrative expenses, the preliminary discussion that follows has first been completed on a net of administrative expenses basis, to allow an "apples to apples" comparison with the current assumption.

Risk Adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. The Association's asset allocation also determines this portfolio risk, since risk levels are driven by the variability of returns for the various asset classes and the correlation of returns among those asset classes. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment.

The purpose of the risk adjustment (as measured by the corresponding confidence level) is to increase the likelihood of achieving the actuarial investment return assumption in the long term.[4] The 4.65% expected real rate of return developed earlier in this report was based on expected mean or average arithmetic returns. This means there is a 50% chance of the actual return in each year being at least as great as the average (assuming a symmetrical distribution of future returns). The risk adjustment is intended to increase that probability. This is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

Three years ago, the Board adopted an investment return assumption of 7.75%. In combination with the inflation, real return, and expense components from three years ago, that return implied a risk adjustment of 0.32% reflecting a confidence level of 54% that the actual return over 15 years would not fall below the assumed return, assuming that the distribution of returns over that period follows the normal statistical distribution.[5]

In our model, the confidence level associated with a particular risk adjustment represents the likelihood that the actual average return would equal or exceed the assumed value over a 15-year period. For example, if we set our real rate of return assumption using a risk adjustment that produces a confidence level of 60%, then we would expect a 60% chance (6 out of 10) that the average return over 15 years will be equal to or greater than the assumed value. The 15-year time horizon represents an approximation of

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[4] This type of risk adjustment is referred to in ASOP No. 27 as a "margin for adverse deviation."

[5] Based on an annual portfolio standard deviation of 12.83% provided by Callan three years ago. Strictly speaking, future compound long-term investment returns will tend to follow a log-normal distribution. However, we believe the normal distribution assumption is reasonable for purposes of setting this type of risk adjustment.

the "duration" of the fund's liabilities, where the duration of a liability represents the sensitivity of that liability to interest rate variations.

If we use the same 54% confidence level to set this year's risk adjustment, based on the current long-term portfolio standard deviation of 13.38% provided by Callan, the result is a risk adjustment of 0.33%. Together with the other investment return components, this produces a net investment return assumption of 7.22%, which is substantially lower than the current assumption of 7.75%.

Because this would be a substantial change in this long-term assumption, we evaluated the effect on the confidence level of alternative investment return assumptions. In particular, a net investment return assumption of 7.50%, together with the other investment return components, would produce a risk adjustment of 0.05%, which corresponds to a confidence level of 51%. Alternatively, a net investment return assumption of 7.25%, together with the other investment return components, would produce a risk adjustment of 0.30%, which corresponds to a confidence level of 53%.

The risk adjustment model and associated confidence level is most useful as a means for comparing how the Association has positioned itself with respect to risk over periods of time[6]. The use of a 51% or 53% confidence level (corresponding to an investment return of 7.50% or 7.25%, respectively) should be considered in context with other factors, including:

1. As noted above, the confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparisons.

2. The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by Callan. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a "soft" number.

3. A lower level of inflation should reduce the overall risk of failing to meet the investment return assumption. Lowering the confidence level to some extent could be justified as consistent with the change in the inflation assumption.

4. As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. One measure of reasonableness is discussed in the following

[6] In particular, it would not be appropriate to use this type of risk adjustment as a measure of determining an investment return rate that is "risk-free."

section that presents a comparison with assumptions adopted by similarly situated public sector retirement sections.

5. A confidence level of 51% (which is associated with a 7.50% investment return assumption) is at the lower end of the range of about 50% to 60% that corresponds to the risk adjustments used by most of Segal's other California public retirement system clients. Most public retirement systems that have recently reviewed their investment return assumptions have considered adopting more conservative investment return assumptions for their valuations, mainly to maintain the likelihood that future actual market return will meet or exceed the investment return assumption. While this may provide argument for a confidence level greater than 51% (such as the 53% confidence level that is associated with a 7.25% investment return assumption), we would also note that a 0.25% reduction in the investment return assumption is already a significant reduction in a long-term assumption.

Preliminary Recommended Investment Return Assumption

Taking into account the factors above, our preliminary values for consideration by the Board are to reduce the investment return assumption from 7.75% to either 7.50% or 7.25%, net of both investment and administrative expenses. As noted above, these returns imply risk adjustments of 0.05% or 0.30%, reflecting confidence levels of 51% or 53% that the actual average return over 15 years would not fall below the assumed return.

The following table provides the components of the preliminary investment return assumptions developed in this preliminary discussion. For comparison purposes, we have included similar values from the last study.

Assumption Component	June 30, 2014 Preliminary Values	June 30, 2014 Alternative Values	June 30, 2011 Adopted Values
Inflation	3.25%	3.25%	3.50%
Plus Average Real Rate of Return	4.65%	4.65%	4.87%
Minus Expense Adjustment	(0.35)%	(0.35)%	(0.30)%
Minus Risk Adjustment	(0.05)%	(0.30)%	(0.32)%
Total	7.50%	7.25%	7.75%
Confidence Level	51%	53%	54%

Based on this analysis, our preliminary recommendation is that the net investment return assumption could be reduced from 7.75% to either 7.50% or 7.25% per annum. Our final recommendations follows later in this section and reflect the following discussion regarding a change in how expected administrative expenses are handled.

Comparing with Other Public Retirement Systems

One final test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide.

We note that a 7.50% investment return assumption is emerging as the most common assumption among those California public sector retirement systems that have studied this assumption recently. In particular, two of the largest California systems, CalPERS and LACERA, recently adopted a 7.50% earnings assumption. Note that CalPERS uses a lower inflation assumption of 2.75% while LACERA uses an inflation assumption of 3.00%. However, three county employees retirement systems (Orange, Fresno and Contra Costa) have recently adopted a 7.25% earnings assumption; furthermore, two of these county systems use a 3.25% inflation assumption while one system uses a 3.00% inflation assumption.

The following table compares the Association's recommended net investment return assumption against those of the nationwide public retirement systems that participated in the National Association of State Retirement Administrators (NASRA) 2013 Public Fund Survey:

Assumption	MCERA	NASRA 2013 Public Fund Survey		
		Low	Median	High
Net Investment Return	7.50%	6.50%	7.90%	8.50%

The detailed survey results show that of the systems that have an investment return assumption in the range of 7.50% to 7.90%, almost half of those systems have used an assumption of 7.50%. The survey also notes that several plans have reduced their investment return assumption during the last year, and

others are considering doing so. State systems outside of California tend to change their economic assumptions slowly and so may lag behind emerging practices in this area.

Developing an Investment Return Assumption for use in Accounting and Financial Reporting under GASB Statements 67 and 68

The Governmental Accounting Standards Board (GASB) has adopted Statements 67 and 68 that replace Statements 25 and 27 for financial reporting purposes. Below we discuss the issues and policy alternatives available to MCERA in developing its investment return assumption that will allow the Association to maintain consistency in its liability measurements for funding and financial reporting purposes.

Background

GASB Statement 67 governs the Association's financial reporting and is effective for the plan year ending June 30, 2014, while GASB Statement 68 governs the employers' financial reporting and is effective for fiscal year ending June 30, 2015. The new statements specify requirements for measuring both the pension liability and the annual pension expense incurred by the employers. The new GASB requirements are only for financial reporting and do not affect how the Association determines funding requirements for its employers. Nonetheless, it is important to understand how the new financial reporting results will compare with the funding requirement results. That comparison will differ dramatically depending on whether one is considering the two pension liability measures or the annual pension expense/contribution measures:

- When measuring pension liability, GASB will use the same actuarial cost method (Entry Age method) and the same type of discount rate (expected return on assets) as MCERA uses for funding. This means that the GASB "Total Pension Liability" measure for financial reporting will be determined on the same basis as MCERA's "Actuarial Accrued Liability" measure for funding. This is a generally favorable feature of the new GASB rules that should largely preclude the need to explain why MCERA has two different measures of pension liability. We note that the same is true for the "Normal Cost" component of the annual plan cost for both funding and financial reporting.

- When measuring annual pension expense, GASB will require more rapid recognition of investment gains or losses and much shorter amortization of changes in the pension liability (whether due to actuarial gains or losses, actuarial assumption changes or plan amendments). Because of GASB's more rapid recognition of those changes, retirement systems that have generally used the same "annual required contribution" amount for both funding (contributions) and financial reporting

(pension expense) will now have to prepare and disclose two different annual cost results, one for contributions and one for financial reporting under the new GASB Statements.

This situation will facilitate the explanation of why the funding and financial reporting results are different: the liabilities and Normal Costs are generally the same, and the differences in annual costs are due to differences in how changes in liability are recognized. However, there is one other feature in the details of how the liabilities are currently measured that will make even the liability and Normal Cost measures different unless action is taken by MCERA.

Treatment of Expected Administrative Expenses when Measuring Liabilities

As noted above, according to GASB, the discount rate used for financial reporting purposes should be based on the long-term expected rate of return on a retirement system's investments, just as it is for funding. However, GASB requires that this assumption should be net of investment expenses but not net of administrative expenses (i.e., without reduction for administrative expenses). Currently, MCERA's investment return assumption used for the annual funding valuation is developed net of both investment and administrative expenses.

While MCERA could continue to develop its funding investment return assumption net of both investment and administrative expenses, that would mean that the Association would then have two slightly different investment return assumptions, one for funding and one for financial reporting. To avoid this apparent discrepancy, and to maintain the consistency of liability measures described above, we believe that it would be preferable to use the same investment return assumption for both funding and financial reporting purposes. The direct way to achieve this would be to develop the investment return assumption for funding purposes on a basis that is gross of administrative expenses and net of only investment expenses.

To review, using the same assumption for both purposes would be easier for MCERA's stakeholders to understand and should result in being able to report MCERA's Actuarial Accrued Liability (AAL) for funding purposes as the Total Pension Liability (TPL) for financial reporting purposes.

The table below is from page 12 of this report. It contains the information used to develop the expense assumption that was used in our preliminary recommendation for the investment return assumption.

Administrative and Investment Expenses as a Percentage of Market Value of Assets

Year Ending June 30	Market Value of Assets at Beginning of Plan Year	Investment Expenses	Administrative Expenses	Investment %	Administrative %	Total %
2007	$307,330,102	$337,677	$415,588	0.11%	0.14%	0.25%
2008	354,172,127	306,647	426,194	0.09%	0.12%	0.21%
2009	331,352,717	436,606	601,879	0.13%	0.18%	0.31%
2010	272,040,910	595,494	644,865	0.22%	0.24%	0.46%
Four-year average as of June 30, 2010						0.31%*
2011	300,042,562	404,760	639,764	0.13%	0.21%	0.34%
2012	355,042,523	316,274	698,463	0.09%	0.20%	0.29%
2013	342,736,812	632,406	829,999	0.18%	0.24%	0.42%
Four-year average as of June 30, 2013, used in setting this assumption in the June 30, 2014 experience study				0.13%	0.22%	0.35%
Recommendation				**0.15%**	**0.20%**	**0.35%**

* Based on this experience, a 0.30% expense component was used in developing this assumption in the June 30, 2011 experience study.

Development of Investment Return Assumption for Funding on a Gross of Administrative Expenses Basis so the Same Assumption Can Also Be Used for Financial Reporting ("Option A")

If the Board wishes to develop a single investment return assumption for both funding and financial reporting purposes, then it would be necessary to exclude the administrative expense component of 0.20% from the preliminary investment returns developed earlier in this report. In theory, one way to do this would be to increase the investment return assumptions as previously developed by 0.20%. However, this approach would be inconsistent with the established practice of setting economic assumptions in ¼% increments.

We believe that a more straightforward approach would be to consider in particular the investment return assumption of 7.50% as though it was developed net only of investment expenses. This would increase the "risk adjustment" component of the assumption by 0.20% and so would result in an increase in the margin for adverse deviation or "confidence level" associated with this assumption from 51% to 53%. This would bring the confidence level closer to the 54% confidence level measured with the 7.75% assumption at the June 30, 2011 experience study.

Based on that analysis we would recommend the 7.50% investment return assumption but only if it is developed net only of investment expenses (i.e., gross of administrative expenses). Note that under this

approach, the 7.50% investment return assumption would need to be accompanied by an explicit loading for administrative expenses, as summarized in the table below.

Calculation of Net Investment Return Assumption

Assumption Component	June 30, 2014 Preliminary (not Recommended) Values if used only for Funding (Net of Administrative Expenses)	June 30, 2014 Recommended Values for both Funding and Financial Reporting (Gross of Administrative Expenses)
Inflation	3.25%	3.25%
Plus Portfolio Real Rate of Return	4.65%	4.65%
Minus Expense Adjustment	(0.35)%	(0.15)%
Minus Risk Adjustment	(0.05)%	(0.25)%
Total	7.50%	7.50%
Confidence Level	51%	53%
Increase in Combined Employer and Employee Contributions Due to Change in Investment Return Assumption Only[7] (Cost as % of Payroll)	3.0%	3.0%
Increase in Employer and Employee Contributions Due to Explicit Load for Administrative Expenses (Cost as % of Payroll)	Not Applicable	1.5%

There is a complication associated with eliminating the administrative expenses in developing the investment return assumption used for funding that relates to the allocation of administrative expenses between the employers and employees:

1. Even though GASB requires the exclusion of the administrative expenses from the investment return assumption, such expense would continue to accrue for a retirement system. For private sector retirement plans, where the investment return is developed using an approach similar to that required by GASB (i.e., without deducting administrative expenses), contribution requirements are increased explicitly by the anticipated annual administrative expense.

2. Under MCERA's current approach of subtracting the administrative expense in the development of the investment return assumption, such annual administrative expense is funded implicitly by effectively deducting it from future expected investment returns. Since an investment return

[7] This does not measure the contribution rate impact from the changes in the other economic assumptions (e.g., the decrease in the inflation assumption from 3.50% to 3.25%) and the non-economic assumptions (e.g., the improvement in life expectancy).

assumption net of investment and administrative expenses has been used historically to establish both the employer's and the employee's contribution requirements, these administrative expenses have been funded implicitly by both the employer and the employees.

3. A switch from the method described in (2) to the method described in (1) may require a new discussion on how to allocate administrative expenses between employers and employees, including possibly establishing a new method to allocate the anticipated annual administrative expense between them. Under current practice, part of the implicit funding of administrative expenses is in the Normal Cost and so is shared between the employer and the employees. However, the rest of the implicit expense funding is in the (Unfunded) Actuarial Accrued Liability, which is funded by the employers.

4. It will not be straightforward to quantify the current implicit sharing of administrative expenses between employers and employees. This means that reproducing that allocation on an explicit basis will be difficult to develop and to explain. This in turn means that MCERA would need to develop a new basis for sharing the cost of administrative expenses. Alternatively, MCERA could decide to treat administrative expenses as a loading applied only to the employer contribution rates, which is the practice followed by private plans, both single employer and multi-employer.

5. As the Board is aware, legislative changes under AB 340 imposed major modifications to both the level of benefits and the cost-sharing of the funding of those benefits for county employees' retirement systems. Included in such modifications is the requirement (for future hires) to fund the Normal Cost on a 50:50 basis between the employer and the employee. As noted in (3) above, under current practice, part of the implicit funding of administrative expenses is in the Normal Cost and so would be shared between the employer and the employees. This would not necessarily continue when the administrative expense loading is developed separate from the Normal Cost.

If (as we recommend) the Board wishes to develop a single investment return assumption for both funding and financial reporting purposes, it is our recommendation that the Board adopt a change in the funding of administrative expenses from the method described in (2) above with an implicit allocation of administrative expenses to the method described in (1) above with an explicit allocation of administrative expenses.

This would require that a separate, explicit administrative expense load assumption be included in the actuarial valuation. Currently that expense load would be approximately $0.8 million annually, or 1.5% of payroll.

The more significant issues mentioned in (3), (4) and (5) above concern whether or not the costs associated with the administrative expenses should continue to be allocated to both the employers and the employees. Unless the Board wishes to charge administrative expenses only to the employers, we propose a method whereby the costs associated with the explicit assumption for administrative expenses continue to be allocated to both employers and employees. A straightforward way to do that in a manner generally consistent with current practice would be to allocate expenses based on the components of the total contribution rate (before expenses) for employers and employees. These components would be employee Normal Cost contributions, employer Normal Cost contributions and employer UAAL contributions. **Of the total administrative expenses of about $0.8 million or 1.5% of payroll, this would result in about $0.6 million or 1.1% of payroll being allocated to the employers and $0.2 million or 0.4% of payroll being allocated to the employees in the aggregate. These illustrative allocation amounts are based on the 26.28% and 9.62% aggregate contribution rates paid by the employers and the employees, respectively, in the June 30, 2013 valuation.**

Development of Investment Return Assumption on a Net of Administrative Expenses Basis but use that Same Assumption for Financial Reporting ("Option B")

If the Board does not wish to charge an explicit amount for the administrative expenses, then we would recommend the 7.25% investment return assumption as developed above (i.e., net of administrative expenses), with the associated confidence level of 53%. In that case, with regard to the assumption used for financial reporting, there is a possible alternative approach which would be to use that same 7.25% assumption for financial reporting purposes under GASB. In effect, this means that even though the same rate is used, it would be considered net of administrative expenses for funding but gross of administrative expenses for financial disclosures. Note that, in effect, this would result in an increase in the margin for adverse deviation or "confidence level" associated with the use of the recommended 7.25% assumption from 53% when it is used for funding purposes to 56% when it is used for financial disclosure purposes.

The following table summarizes the components of the investment return assumption as recommended for funding (net of administrative expenses) and as proposed for financial disclosure purposes (gross of administrative expenses):

Calculation of Net Investment Return Assumption

Assumption Component	June 30, 2014 Alternative Values if used only for Funding (Net of Administrative Expenses)	June 30, 2014 Recommended Values for Financial Reporting (Gross of Administrative Expenses)
Inflation	3.25%	3.25%
Plus Portfolio Real Rate of Return	4.65%	4.65%
Minus Expense Adjustment	(0.35)%	(0.15)%
Minus Risk Adjustment	(0.30)%	(0.50)%
Total	7.25%	7.25%
Confidence Level	53%	56%
Increase in Combined Employer and Employee Contributions Due to Change in Investment Return Assumption Only[8] (Cost as % of Payroll)	6.0%	6.0%

[8] This does not measure the contribution rate impact from the changes in the other economic assumptions (e.g., the decrease in the inflation assumption from 3.50% to 3.25%) and the non-economic assumptions (e.g., the improvement in life expectancy).

C. SALARY INCREASE

Salary increases impact plan costs in two ways: (i) by increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and (ii) by increasing total active member payroll which in turn generates lower UAAL amortization payments. These two impacts are discussed separately below.

As an employee progresses through his or her career, increases in pay are expected to come from three sources:

1. Inflation – Unless pay grows at least as fast as consumer prices grow, employees will experience a reduction in their standard of living. There may be times when pay increases lag or exceed inflation, but over the long term, labor market forces may require an employer to maintain its employees' standards of living.

   As discussed earlier in this report, we are recommending a reduction in the inflation rate from 3.50% to 3.25% per annum. This inflation component will be used as part of the salary increase assumption.

2. Real "Across the Board" Pay Increases – These increases are typically termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board". The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real "across the board" pay increases have averaged about 0.4% - 0.7% annually during the last ten to twenty years.

   We also referred to the annual report on the financial status of the Social Security program published in May 2013. In that report, real "across the board" pay increases are forecast to be 1.1% per year under intermediate assumptions.

   The real pay increase assumption is generally considered a more "macroeconomic" assumption, that is not necessarily based on individual plan experience. However, we note that for MCERA, the most recent salary increase experience indicates that actual average salary changes were lower than the actual change in CPI for the latest three-year period:

Valuation Date	Actual Average Increase[1]	Actual Change in CPI[2]
June 30, 2008	6.42%	3.84%
June 30, 2009	4.96%	0.02%
June 30, 2010	4.29%	2.61%
June 30, 2011	(1.76)%	1.52%
Four-year average as of June 30, 2011, used in the June 30, 2011 experience study	3.48%	2.00%
June 30, 2012	(6.75)%	2.93%
June 30, 2013	(0.70)%	2.22%
June 30, 2014	(1.83)%	2.58%
Three-year average as of June 30, 2014, used in the June 30, 2014 experience study	(3.09)%	2.58%

(1) Reflects the increase in average salary for members at the beginning of the year versus those at the end of the year. It does not reflect the average salary increases received by members who worked the full year.

(2) Based on the change in the December CPI for the San Francisco-Oakland-San Jose Area compared to the prior year.

We note that beginning with fiscal year 2010/2011, members agreed to a one-time reduction in pay ranging from 2.5% to 12.5%. This reduction in pay is reflected in the figures in the table above.

Even though the actual average salary increase was lower than the average change in the CPI over the three-year period ending June 30, 2014, the actual average observed for the four-year period during the prior review of this assumption (prior to the June 30, 2011 valuation) was significantly higher than the actual CPI. Based on this information, we recommend maintaining the real "across the board" salary increase assumption at 0.50%. This means that the combined inflation and "across the board" salary increase will decrease from 4.00% to 3.75% per annum.

3. Merit and Promotional Increases – As the name implies, these increases come from an employee's career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For MCERA, there are service-specific merit and promotional increases.

   The annual merit and promotional increases are determined by measuring the actual increases received by members over the experience period, net of the inflationary and real "across the board" pay increases. Increases are measured separately for General members and for Safety and Probation members. This is accomplished by:

- Measuring each continuing member's actual salary increase over each year of the experience period;
- Categorizing these increases according to member demographics;
- Removing the wage inflation component from these increases (estimated as the increase in the members' average salary during the year for all members);
- Averaging these annual increases over the three year experience period; and
- Modifying current assumptions to reflect some portion of these measured increases reflective of their "credibility."

We noted in our 2011 experience study report that the Association's prior actuary removed the merit and promotional increase assumptions in the June 30, 2010 valuation and that the lack of merit and promotional increase assumptions was unique among the 1937 Act Counties to which we provide actuarial services (and even among other County Systems not served by Segal). In order to provide a base for developing MCERA's merit and promotional increase assumptions in our 2011 experience study, we compiled information regarding the then current salary increase assumptions adopted by the surrounding 1937 Act Counties to MCERA. To develop the merit and promotional increase assumptions for MCERA in the 2011 experience study, we factored in the experience for the surrounding 1937 Act Counties, MCERA's actual merit and promotional increases that we observed for the period July 1, 2008 through June 30, 2011, and the assumptions used by the Association's prior actuary for the June 30, 2009 valuation.

In developing the merit and promotional increase assumptions in our 2011 report, we noted that MCERA's actual merit and promotional increases reflected actual salary reductions from 2010/2011 that were included in the average inflation plus real across the board increases. The current merit and promotional increase assumptions, developed in the 2011 experience study, are as follows:

Current Merit and Promotional Increases

Years of Service	General Members	Safety and Probation Members
0-1	5.00%	5.00%
1-2	3.75%	3.75%
2-3	3.50%	3.00%
3-4	2.75%	2.25%
4-5	2.25%	1.00%
5+	0.50%	0.50%

We note that the observed merit and promotional increases over the latest three-year experience study period (from July 1, 2011 – June 30, 2014), developed using the same method we used to extract the merit and promotional increases for the prior three-year experience study period from 2008 to 2011, are higher than anticipated by the current assumptions. Rather than actual merit and promotional increases, some of those changes may be caused by the higher than expected number of active terminations over the July 1, 2011 – June 30, 2014 experience study period that are discussed in Section IV.D. of this report, and by the additional actual salary reductions after the 2010/2011 fiscal year. **For these reasons, we recommend that the current merit and promotional increase assumptions be maintained for the June 30, 2014 valuation until more reliable data is available for setting the assumption. The recommended merit and promotional increases range from 5.00% to 0.50% for General members and also from 5.00% to 0.50% for Safety and Probation members.**

Active Member Payroll

Projected active member payrolls are used to develop the UAAL contribution rate. Future values are determined as a product of the number of employees in the workforce and the average pay for all employees. The average pay for all employees increases only by inflation and real across the board pay increases. The promotional and merit increases are not an influence, because this average pay is not specific to an individual.

For the June 30, 2014 valuation, we recommend that the active member payroll increase assumption be reduced from 4.00% to 3.75% annually, consistent with the combined inflation and "across the board" salary increase assumptions.

IV. DEMOGRAPHIC ASSUMPTIONS

A. RETIREMENT RATES

The age at which a member retires will affect both the amount of the benefits that will be paid to that member as well as the period over which funding must take place.

Currently, there are separate retirement rates for members in General Tiers 1, 2, and 3 combined, General Tier 4, Safety Tiers 1 and 2 combined, Safety Tier 3, Probation Tiers 1 and 2 combined, and Probation Tier 3. No adjustments have been made to the rates in the CalPEPRA tiers (i.e., General Tier 4, Safety Tier 3, and Probation Tier 3) since no data is available for these tiers.

For General members in Tiers 1, 2 and 3, the actual rates of retirement compared to the expected rates for the last three years, and the proposed rates, are as follows:

Actual and Expected Rates of Retirement for General Members – Tiers 1, 2, and 3

Rate (%)

Age	Actual Retirements	Current Expected Retirements	Proposed Expected Retirements
50	2.63	5.00	6.00
51	2.70	5.00	6.00
52	4.26	5.00	6.00
53	9.43	5.00	6.00
54	14.04	5.00	6.00
55	8.62	7.00	10.00
56	12.73	7.00	10.00
57	8.16	7.00	10.00
58	14.55	7.00	10.00
59	18.57	7.00	10.00
60	12.70	10.00	12.00
61	21.31	15.00	20.00
62	36.00	20.00	26.00
63	20.51	15.00	20.00
64	27.50	15.00	20.00
65	44.12	38.00	45.00
66	65.00	38.00	45.00
67	71.43	38.00	45.00
68	33.33	38.00	45.00
69	50.00	38.00	45.00
70 and over	22.22	100.00	100.00

For Safety members in Tiers 1 and 2, the actual rates of retirement compared to the expected rates for the last three years, and the proposed rates, are as follows:

Actual and Expected Rates of Retirement for Safety Members – Tiers 1 and 2

Rate (%)

Age	Actual Retirements	Current Expected Retirements	Proposed Expected Retirements
50	0.00	5.00	8.00
51	18.18	5.00	8.00
52	14.29	5.00	8.00
53	50.00	5.00	8.00
54	0.00	5.00	8.00
55	0.00	6.31	9.00
56	0.00	7.50	9.00
57	0.00	10.00	10.00
58	33.33	12.50	20.00
59	0.00	37.50	30.00
60 and over	7.14	100.00	100.00

For Probation members in Tiers 1 and 2, the actual rates of retirement compared to the expected rates for the last three years, and the proposed rates, are as follows:

Actual and Expected Rates of Retirement for Probation Members – Tiers 1 and 2

Rate (%)

Age	Actual Retirements	Current Expected Retirements	Proposed Expected Retirements
50	0.00	5.00	5.00
51	0.00	5.00	5.00
52	0.00	5.00	5.00
53	0.00	5.00	5.00
54	25.00	5.00	5.00
55	0.00	28.00	24.00
56	0.00	28.00	24.00
57	100.00	28.00	24.00
58	0.00	28.00	24.00
59	0.00	28.00	24.00
60 and over	33.33	100.00	100.00

Chart 1 compares actual experience with the current and proposed rates of retirement for General members in Tiers 1, 2 and 3. Chart 2 displays the same data for Safety members in Tiers 1 and 2, and Chart 3 is for Probation members in Tiers 1 and 2.

In prior valuations, inactive vested members were assumed to retire at age 60 for General members and age 55 for Safety and Probation members. The average age at retirement over the prior three year period was about 58.5 for General members and about age 55.9 for Safety and Probation members. We recommend maintaining the assumed retirement ages of 60 for General inactive vested participants and 55 for Safety and Probation inactive vested participants.

Currently, 60% of members who terminate and are entitled to a deferred vested benefit are assumed to establish reciprocity with another employer. As of June 30, 2014, the proportion of inactive vested members entitled to future benefits who are working for a reciprocal employer was observed to be about 65%. Based on this experience, we recommend maintaining the reciprocity assumption of 60% for the June 30, 2014 valuation.

In prior retirement plan valuations, it was assumed that 80% of all active and inactive vested male members and 50% of all active and inactive vested female members would be married or have a domestic partner eligible for the 60% automatic retirement continuance benefit when they retired. According to the experience of members who retired during the last three years, about 76% of all male members and 57% of all female members were married at retirement (the results from the prior experience study were 67% and 49% for males and females, respectively). Based on all of this experience, we recommend lowering the current marriage assumption from 80% for male members to 75%, and maintaining the current marriage assumption of 50% for females.

Observed experience for members who retired during the last three years indicates that female spouses were about 1.5 years younger than their male-member spouses on average, and male spouses were about 2.0 years older than their female-member spouses, on average. Based on this data, we recommend maintaining the assumption that female spouses are three years younger than their male spouses. Spouses are assumed to be of the opposite sex to the member.

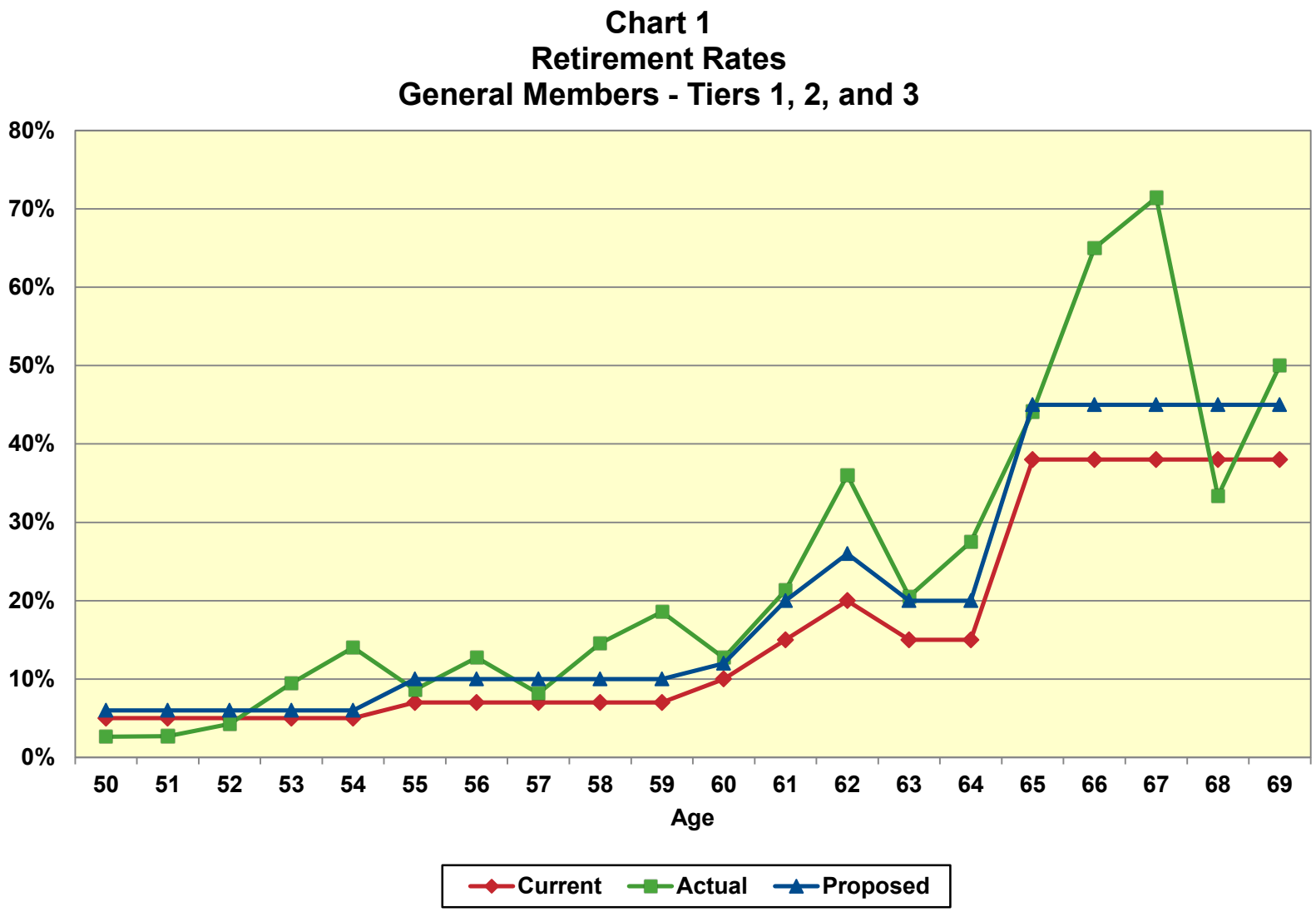
Chart 1
Retirement Rates
General Members - Tiers 1, 2, and 3
80%
70%
60%
50%
40%
30%
20%
10%
0%
50
51
52
53
54
55
56
57
58
59
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68
69
Age
Current
Actual
Proposed

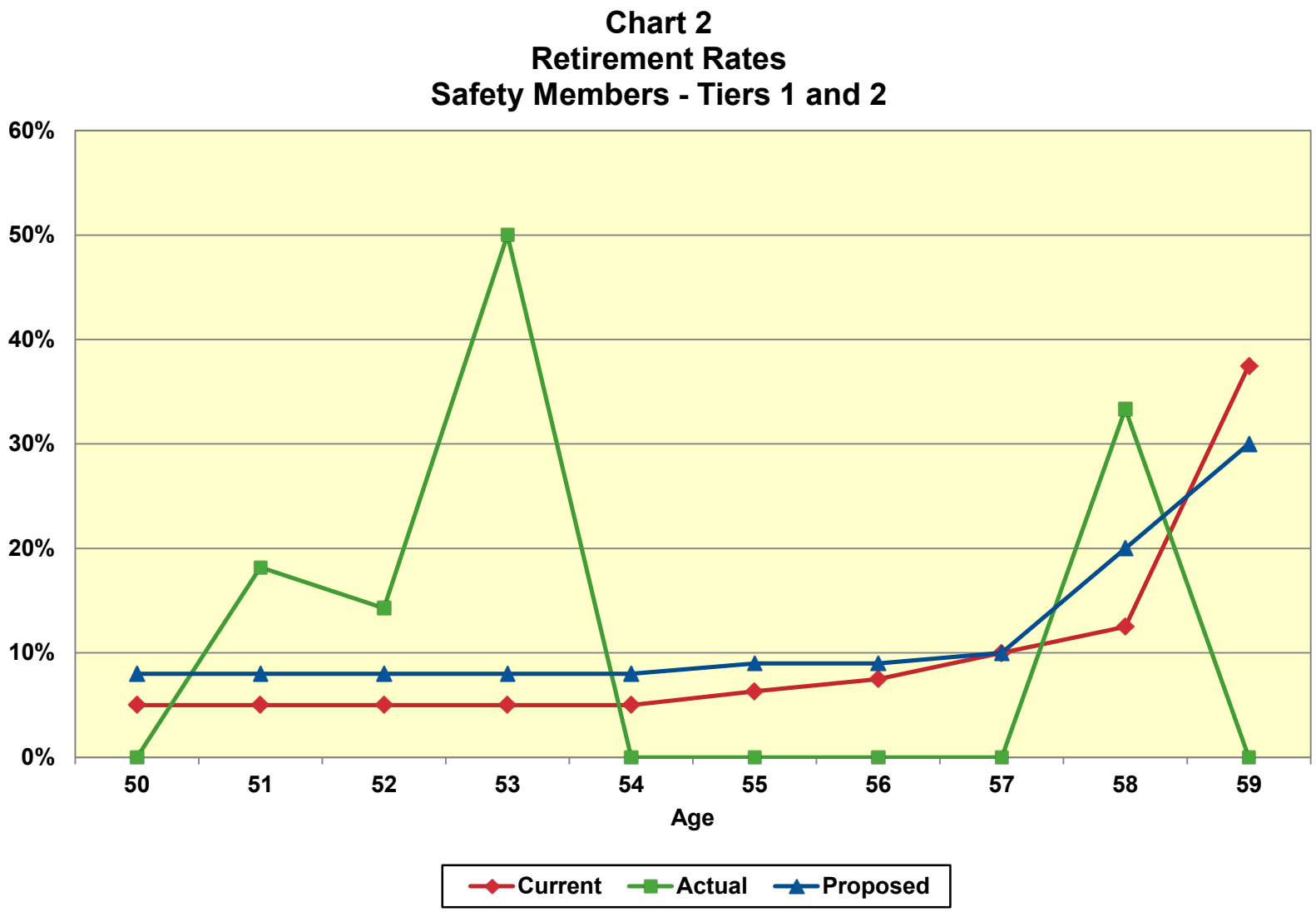
Chart 2
Retirement Rates
Safety Members - Tiers 1 and 2
60%
50%
40%
30%
20%
10%
0%
50
51
52
53
54
55
56
57
58
59
Age
Current
Actual
Proposed

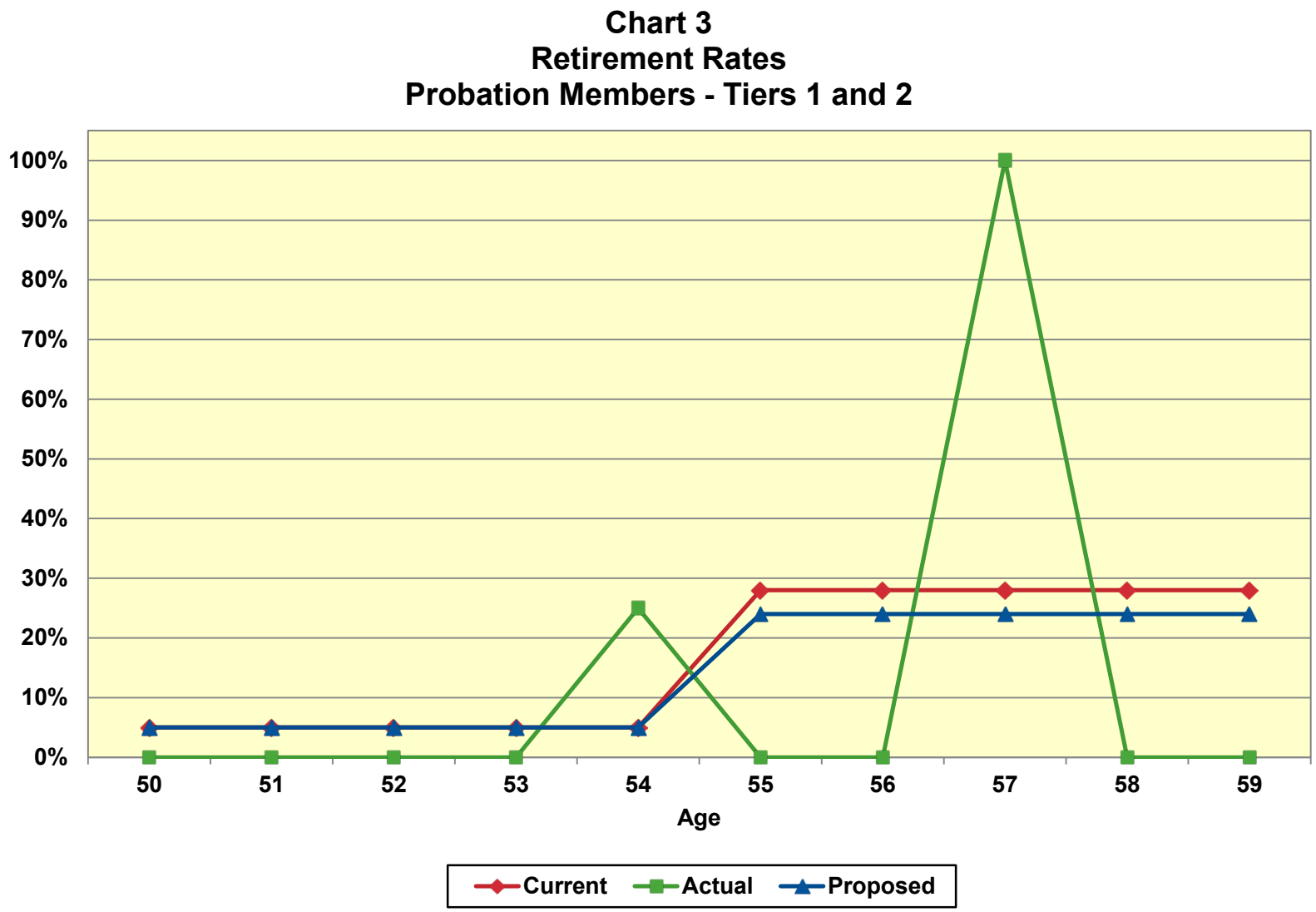
Chart 3
Retirement Rates
Probation Members - Tiers 1 and 2
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
50
51
52
53
54
55
56
57
58
59
Age
Current
Actual
Proposed

B. MORTALITY RATES - HEALTHY

The "healthy" mortality rates project what proportion of members will die before retirement as well as the life expectancy of a member who retires for service (i.e., who did not retire on a disability pension). For retirees, the tables currently being used for post-service retirement mortality rates are the RP-2000 Combined Healthy Mortality Tables, set back 2 years for General males, set back 1 year for General females, with no setback for Safety and Probation males, and set forward 1 year for Safety and Probation females. Beneficiary mortality is based on the tables used for General members.

For retirees, we are recommending a change to the RP-2000 Combined Healthy Mortality Tables projected with Scale BB to 2020, set back 1 year for males and with no setback for females. Beneficiary mortality will again be based on the tables used for members. Under the recommended mortality assumptions, we are no longer making a distinction between variation in mortality experience among General, Safety, and Probation members to recognize the relatively small Safety and Probation retiree population.

Post-service Retirement Mortality

Among healthy service retired members and all beneficiaries, the actual deaths compared to the expected deaths under the current and proposed assumptions for the last three years are as follows:

	Healthy General Pensioners and All Beneficiaries			**Healthy Safety & Probation Pensioners Only**		
Year Ending June 30,	**Actual Deaths**	**Current Expected Deaths**	**Proposed Expected Deaths**	**Actual Deaths**	**Current Expected Deaths**	**Proposed Expected Deaths**
2012	16	25	22	0	1	0
2013	33	27	23	3	1	1
2014	31	27	23	1	1	1
Total	80*	79	68	4	3	2
Actual / Expected		101%	118%		133%	200%

* *There were 76 deaths observed during the last experience study.*

Actuarial Standards of Practice strongly encourage that mortality assumptions reflect the expectation of continued mortality improvement in the future. To achieve this, we prefer to include a margin of at least 10% (i.e., an actual/expected ratio of at least 110%) in our proposed mortality assumptions. This approach leads to our recommendation of the RP-2000 Combined Healthy Mortality Tables projected with Scale BB to 2020, set back 1 year for and with no setback for females (all beneficiary mortality will be based

on the tables recommended for General members). Note that due to the small number of Safety and Probation pensioners, the margin under the proposed assumptions is well in excess of 10%. Charts 4 and 5 summarize the above information.

Charts 6 and 7 show the life expectancies under both the current and proposed tables.

Pre-Retirement Mortality

The number of deaths among active members is not large enough to provide credible statistics to develop a unique table. Therefore, we propose pre-retirement mortality follow the tables used for post-service retirement mortality.

Mortality Table for Member Contributions

We recommend that the mortality table used for determining contributions for General members be changed from the RP-2000 Combined Healthy Mortality Tables, set back 2 years for males and 1 year for females, weighted 30% male and 70% female, to the RP-2000 Combined Healthy Mortality Tables projected with Scale BB to 2020, set back 1 year for males and with no setback for females, weighted 30% male and 70% female. This is based on the proposed mortality tables for General members and the actual sex distribution for the current active General members.

For Safety and Probation members, we recommend the mortality table be changed from the RP-2000 Combined Healthy Mortality Tables, with no setback for males and set forward 1 year for females, weighted 80% male and 20% female, to the RP-2000 Combined Healthy Mortality Tables projected with Scale BB to 2020, set back 1 year for males and with no setback for females, weighted 80% male and 20% female. This is based on the proposed mortality tables for Safety and Probation members and the actual sex distribution for the current active Safety and Probation members.

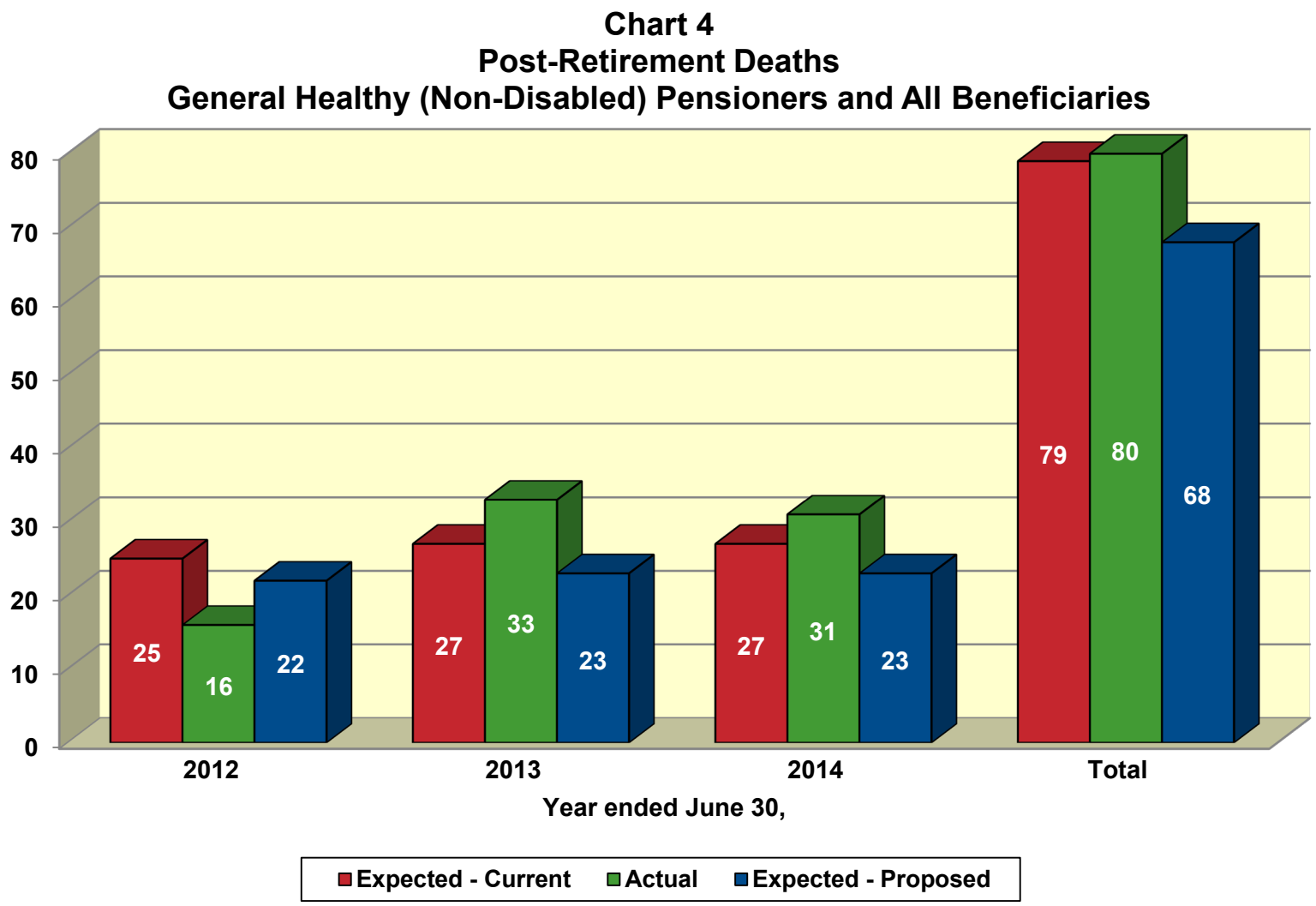
Chart 4
Post-Retirement Deaths
General Healthy (Non-Disabled) Pensioners and All Beneficiaries
80
70
60
50
40
30
20
10
0
25
16
22
27
33
23
27
31
23
79
80
68
2012
2013
2014
Total
Year ended June 30,
Expected - Current
Actual
Expected - Proposed

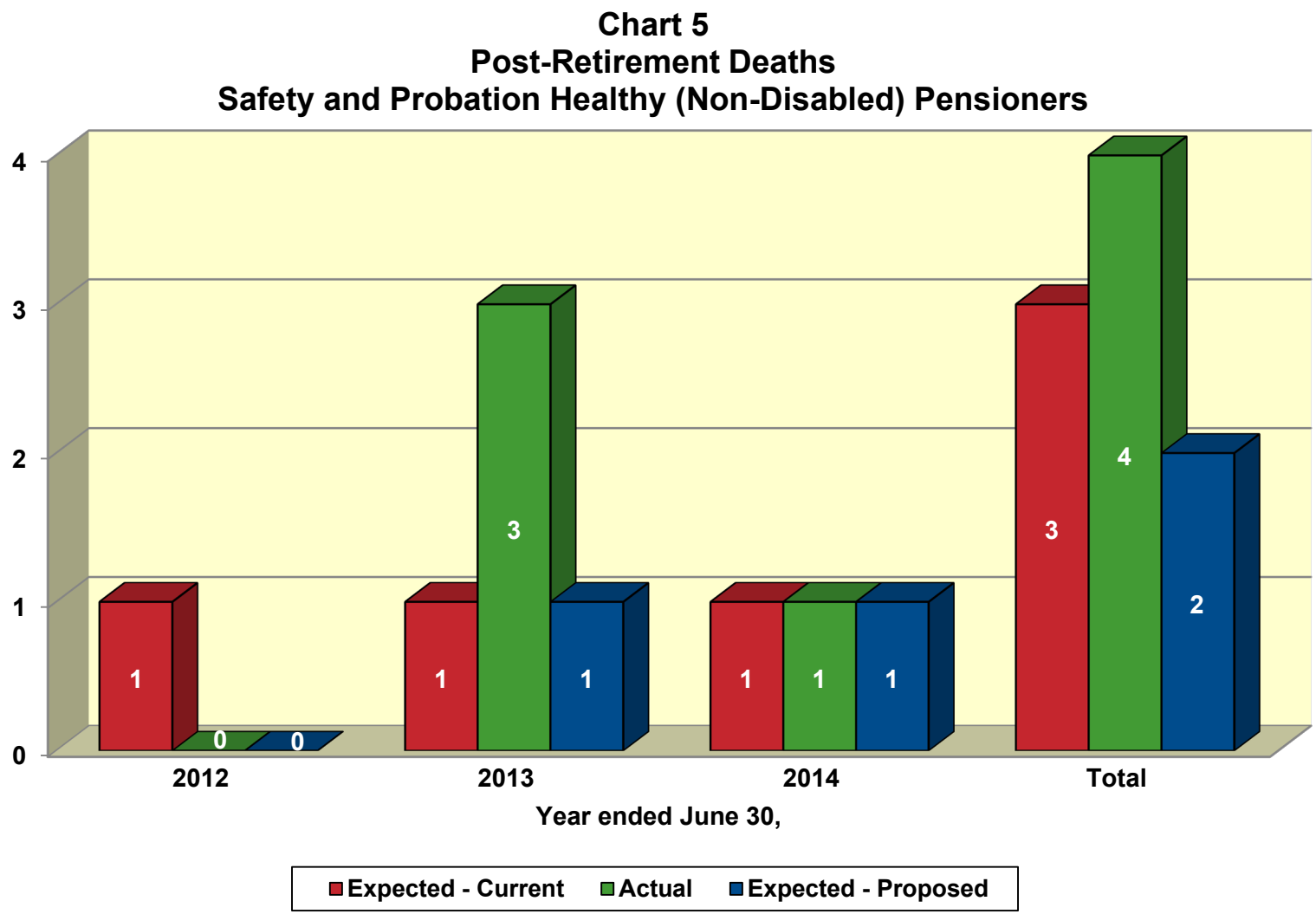
Chart 5
Post-Retirement Deaths
Safety and Probation Healthy (Non-Disabled) Pensioners
4
3
2
1
0
1
0
0
1
3
1
1
1
1
3
4
2
2012
2013
2014
Total
Year ended June 30,
Expected - Current
Actual
Expected - Proposed

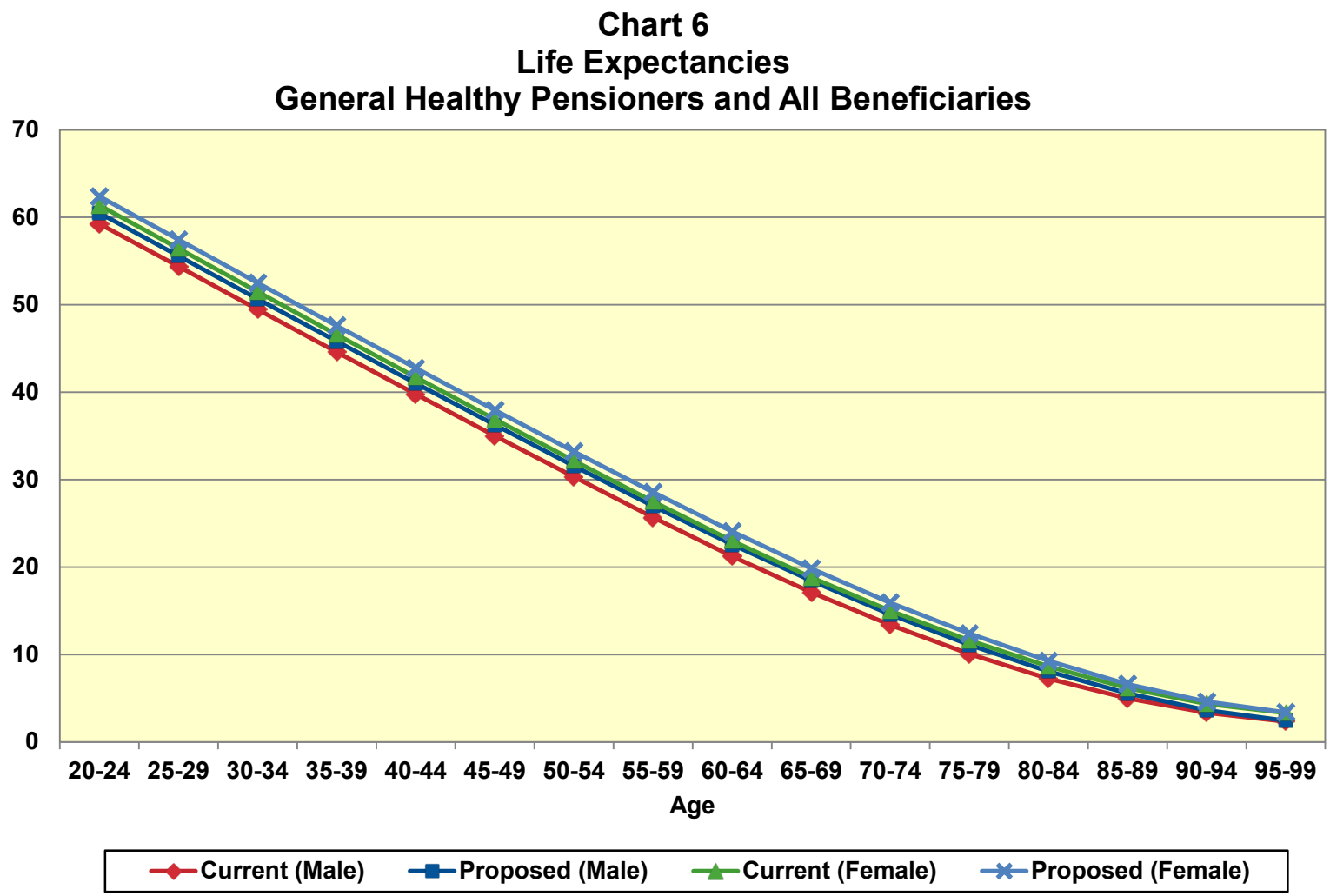
Chart 6
Life Expectancies
General Healthy Pensioners and All Beneficiaries
70
60
50
40
30
20
10
0
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90-94
95-99
Age
Current (Male)
Proposed (Male)
Current (Female)
Proposed (Female)

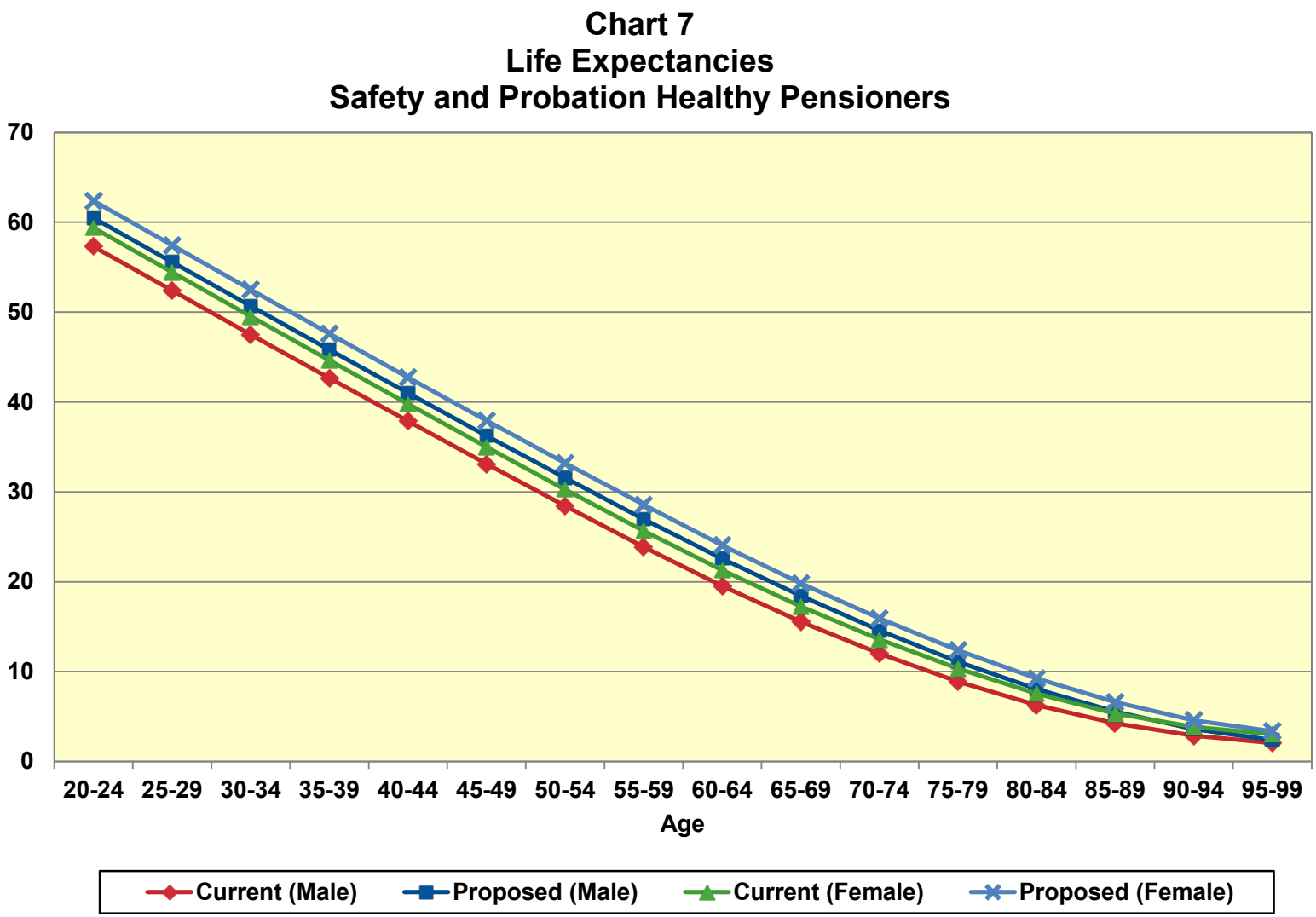
Chart 7
Life Expectancies
Safety and Probation Healthy Pensioners
70
60
50
40
30
20
10
0
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90-94
95-99
Age
Current (Male)
Proposed (Male)
Current (Female)
Proposed (Female)

C. MORTALITY RATES - DISABLED

Since death rates for disabled members can be higher than for healthy members, a different mortality assumption is often used. The tables currently being used are the RP-2000 Combined Healthy Mortality Tables for Males and Females, set forward 2 years for General males and females and set forward 4 years for Safety and Probation males and females.

We are recommending a change to the RP-2000 Combined Healthy Mortality Tables projected with Scale BB to 2020, set forward 4 years for General, Safety, and Probation males and females.

The number of actual deaths compared to the number expected for the last three years under the current and the proposed assumptions are as follows:

	Disabled General Pensioners			Disabled Safety & Probation Pensioners		
Year Ending June 30,	**Actual Deaths**	**Current Expected Deaths**	**Proposed Expected Deaths**	**Actual Deaths**	**Current Expected Deaths**	**Proposed Expected Deaths**
2012	3	2	2	0	1	1
2013	3	3	3	2	3	2
2014	5	2	2	2	2	2
Total	11	7	7	4	6	5
Actual / Expected		157%	157%		67%	80%

Actual Deaths from Previous Two Experience Studies		
2009 - 2011	10	3
2006 - 2008	5	7

	All Disabled Pensioners Combined		
Year Ending June 30,	**Actual Deaths**	**Current Expected Deaths**	**Proposed Expected Deaths**
2012 - 2014	15	13	12
Actual / Expected		115%	125%

Actual Deaths from Previous Two Experience Studies:	
2009 - 2011	13
2006 - 2008	12

Experience shows that there were more deaths than predicted by the current tables. (As there were relatively few disabled pensioners, we have also reviewed the actual number of deaths during each of the last two experience studies.) Based on this experience, and on the tables recommended for healthy mortality, we are recommending a change to the RP-2000 Combined Healthy Mortality Tables projected with Scale BB to 2020, set forward 4 years for General, Safety, and Probation males and females. Note that the proposed disability mortality tables for all members combined will provide our preferred margin of at least 10% based on the experience over the latest three-year period.

Charts 8 and 9 compare actual to expected deaths under both the current and proposed assumptions for disabled members over the last three years.

Charts 10 and 11 show the life expectancies under both the current and proposed tables.

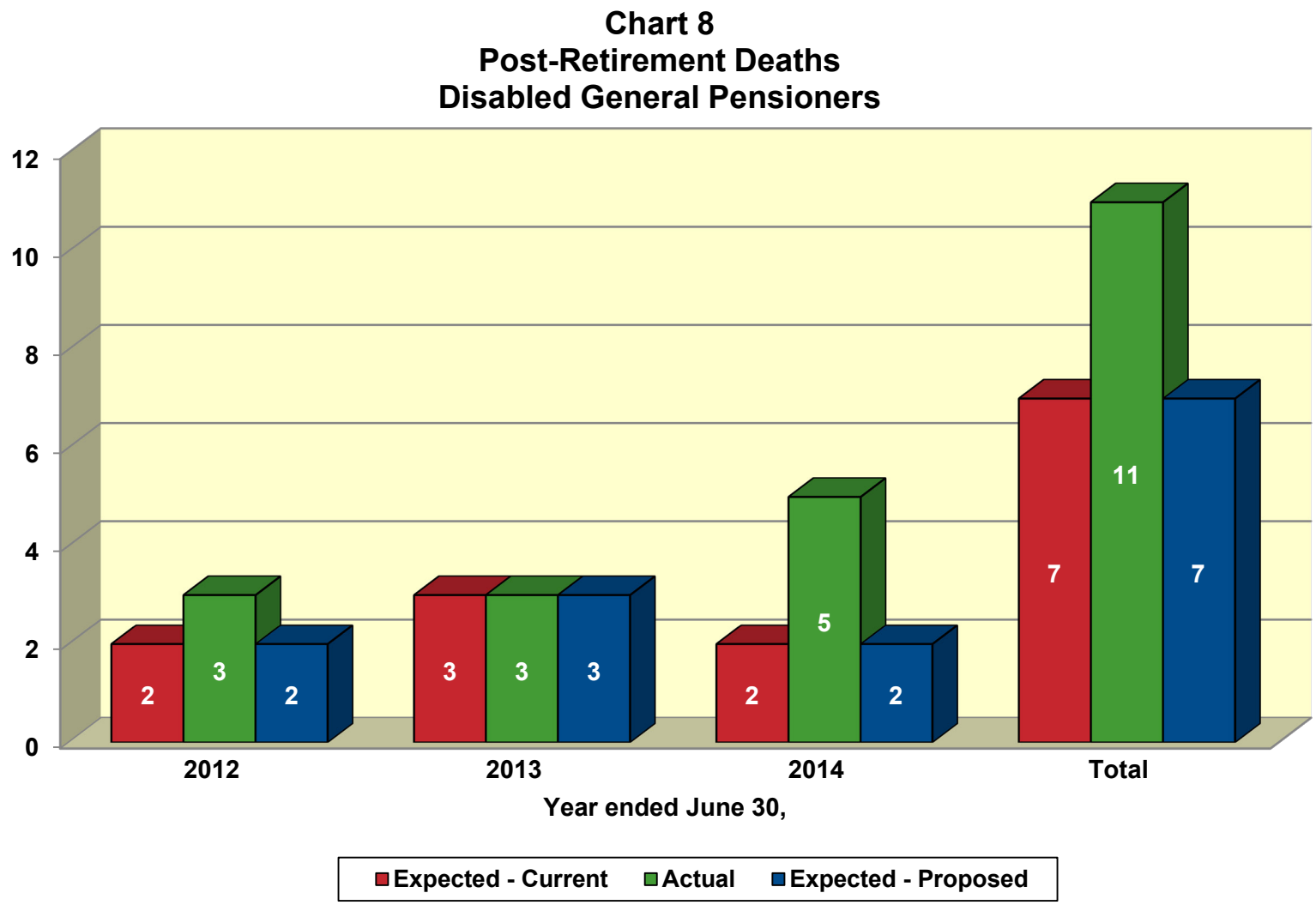
Chart 8
Post-Retirement Deaths
Disabled General Pensioners
12
10
8
6
4
2
0
2
3
2
3
3
3
2
5
2
7
11
7
2012
2013
2014
Total
Year ended June 30,
Expected - Current
Actual
Expected - Proposed

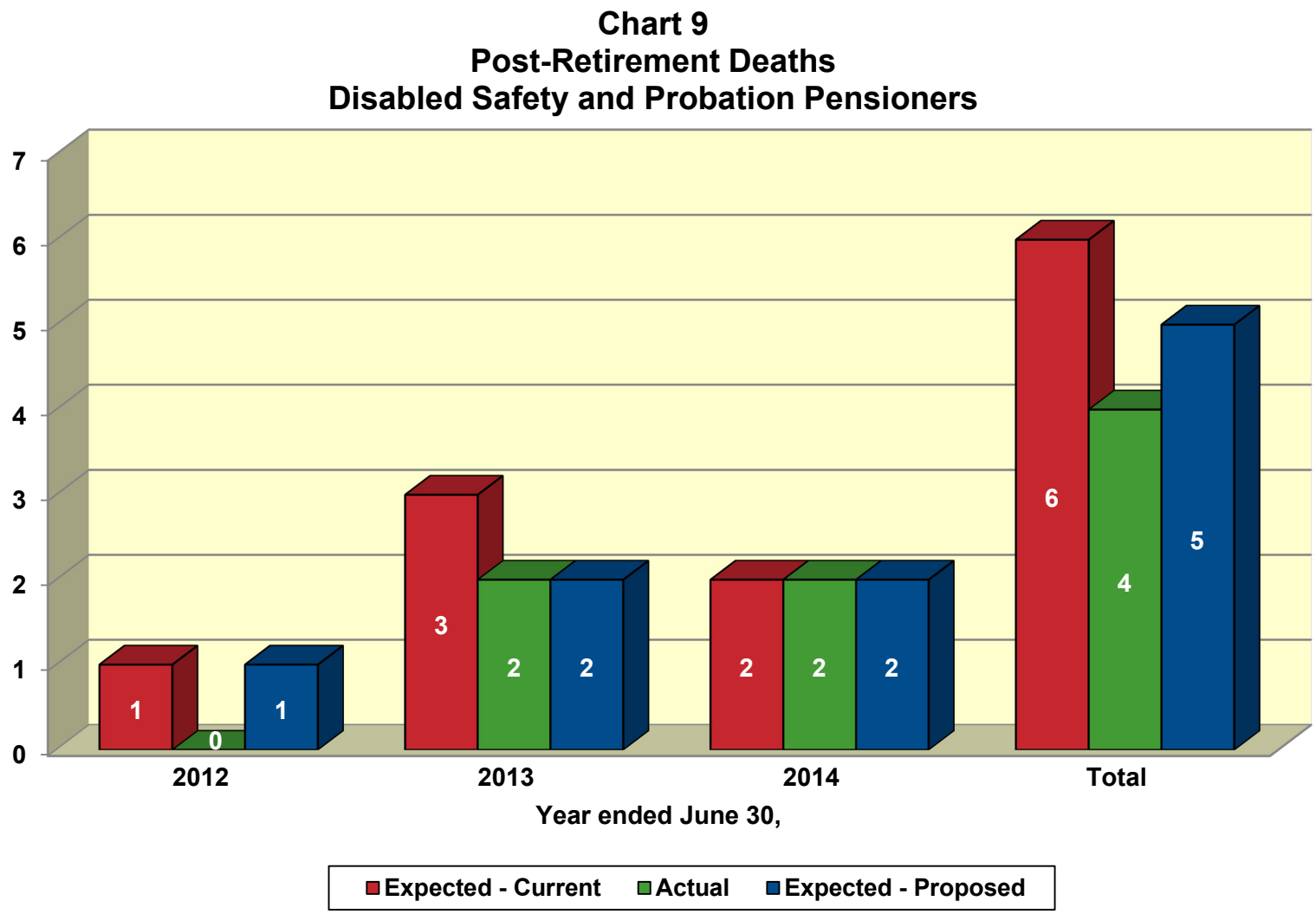
Chart 9
Post-Retirement Deaths
Disabled Safety and Probation Pensioners
7
6
5
4
3
2
1
0
1
0
1
3
2
2
2
2
2
6
4
5
2012
2013
2014
Total
Year ended June 30,
Expected - Current
Actual
Expected - Proposed

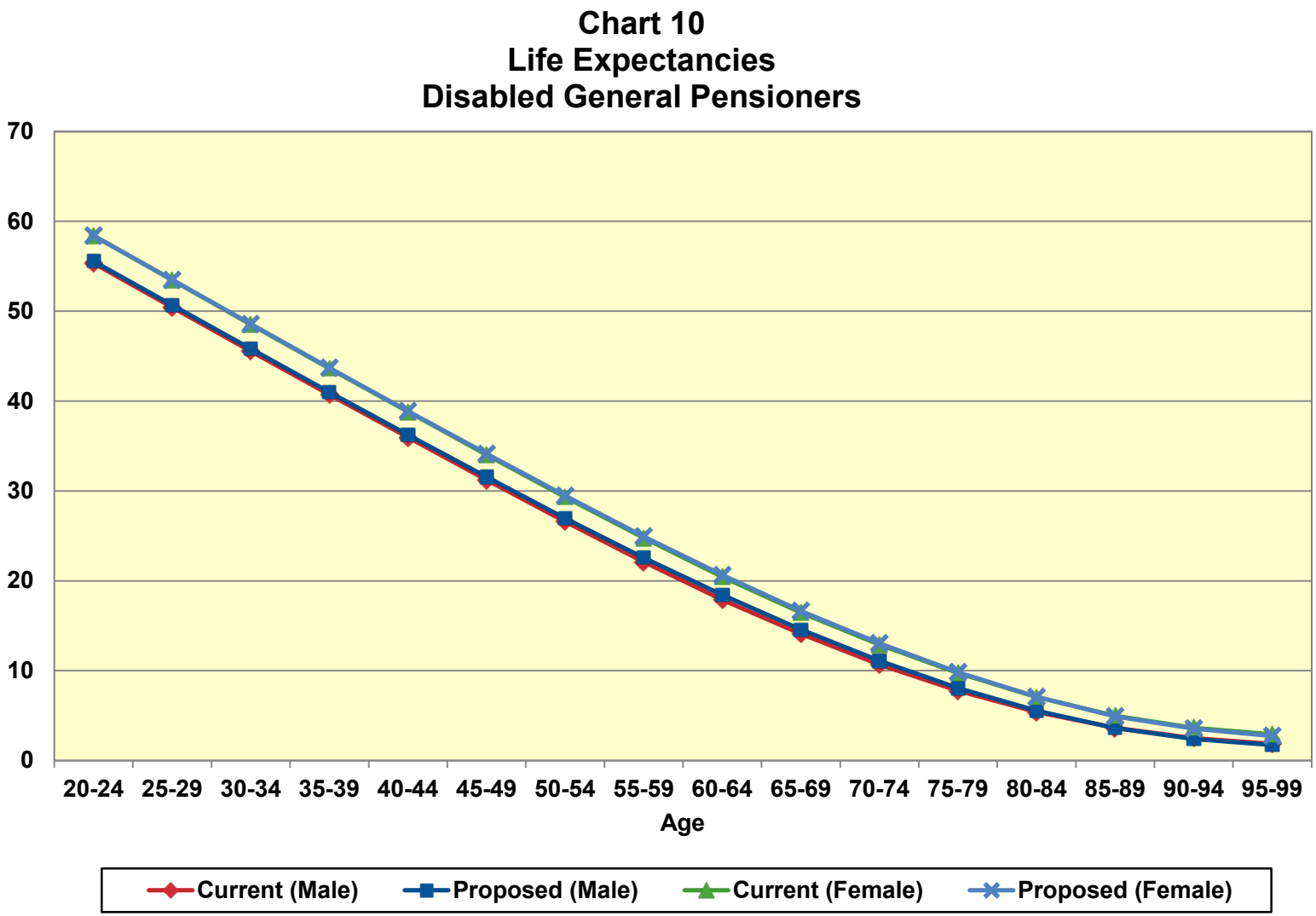
Chart 10
Life Expectancies
Disabled General Pensioners
70
60
50
40
30
20
10
0
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90-94
95-99
Age
Current (Male)
Proposed (Male)
Current (Female)
Proposed (Female)

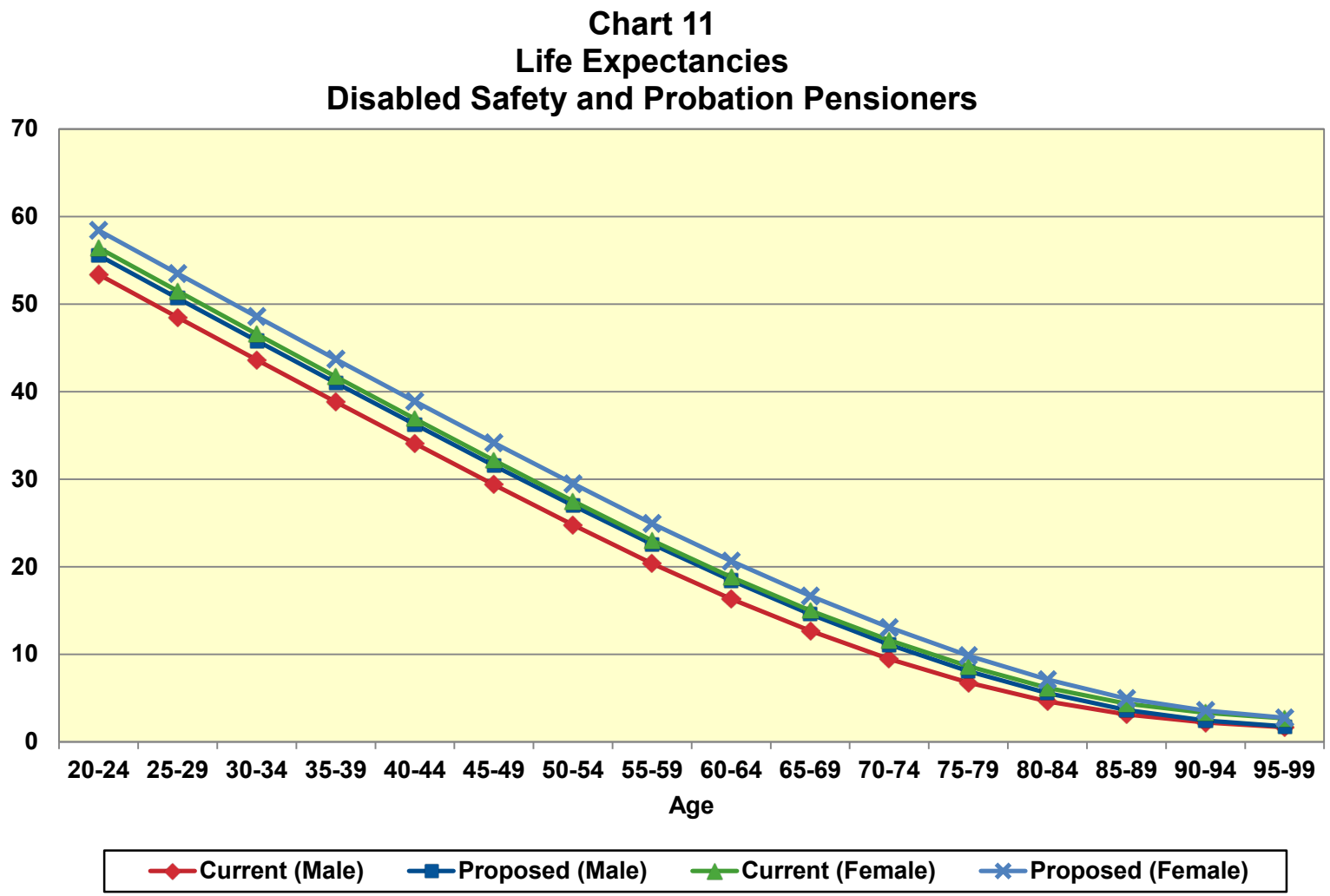
Chart 11
Life Expectancies
Disabled Safety and Probation Pensioners
70
60
50
40
30
20
10
0
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90-94
95-99
Age
Current (Male)
Proposed (Male)
Current (Female)
Proposed (Female)

D. TERMINATION RATES

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current assumptions, there is a separate set of assumptions for members with less than five years of service and for members with five or more years of service (which is an age-based assumption). There is also another set of assumptions to anticipate the percentage of members who will withdraw their contributions and members who will leave their contributions on deposit and receive a deferred vested benefit.

The termination experience over the last three years split between those members with under five years of service and those with five or more years of service is shown below:

Rates of Termination – General Members
(Less Than Five Years of Service)

Years of Service	Actual Rate	Current Assumption	Proposed Assumption
0	22.73%	14.50%	18.00%
1	26.97%	11.50%	16.00%
2	10.26%	10.50%	14.00%
3	12.69%	9.50%	12.00%
4	10.95%	8.50%	10.00%

Rates of Termination – Safety and Probation Members
(Less Than Five Years of Service)

Years of Service	Actual Rate	Current Assumption	Proposed Assumption
0	13.79%	11.00%	13.50%
1	33.33%	9.50%	11.50%
2	16.67%	7.50%	9.50%
3	0.00%	6.50%	7.50%
4	4.76%	5.50%	5.50%

Rates of Termination – General Members*
(Five or More Years of Service)

Age	Actual Rate	Current Assumption	Proposed Assumption
20 – 24	0.00%	4.50%	6.50%
25 – 29	16.67%	4.50%	6.50%
30 – 34	12.24%	4.50%	6.50%
35 – 39	3.29%	4.50%	6.50%
40 – 44	7.52%	4.50%	6.50%
45 – 49	7.25%	4.50%	6.50%
50 – 54	11.86%	4.50%	6.50%
55 – 59	8.46%	2.50%	5.50%
60 – 64	7.19%	2.00%	4.50%
65 – 69	19.35%	1.00%	3.50%

Rates of Termination – Safety and Probation Members*
(Five or More Years of Service)

Age	Actual Rate	Current Assumption	Proposed Assumption
20 – 24	0.00%	5.00%	5.00%
25 – 29	0.00%	4.50%	4.50%
30 – 34	12.50%	3.50%	4.00%
35 – 39	1.35%	3.50%	3.50%
40 – 44	2.60%	3.00%	3.00%
45 – 49	3.17%	2.00%	2.50%
50 – 54	0.00%	0.50%	0.50%
55 – 59	0.00%	0.00%	0.00%

* *At central age in age range shown.*

In developing the proposed assumptions, we have made smaller adjustments to account for the possibility that termination rates might have been influenced somewhat by the recent salary reductions.

Chart 12 compares actual to expected terminations of the past three years for both the current and proposed assumptions.

Chart 13 shows the current and proposed termination rates for General members with less than five years of service. Chart 14 shows the same information as Chart 13, but for Safety and Probation members combined.

Chart 15 shows the current and proposed termination rates for General members with five or more years of service. Chart 16 shows the same information as Chart 15, but for Safety and Probation members combined.

Based upon the recent experience, the proposed termination rates have mainly been increased. We continue to assume that all termination rates are zero for all members eligible to retire, that is, members eligible to retire at termination will retire rather than elect a refund or defer their benefit.

The following table shows the recommended percentages for members who are anticipated to withdraw their contributions and members who will leave their contributions on deposit and receive a deferred vested benefit. The current assumption is that 85% of all members who terminate with less than five years of service would withdraw and receive a refund and 15% would choose a deferred vested benefit. For the members with five or more years of service, current assumption is that 25% of all members who terminate would withdraw and receive a refund and 75% would choose a deferred vested benefit.

	Members with Less than Five Years of Service					
Group	**Observed Withdrawal**	**Observed Vested Termination**	**Current Withdrawal**	**Current Vested Termination**	**Proposed Withdrawal**	**Proposed Vested Termination**
All Combined	82%	18%	85%	15%	85%	15%

	Members with Five or More Years of Service					
Group	**Observed Withdrawal**	**Observed Vested Termination**	**Current Withdrawal**	**Current Vested Termination**	**Proposed Withdrawal**	**Proposed Vested Termination**
All Combined	26%	74%	25%	75%	25%	75%

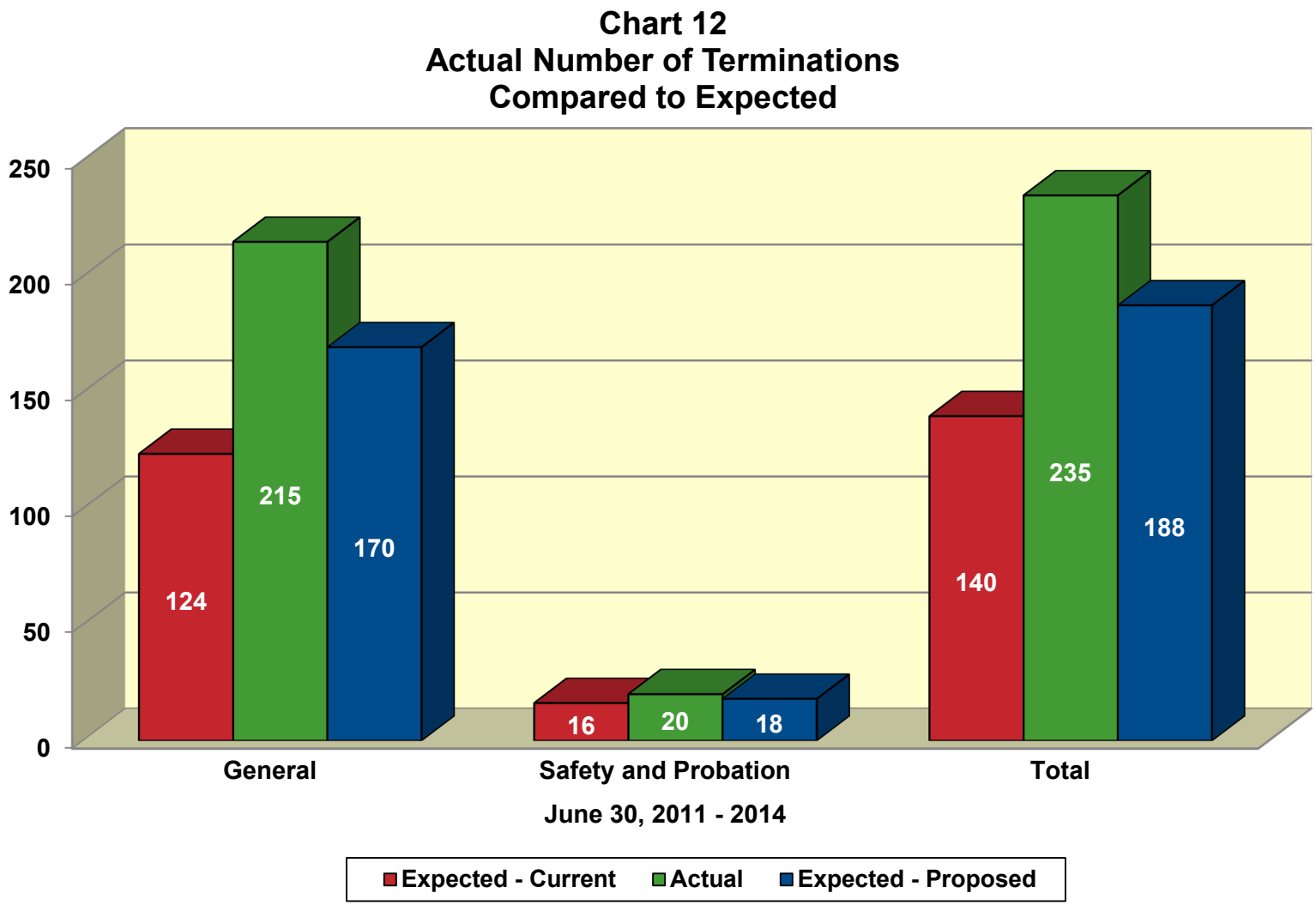
Chart 12
Actual Number of Terminations
Compared to Expected
250
200
150
100
50
0
124
215
170
16
20
18
140
235
188
General
Safety and Probation
Total
June 30, 2011 - 2014
Expected - Current
Actual
Expected - Proposed

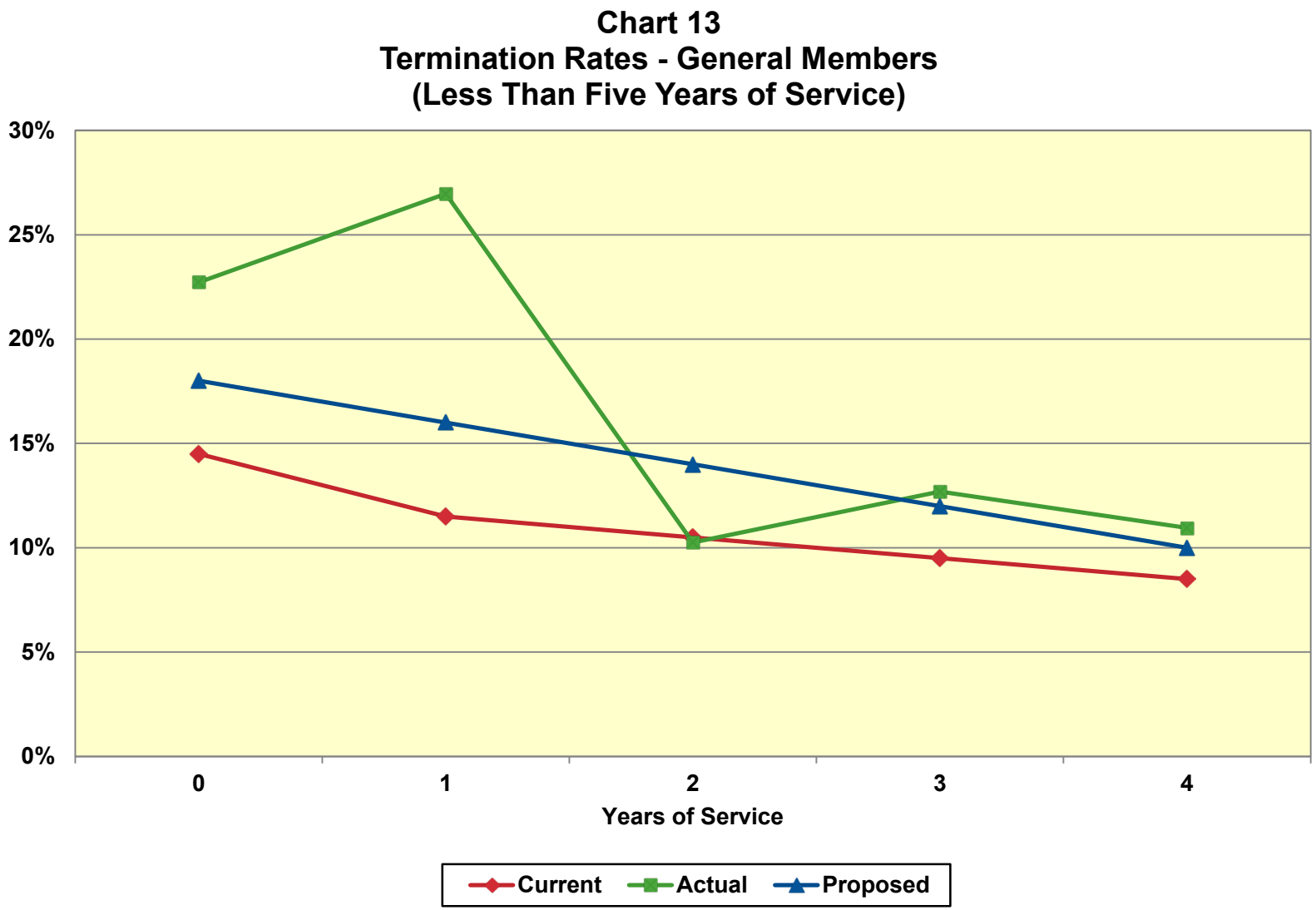
Chart 13
Termination Rates - General Members
(Less Than Five Years of Service)
30%
25%
20%
15%
10%
5%
0%
0
1
2
3
4
Years of Service
Current
Actual
Proposed

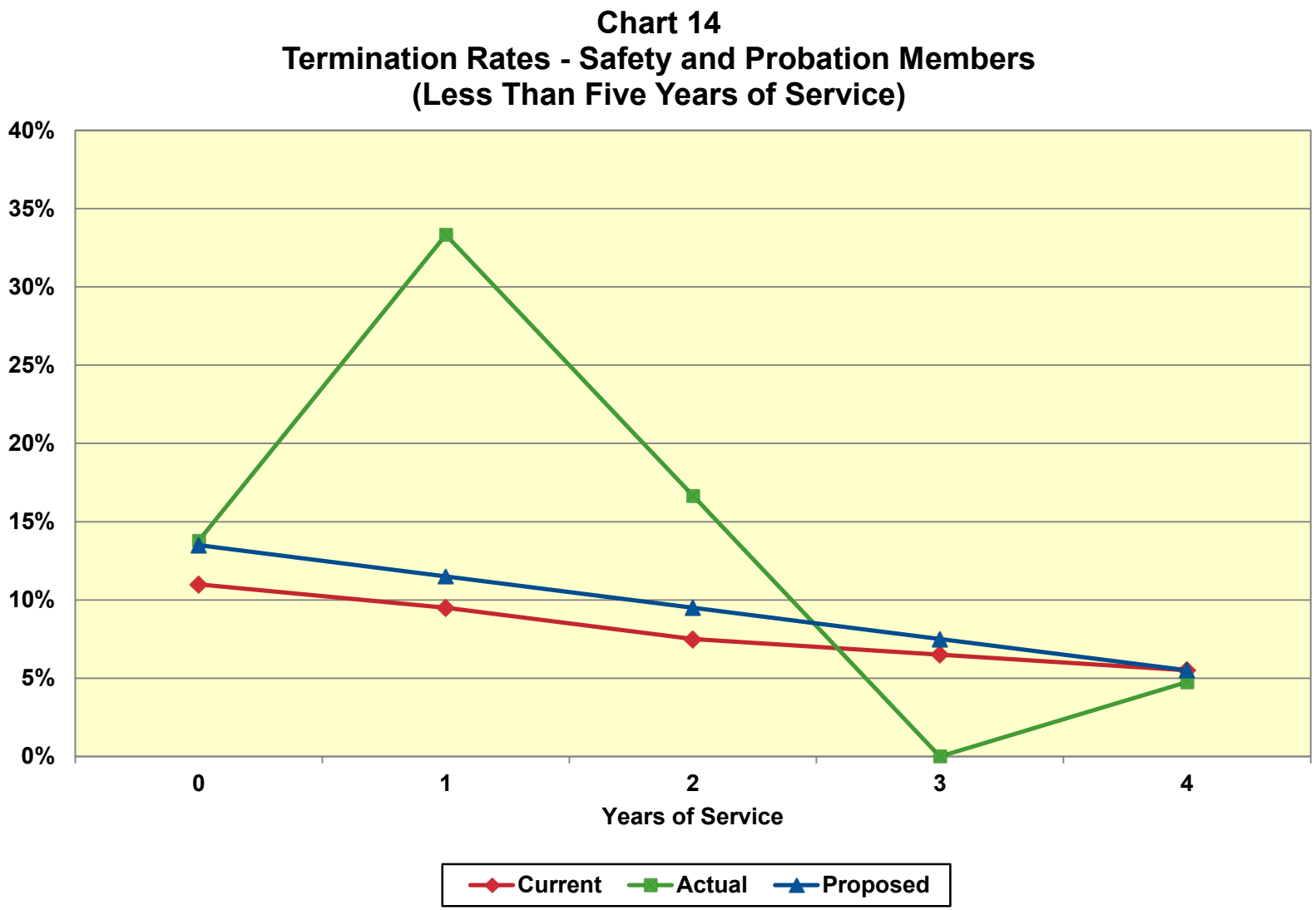
Chart 14
Termination Rates - Safety and Probation Members
(Less Than Five Years of Service)
40%
35%
30%
25%
20%
15%
10%
5%
0%
0
1
2
3
4
Years of Service
Current
Actual
Proposed

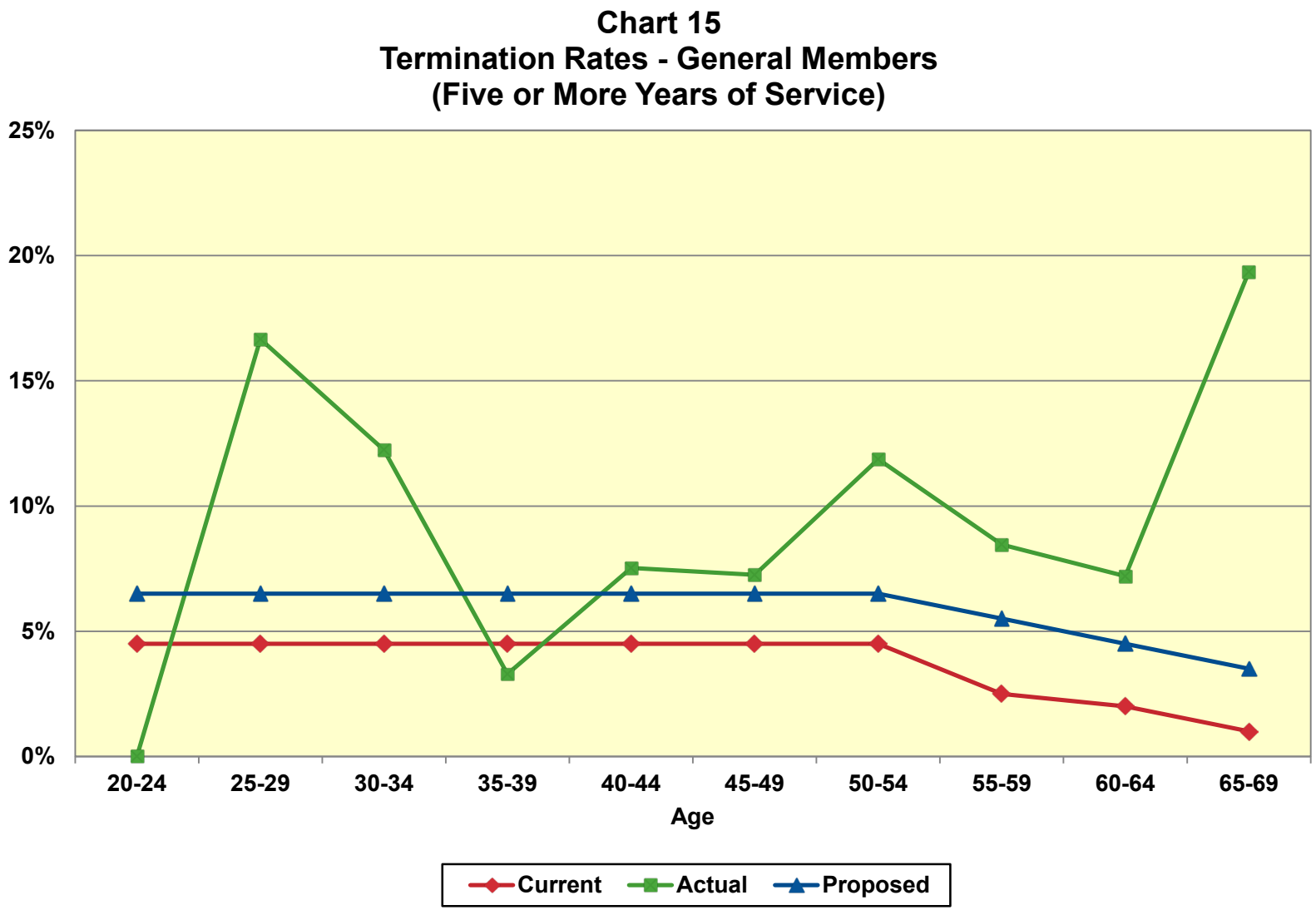
Chart 15
Termination Rates - General Members
(Five or More Years of Service)
25%
20%
15%
10%
5%
0%
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
Age
Current
Actual
Proposed

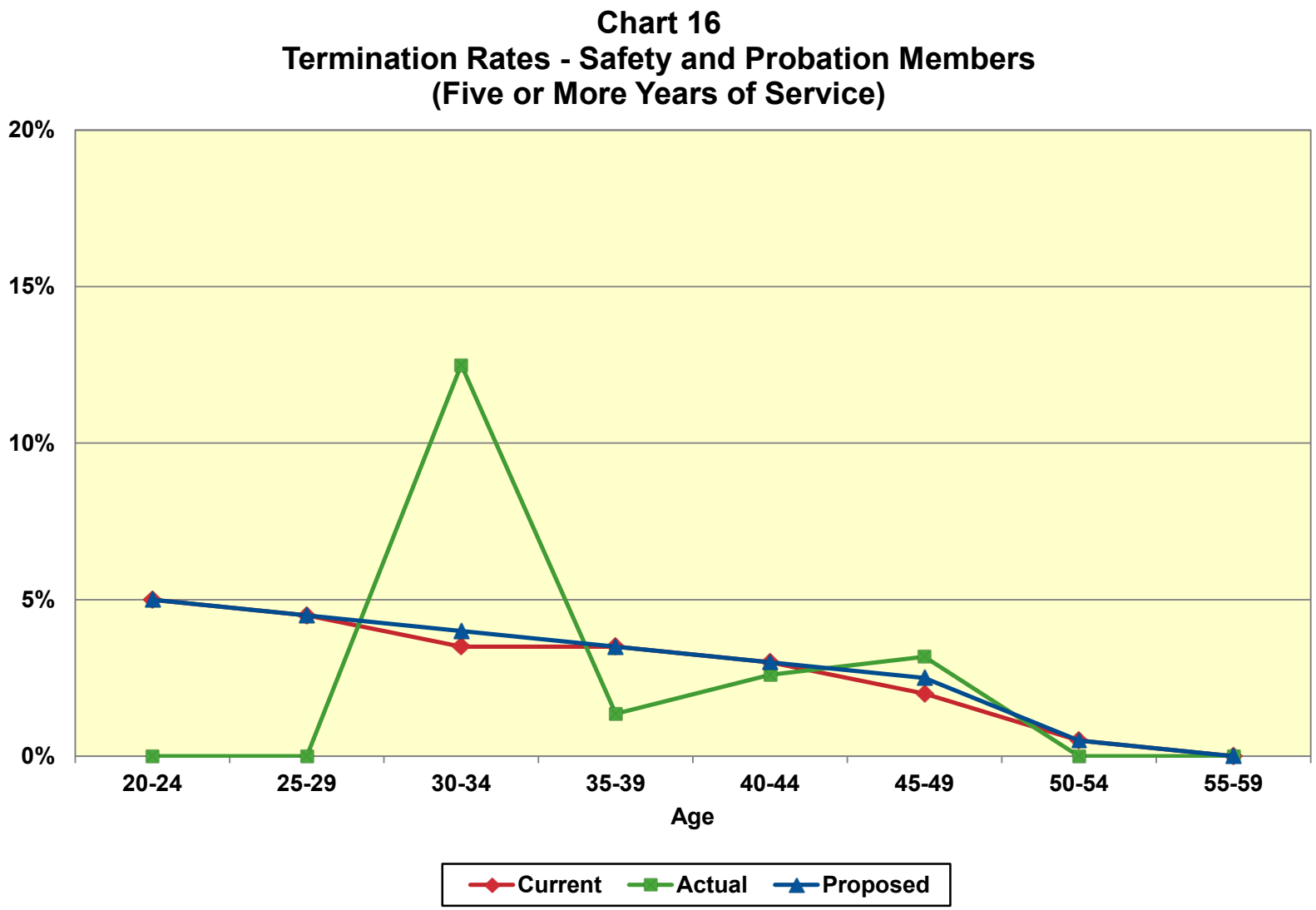
Chart 16
Termination Rates - Safety and Probation Members
(Five or More Years of Service)
20%
15%
10%
5%
0%
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
Age
Current
Actual
Proposed

E. DISABILITY INCIDENCE RATES

When a member becomes disabled, he or she may be entitled to either a 50% of final average compensation pension (service connected disability), or a pension that depends upon the member's years of service (non-service connected disability). The following summarizes the actual incidence of combined service connected and non-service connected disabilities over the past three years compared to the current and proposed assumptions for combined service connected and non-service connected disability incidence:

Rates of Disability Incidence (General)*

Age	Observed Rate	Current Rate	Proposed Rate
20 – 24	0.00%	0.01%	0.01%
25 – 29	0.00%	0.02%	0.01%
30 – 34	0.00%	0.02%	0.01%
35 – 39	0.00%	0.04%	0.02%
40 – 44	0.32%	0.08%	0.20%
45 – 49	0.55%	0.50%	0.50%
50 – 54	0.23%	0.55%	0.55%
55 – 59	1.17%	0.65%	0.60%
60 – 64	0.22%	0.80%	0.65%
65 – 69	0.93%	0.55%	0.60%

Rates of Disability Incidence (Safety and Probation)*

Age	Observed Rate	Current Rate	Proposed Rate
20 – 24	0.00%	0.20%	0.10%
25 – 29	0.00%	0.25%	0.15%
30 – 34	0.00%	0.40%	0.20%
35 – 39	2.30%	0.60%	0.75%
40 – 44	0.00%	1.50%	1.25%
45 – 49	1.01%	1.70%	1.50%
50 – 54	2.44%	3.00%	2.75%
55 – 59	2.56%	3.00%	2.75%

** At central age in age range shown.*

Chart 17 compares the actual number of service connected and non-service connected disabilities over the past three years to that expected under both the current and proposed assumptions. The proposed disability rates were adjusted to reflect the past three years' experience. Chart 18 shows actual disablement rates, compared to the assumed and proposed rates for General members. Chart 19 shows the same information for Safety and Probation members.

Since 22% of all new disabled General members in the prior three year period have received a service connected disability, we recommend that 40% of the proposed rates be used to anticipate service connected disability retirement (reduced from the current assumption of 50%). The remaining 60% of the rates will be used to anticipate non-service connected disability.

Since 100% of all new disabled Safety and Probation members in the prior three year period have received a service connected disability (observed experience for the prior three year period was 80%), we recommend maintaining the assumption that 90% of the proposed rates be used to anticipate service connected disability retirement. The remaining 10% of the rates will be used to anticipate non-service connected disability.

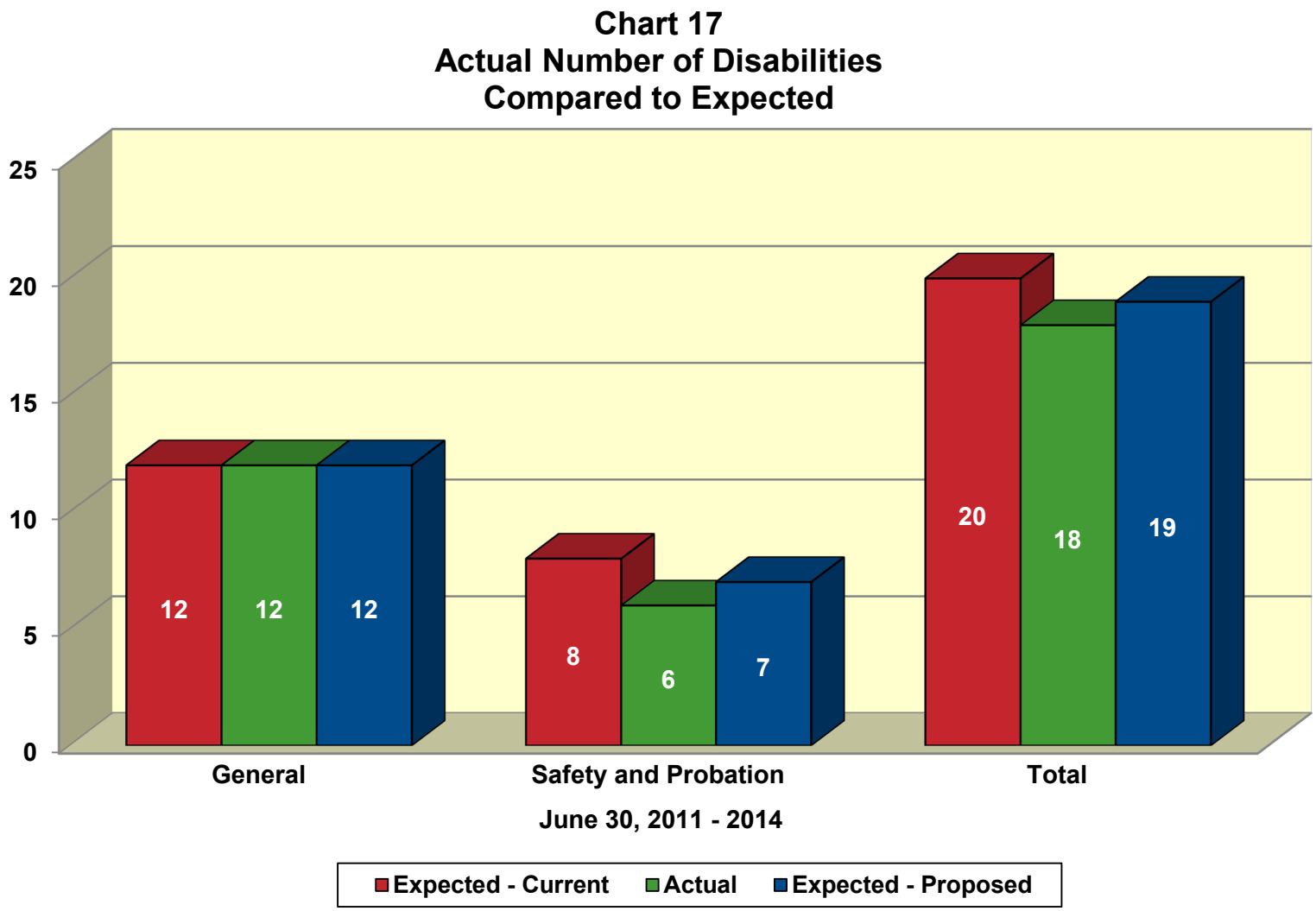
Chart 17
Actual Number of Disabilities
Compared to Expected
25
20
15
10
5
0
12
12
12
8
6
7
20
18
19
General
Safety and Probation
Total
June 30, 2011 - 2014
Expected - Current
Actual
Expected - Proposed

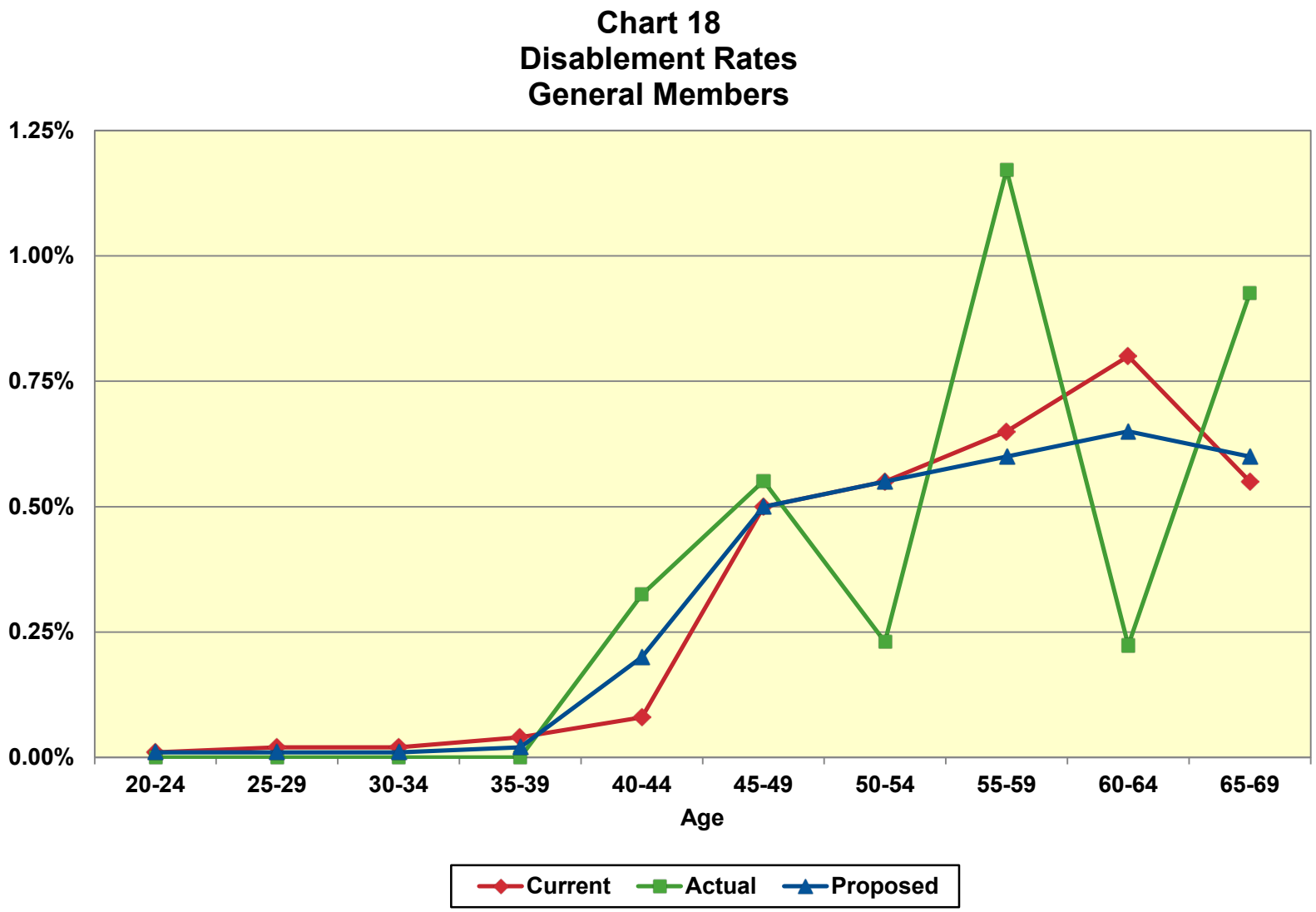
Chart 18
Disablement Rates
General Members
1.25%
1.00%
0.75%
0.50%
0.25%
0.00%
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
Age
Current
Actual
Proposed

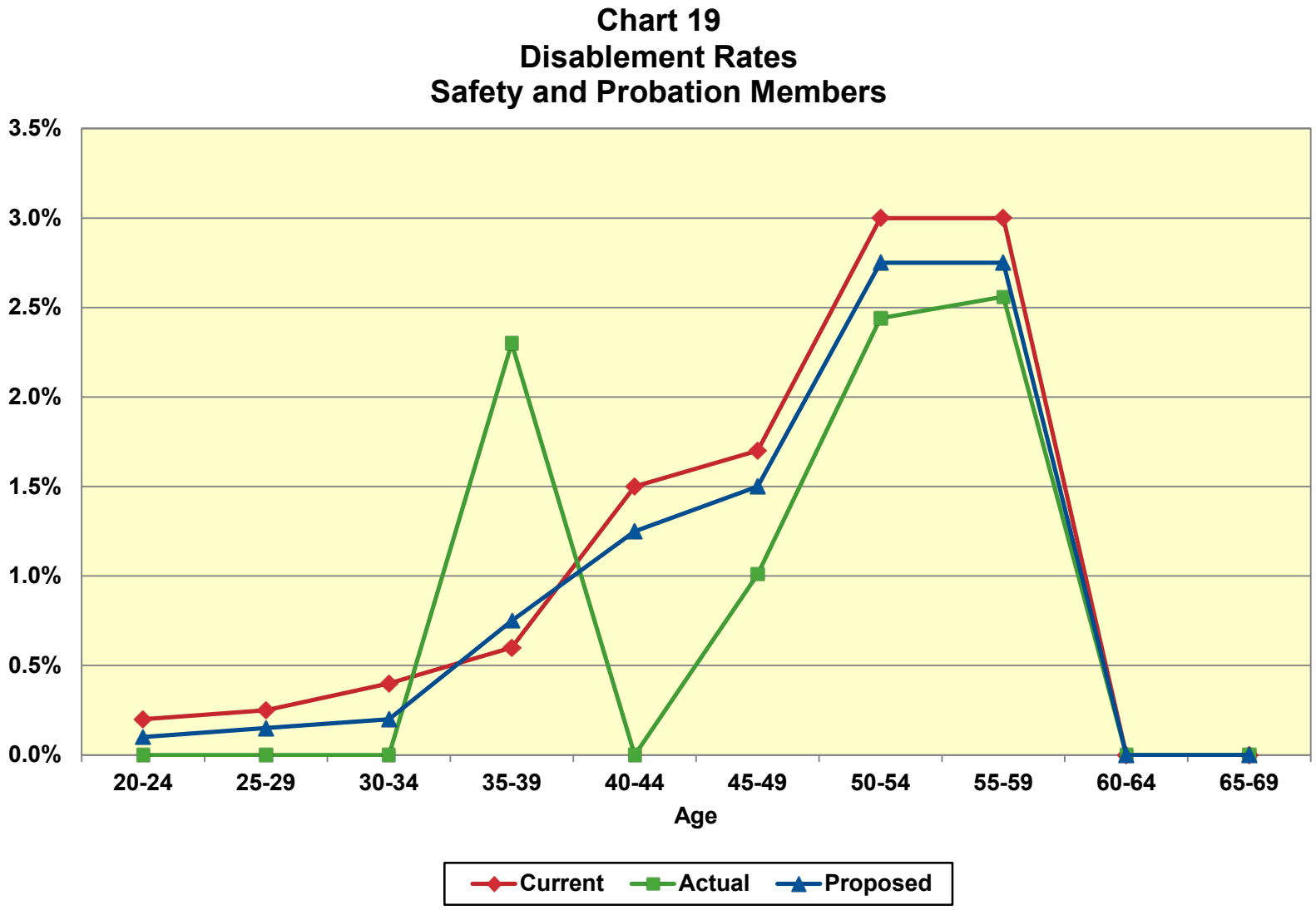
Chart 19
Disablement Rates
Safety and Probation Members
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
Age
Current
Actual
Proposed

F. SICK LEAVE

As previously discussed with the Board in our letter dated November 28, 2012, information related to the conversion of unused sick leave hours into service credit at retirement had not been provided to the actuary prior to the June 30, 2012 valuation. For the June 30, 2012 valuation, we collected data from MCERA on the number of hours of unused sick leave actually converted to service for all members who retired during the period July 1, 2011 – June 30, 2012. Based on this data, we developed a new actuarial assumption for the June 30, 2012 valuation to anticipate conversion of unused sick leave hours by active members into service credit at retirement, and the new assumption was adopted by the Board.

The current assumption for converting unused sick leave into additional service credit at retirement is that for each year of employment, an employee will convert approximately 0.019 years of sick leave into additional service credit at retirement. We have observed that the conversion of sick leave for new service retirees over each of the last three years has again averaged about 0.019 years for each year of employment. Based on this observed experience, we recommend that the sick leave conversion assumption be maintained at 0.019 years of additional service credit at retirement, for each year of employment.

G. VACATION CASH OUTS

As previously discussed with the Board in our letter dated November 28, 2012, we understand that for non-CalPEPRA members payments received from vacation cash outs are generally considered compensation earnable and have been reported in the aggregate to the actuary for the actuarial valuation, together with other elements of compensation earnable outside of base pay. However, if an active member were to have relatively lower vacation cash outs during employment compared to the final salary averaging period, the Association would experience an increase in the UAAL when such higher cash outs are ultimately used in determining the retirement benefit.

We have been exploring with the employer the feasibility of collecting historical vacation cash out data so as to determinate whether an assumption to anticipate conversion of relatively higher amounts of vacation cash outs immediately before retirement is warranted, for inclusion in future actuarial valuations.

APPENDIX A

CURRENT ACTUARIAL ASSUMPTIONS

Post-Retirement Mortality Rates:

Healthy Members and All Beneficiaries:

For General members and all beneficiaries: RP-2000 Combined Healthy Mortality Table, set back two years for males and set back one year for females.

For Safety and Probation members: RP-2000 Combined Healthy Mortality Table, with no setback for males and set forward one year for females.

Disabled Members:

For General members: RP-2000 Combined Healthy Mortality Table, set forward two years.

For Safety and Probation members: RP-2000 Combined Healthy Mortality Table, set forward four years.

Employee Contribution Rates:

For General members: RP-2000 Combined Healthy Mortality Table, set back two years for males and set back one year for females, weighted 30% male and 70% female.

For Safety and Probation members: RP-2000 Combined Healthy Mortality Table, with no setback for males and set forward one year for females, weighted 80% male and 20% female.

Termination Rates Before Retirement:

	Rate (%) Death			
	General[1]		Safety and Probation[2]	
Age	Male	Female	Male	Female
25	0.04	0.02	0.04	0.02
30	0.04	0.02	0.04	0.03
35	0.06	0.04	0.08	0.05
40	0.10	0.06	0.11	0.08
45	0.13	0.10	0.15	0.12
50	0.19	0.16	0.21	0.19
55	0.29	0.24	0.36	0.31
60	0.53	0.44	0.67	0.58
65	1.00	0.86	1.27	1.10

(1) *10% of General deaths are assumed to be service connected deaths. The other 90% are assumed to be non-service connected deaths.*

(2) *50% of Safety and Probation deaths are assumed to be service connected deaths. The other 50% are assumed to be non-service connected deaths.*

CURRENT ACTUARIAL ASSUMPTIONS

(continued)

Termination Rates Before Retirement (continued):

	Rate (%)		
	Disability		
Age	General[1]	Safety[2]	Probation[2]
20	0.01	0.20	0.20
25	0.02	0.23	0.23
30	0.02	0.34	0.34
35	0.03	0.52	0.52
40	0.06	1.14	1.14
45	0.33	1.62	1.62
50	0.53	2.48	2.48
55	0.61	3.00	3.00
60	0.74	0.00	0.00

(1) *50% of General disabilities are assumed to be service connected disabilities. The other 50% are assumed to be non-service connected disabilities.*

(2) *90% of Safety and Probation disabilities are assumed to be service connected disabilities. The other 10% are assumed to be non-service connected disabilities.*

CURRENT ACTUARIAL ASSUMPTIONS

(continued)

Termination Rates Before Retirement (continued):

	Rate (%)		
	Termination (Less than 5 Years of Service)[1]		
Years of Service	General	Safety	Probation
0	14.50	11.00	11.00
1	11.50	9.50	9.50
2	10.50	7.50	7.50
3	9.50	6.50	6.50
4	8.50	5.50	5.50

	Rate (%)		
	Termination (5+ Years of Service)[2]		
Age	General	Safety	Probation
20	4.50	5.00	5.00
25	4.50	4.70	4.70
30	4.50	3.90	3.90
35	4.50	3.50	3.50
40	4.50	3.20	3.20
45	4.50	2.40	2.40
50	4.50	1.10	1.10
55	3.30	0.20	0.20
60	2.20	0.00	0.00

(1) *85% of all terminated members will choose a refund of contributions and 15% will choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement.*

(2) *25% of all terminated members will choose a refund of contributions and 75% will choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement.*

CURRENT ACTUARIAL ASSUMPTIONS

(continued)

Retirement Rates:

	Rate (%)					
Age	General Tiers 1, 2, & 3	General Tier 4	Safety Tiers 1 & 2	Safety Tier 3	Probation Tiers 1 & 2	Probation Tier 3
50	5.00	0.00	5.00	3.00	5.00	4.00
51	5.00	0.00	5.00	3.00	5.00	4.00
52	5.00	6.00	5.00	3.00	5.00	4.00
53	5.00	3.00	5.00	3.00	5.00	4.00
54	5.00	3.00	5.00	3.00	5.00	4.00
55	7.00	5.00	6.31	4.00	28.00	14.00
56	7.00	5.00	7.50	6.00	28.00	25.00
57	7.00	5.00	10.00	7.00	28.00	25.00
58	7.00	5.00	12.50	9.00	28.00	25.00
59	7.00	5.00	37.50	30.00	28.00	25.00
60	10.00	6.00	100.00	100.00	100.00	100.00
61	15.00	9.00	100.00	100.00	100.00	100.00
62	20.00	12.00	100.00	100.00	100.00	100.00
63	15.00	14.00	100.00	100.00	100.00	100.00
64	15.00	12.00	100.00	100.00	100.00	100.00
65	38.00	32.00	100.00	100.00	100.00	100.00
66	38.00	32.00	100.00	100.00	100.00	100.00
67	38.00	32.00	100.00	100.00	100.00	100.00
68	38.00	32.00	100.00	100.00	100.00	100.00
69	38.00	32.00	100.00	100.00	100.00	100.00
70	100.00	100.00	100.00	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:

For deferred vested members, retirement age assumptions are as follows:

General Age:	60
Safety and Probation Age:	55

For future deferred vested members who terminate with less than five years of service and are not vested, it is assumed they will retire at age 70 if they decide to leave their contributions on deposit.

It is assumed that 60% of future deferred vested members will continue to work for a reciprocal employer. For reciprocals, 4.50% compensation increases per annum are assumed.

CURRENT ACTUARIAL ASSUMPTIONS

(continued)

Future Benefit Accruals: 1.0 year of service per year of employment plus 0.019 years of additional service to anticipate conversion of unused sick leave for each year of employment, for members expected to retire directly from active employment and to receive a service retirement benefit.

Unknown Data for Members: Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Inclusion of Deferred Vested Members: All deferred vested members are included in the valuation.

Percent Married: 80% of male members; 50% of female members.

Age of Spouse: Female (or male) spouses are 3 years younger (or older) than their spouses.

Net Investment Return: 7.75% per annum

Employee Contribution Crediting Rate: 7.75% per annum

Consumer Price Index: Increase of 3.50% per year, retiree COLA increases due to CPI for General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2 subject to a 3% maximum change per year (no COLA increases for General Tier 4, Safety Tier 3, or Probation Tier 3).

Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 3.50%; plus an additional 0.50% "across the board" salary increases (other than inflation); plus the following Merit and Promotional increases based on years of service.

Years of Service	General	Safety and Probation
0 - 1	5.00%	5.00%
1 – 2	3.75%	3.75%
2 - 3	3.50%	3.00%
3 – 4	2.75%	2.25%
4 – 5	2.25%	1.00%
5+	0.50%	0.50%

APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS

Post-Retirement Mortality Rates:

Healthy Members and All Beneficiaries: For all members and all beneficiaries: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back 1 year for males and with no setback for females.

Disabled Members: For all members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set forward four years for both males and females.

Employee Contribution Rates: For General members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back 1 year for males and with no setback for females, weighted 30% male and 70% female.

For Safety and Probation members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2020, set back 1 year for males and with no setback for females, weighted 80% male and 20% female.

Termination Rates Before Retirement:

	Rate (%)			
	Death			
	General[1]		Safety and Probation[2]	
Age	Male	Female	Male	Female
25	0.04	0.02	0.04	0.02
30	0.04	0.02	0.04	0.02
35	0.07	0.04	0.07	0.04
40	0.10	0.07	0.10	0.07
45	0.13	0.11	0.13	0.11
50	0.19	0.16	0.19	0.16
55	0.30	0.25	0.30	0.25
60	0.53	0.41	0.53	0.41
65	0.90	0.76	0.90	0.76

(1) *10% of General deaths are assumed to be service connected deaths. The other 90% are assumed to be non-service connected deaths.*

(2) *50% of Safety and Probation deaths are assumed to be service connected deaths. The other 50% are assumed to be non-service connected deaths.*

PROPOSED ACTUARIAL ASSUMPTIONS

(continued)

Termination Rates Before Retirement (continued):

	Rate (%)		
	Disability		
Age	**General[1]**	**Safety[2]**	**Probation[2]**
20	0.01	0.10	0.10
25	0.01	0.13	0.13
30	0.01	0.18	0.18
35	0.02	0.53	0.53
40	0.13	1.05	1.05
45	0.38	1.40	1.40
50	0.53	2.25	2.25
55	0.58	2.75	2.75
60	0.63	0.00	0.00

(1) *40% of General disabilities are assumed to be service connected disabilities. The other 60% are assumed to be non-service connected disabilities.*

(2) *90% of Safety and Probation disabilities are assumed to be service connected disabilities. The other 10% are assumed to be non-service connected disabilities.*

PROPOSED ACTUARIAL ASSUMPTIONS

(continued)

Termination Rates Before Retirement (continued):

Years of Service	Rate (%) Termination (Less than 5 Years of Service)[1] General	Safety	Probation
0	18.00	13.50	13.50
1	16.00	11.50	11.50
2	14.00	9.50	9.50
3	12.00	7.50	7.50
4	10.00	5.50	5.50

Age	Rate (%) Termination (5+ Years of Service)[2] General	Safety	Probation
20	6.50	5.00	5.00
25	6.50	4.70	4.70
30	6.50	4.20	4.20
35	6.50	3.70	3.70
40	6.50	3.20	3.20
45	6.50	2.70	2.70
50	6.50	1.30	1.30
55	5.90	0.20	0.20
60	4.90	0.00	0.00

(1) *85% of all terminated members will choose a refund of contributions and 15% will choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement.*

(2) *25% of all terminated members will choose a refund of contributions and 75% will choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement.*

PROPOSED ACTUARIAL ASSUMPTIONS

(continued)

Retirement Rates:

	Rate (%)					
Age	General Tiers 1, 2, & 3	General Tier 4	Safety Tiers 1 & 2	Safety Tier 3	Probation Tiers 1 & 2	Probation Tier 3
50	6.00	0.00	8.00	3.00	5.00	4.00
51	6.00	0.00	8.00	3.00	5.00	4.00
52	6.00	6.00	8.00	3.00	5.00	4.00
53	6.00	3.00	8.00	3.00	5.00	4.00
54	6.00	3.00	8.00	3.00	5.00	4.00
55	10.00	5.00	9.00	4.00	24.00	14.00
56	10.00	5.00	9.00	6.00	24.00	25.00
57	10.00	5.00	10.00	7.00	24.00	25.00
58	10.00	5.00	20.00	9.00	24.00	25.00
59	10.00	5.00	30.00	30.00	24.00	25.00
60	12.00	6.00	100.00	100.00	100.00	100.00
61	20.00	9.00	100.00	100.00	100.00	100.00
62	26.00	12.00	100.00	100.00	100.00	100.00
63	20.00	14.00	100.00	100.00	100.00	100.00
64	20.00	12.00	100.00	100.00	100.00	100.00
65	45.00	32.00	100.00	100.00	100.00	100.00
66	45.00	32.00	100.00	100.00	100.00	100.00
67	45.00	32.00	100.00	100.00	100.00	100.00
68	45.00	32.00	100.00	100.00	100.00	100.00
69	45.00	32.00	100.00	100.00	100.00	100.00
70	100.00	100.00	100.00	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:

For deferred vested members, retirement age assumptions are as follows:

General Age:	60
Safety and Probation Age:	55

For future deferred vested members who terminate with less than five years of service and are not vested, it is assumed they will retire at age 70 if they decide to leave their contributions on deposit.

It is assumed that 60% of future deferred vested members will continue to work for a reciprocal employer. For reciprocals, 4.25% compensation increases per annum are assumed.

PROPOSED ACTUARIAL ASSUMPTIONS

(continued)

Future Benefit Accruals: 1.0 year of service per year of employment plus 0.019 years of additional service to anticipate conversion of unused sick leave for each year of employment, for members expected to retire directly from active employment and to receive a service retirement benefit.

Unknown Data for Members: Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Inclusion of Deferred Vested Members: All deferred vested members are included in the valuation.

Percent Married: 75% of male members; 50% of female members.

Age of Spouse: Female (or male) spouses are 3 years younger (or older) than their spouses.

	Option A	Option B
Net Investment Return:	7.50%	7.25%
Administrative Expenses:	1.5% of payroll	N/A (implicit in net investment return)
Employee Contribution Crediting Rate:	7.50%	7.25%

Consumer Price Index: Increase of 3.25% per year, retiree COLA increases due to CPI for General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2 subject to a 3% maximum change per year (no COLA increases for General Tier 4, Safety Tier 3, or Probation Tier 3).

Salary Increases:

Annual Rate of Compensation Increase (%)

Inflation: 3.25%; plus an additional 0.50% "across the board" salary increases (other than inflation); plus the following Merit and Promotional increases based on years of service.

Years of Service	General	Safety and Probation
0 - 1	5.00%	5.00%
1 – 2	3.75%	3.75%
2 - 3	3.50%	3.00%
3 – 4	2.75%	2.25%
4 – 5	2.25%	1.00%
5+	0.50%	0.50%