San Diego County Employees Retirement Association

ACTUARIAL EXPERIENCE STUDY OF ECONOMIC AND DEMOGRAPHIC ASSUMPTIONS

Analysis of Actuarial Experience
During the Period
July 1, 2012 through June 30, 2015

100 Montgomery Street, Suite 500
San Francisco, CA 94104

Copyright ©2016
All rights reserved
June 2016

Segal Consulting

100 Montgomery Street Suite 500 San Francisco, CA 94104-4308
T 415.263.8200 www.segalco.com

June 2, 2016

Board of Retirement
San Diego County Employees Retirement Association
2275 Rio Bonito Way, Suite 200
San Diego, CA 92108-1685

Re: Review of Economic and Demographic Actuarial Assumptions for the June 30, 2016 Actuarial Valuation

Dear Members of the Board:

We are pleased to submit this report of our review of the economic and demographic actuarial experience of the San Diego County Employees Retirement Association (SDCERA). This study utilizes the census data for the period July 1, 2012 to June 30, 2015 and provides the proposed actuarial assumptions to be used effective with the June 30, 2016 valuation.

We are Members of the American Academy of Actuaries and we 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,

Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President and Actuary

Andy Yeung, ASA, MAAA, FCA, EA
Vice President and Actuary

AW/hy

5421987v3/05536.119

TABLE OF CONTENTS

Page

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 assumptions, 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 means that that year's 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.

The last full review of the actuarial assumptions was as of June 30, 2013. Prior to the June 30, 2015 valuation, Segal informed the Board that beginning in 2015 Segal's California public practice has been recommending lowering the inflation assumption from 3.25% to 3.00% and the Board could consider lowering inflation assumption for the June 30, 2015 valuation. That assumption change was recommended to the Board in our August 26, 2015 report letter and was approved by the Board on September 3, 2015. As the price inflation assumption is a "building block" used in the development of other economic assumptions, the Board also approved our recommendation to reduce the investment return assumption from 7.75% to 7.50% and the wage inflation assumption from 4.00% to 3.75%, all effective with the June 30, 2015 actuarial valuation.

This study was undertaken in order to review the actuarial assumptions and for the demographic assumptions, to compare the actual experience with that expected under the current assumptions during the three-year experience period from July 1, 2012 through June 30, 2015. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 35, "Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations" and, ASOP No. 27 "Selection of 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 future experience, we recommend various changes in the current actuarial assumptions.

Please note that consistent with all previous reviews of the economic assumptions performed for the Board by Segal, the investment return assumption recommended in this report has been developed without taking into consideration the impact of any future allocations of "excess earnings" as described in the Board's Interest Crediting and Excess Earnings Policy.

We are recommending changes in the investment return, "across the board" salary increase assumptions, retirement from active employment, reciprocity, age difference between female members and their beneficiaries entitled to an automatic survivor benefit, pre-retirement mortality, healthy life post-retirement mortality, disabled life post-retirement mortality, termination (refund of contributions and vested termination), disability (non-service connected and service connected), salary increases, and premium pay assumptions.

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

Inflation – Future increases in the Consumer Price Index (CPI) which drive investment returns and active member salary increases, as well as COLA increases to retired members.
Recommendation: Maintain the current inflation assumption at 3.00% per annum as developed in Section III (A).

Investment Return – The estimated average future rate of return, net of investment expenses, on current and future assets of SDCERA as of the valuation date. This rate is used to discount liabilities.
Recommendation: Reduce the current investment return assumption from 7.50% per annum to 7.25% per annum based on updated market return expectations for different asset classes and on SDCERA's latest asset allocation as developed in Section III (B). The 7.25% recommendation is consistent with the Board's past practice of having a margin for adverse deviation under the risk adjusted model used by Segal.

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

- Inflationary salary increases,
- Real "across the board" salary increases, and
- Merit and promotional increases.

Recommendation: Maintain the current inflationary salary increase at 3.00% and reduce the current real "across the board" salary increase assumption from 0.75% to 0.50%. This means that the combined inflationary and real "across the board" salary increases will decrease from 3.75% to 3.50% per annum as developed in Section III (C). The review of the merit and promotional increase component of the salary increase assumption is provided in Section IV (F).

Retirement Rates - The probability of retirement at each age at which participants are eligible to retire.
Recommendation: We recommend adjusting the retirement rates to those developed in Section IV (A) for both General and Safety Tier members to reflect slightly later retirement. We recommend decreasing the reciprocity assumptions for General members. In addition, we recommend decreasing the spouse age difference assumption for female retirees.

Mortality Rates - The probability of dying at each age. Mortality rates are used to project life expectancies.
Recommendation: We used experience for a six-year period including both the current and the prior experience study periods to study this assumption. In addition, we included a somewhat larger margin under the current "static" approach for anticipating future mortality improvements to partially reflect the anticipated effect of any future recommendation to use a "generational" approach for anticipating future mortality improvement.

For healthy retirees, we have adjusted post-retirement mortality rates for non-disabled General and Safety members as developed in Section IV (B) to anticipate future mortality improvement. For General retirees and all beneficiaries,[1] we are recommending about a one-year improvement in assumed life expectancy. For Safety retirees, we are recommending about two to three-year improvement in assumed life expectancy.

[1] In the prior experience study, we combined the mortality experience of the Safety beneficiaries with the Safety members in recommending the life expectancy of the Safety members. In this study we recommend combining the mortality experience of all (both General and Safety) beneficiaries with that of the General members. This change has relatively little impact in studying the life expectancy for either General or Safety members.

For disabled retirees, we have adjusted mortality rates for disabled General and Safety members as developed in Section IV (C) to anticipate about a one-year improvement for General retirees, and three to four-year improvement for Safety retirees.

We recommend adjusting the rates for the pre-retirement mortality assumptions for General and Safety members as developed in Section IV (B). In addition, we recommend that all pre-retirement deaths be assumed as non-service connected deaths for General and service connected deaths for Safety.

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

Recommendation: We recommend combining the General male and General female termination rates and adjusting those rates to those developed in Section IV (D) to reflect lower incidence of termination for both General and Safety members. In addition, under the recommended assumptions, a slightly higher proportion of members is expected to elect a refund of member contributions with a correspondingly lower proportion expected to elect receiving a deferred vested benefit, as compared to the current assumptions.

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

Recommendation: We recommend combining the General male and General female disability rates and adjusting those rates to those developed in Section IV (E). The rates have been slightly modified for both non-service connected disability (non-duty) and service connected disability (duty) to more accurately reflect past experience. Overall, the proposed assumptions predict a higher number of Safety non-service connected disabilities, lower number of General non-service connected disabilities and lower number of service-connected disabilities for both General and Safety members.

Individual Salary Increases - Increases in the salary of a member between the date of the valuation to the date of separation from active service.

Recommendation: We recommend increasing the merit and promotional rates of salary increase in the earlier years of employment to those developed in Section IV (F) including extending the period of non-level salary increases from the first 5 years to the first 15 years of employment for both General and Safety members, while maintaining the ultimate salary increase rates, all to reflect current experience.

Sick Leave Conversion - Additional service that is expected to be received when the member retires due to conversion of unused sick leave.

Recommendation: We recommend maintaining the current assumptions to reflect the actual service converted from unused sick leave for retirees retired during 2014/2015 as developed in Section IV (G).

Premium Pay Assumptions - Assumptions to increase the salary to account for "other premium pay elements" not reflected in the individual annualized hourly rates.

Recommendation: We recommend separating the premium pay assumptions for members in the legacy tiers and CalPEPRA tiers (i.e., Tier C) as developed in Section IV (G).

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 is found in Section III for the economic assumptions and in Section IV for the demographic assumptions.

Section V shows the estimated cost impact of the recommended assumption for the June 30, 2016 valuation.

II. BACKGROUND AND METHODOLOGY

In this report, we analyzed both the economic and the 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 real "across the board" pay increases that are assumed.

The setting of these 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 credence 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. The setting of these assumptions is described in Section IV.

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 2015

(U.S. City Average - All Urban Consumers)

	25th Percentile	Median	75th Percentile
15-year moving averages	2.5%	3.4%	4.6%
30-year moving averages	3.1%	4.1%	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 more recent 15-year averages are lower as they do not include the high inflation years of the mid-1970s and early 1980s.

For 2015, the public fund survey published by the National Association of State Retirement Administrators (NASRA) no longer contains the distribution of the inflation assumptions used by the responding retirement systems included in their survey. We contacted the NASRA staff and we were able to obtain the inflation assumptions used by 76 large public retirement funds in their 2014 valuations. The median value of those inflation assumption is 3.00%. In California, CalPERS, Marin County and Contra Costa County use an inflation assumption of 2.75% while CalSTRS, LACERA, OCERS and eight other 1937 Act CERL systems (including SDCERA) use an inflation assumption of 3.00%.

SDCERA's investment consultant, Verus, anticipates an annual inflation rate of 2.00%. 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. The average inflation rate used by a sample of eight investment advisory firms is 2.44%.

To find a forecast of inflation based on a longer time horizon, we referred to the 2015 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 2.70%. We also compared the yields on the thirty-year inflation indexed U. S. Treasury bonds to comparable traditional U. S. Treasury bonds. As of March 2016, the difference in yields is about 1.69%, which provides a current measure of market expectations of inflation.

Based on all of the above information, we recommend maintaining the current 3.00% annual inflation assumption for the June 30, 2016 actuarial valuation.

Retiree Cost-of-Living Increases

For members in Tier 1 or Tier A, we recommend maintaining the 3.0% assumption currently used to project the maximum 3% post-retirement COLA benefit for the June 30, 2016 actuarial valuation. For members in either Tier B or Tier C, we recommend maintaining the 2.0% assumption currently used to project the maximum 2% post-retirement COLA benefit for the June 30, 2016 actuarial valuation.

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 3.00% 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 association's portfolio will vary with the Board's asset allocation among asset classes.

Following is SDCERA's current target asset allocation and the assumed real rate of return assumptions by asset class. The first column of real rate of return assumptions are determined by reducing Verus' total or "nominal" 2016 return assumptions by their assumed 2.00% inflation rate. The second column of returns (except for Value Added Real Estate, Hedge Fund, Private Real Asset and Private Equity) represents the average of a sample of real rate of return assumptions, where each firm's assumed nominal returns have been reduced by that firm's assumed inflation rate. The sample includes the expected annual real rates of return provided to us by Verus and by seven other investment advisory firms retained by Segal's California public sector retirement clients. We believe these averages are a reasonable consensus forecast of long term future market returns in excess of inflation.[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 assumptions is shorter than the time horizon we use for the actuarial valuation.

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

Asset Class	Percentage of Portfolio	Verus' Assumed Real Rate of Return[1]	Average Real Rate of Return from a Sample of Consultants to Segal's California Public Sector Clients[2]
Large Cap U.S. Equity[3][4]	17.685%	5.00%	5.80%
Small Cap U.S. Equity[3][4]	1.965%	5.00%	6.47%
Developed International Equity[4]	16.200%	8.80%	6.97%
Emerging Markets Equity[4]	9.150%	11.60%	8.93%
U.S. Core Bonds	10.000%	1.30%	0.84%
High Yield Bonds	5.000%	5.60%	3.47%
Global Bonds	2.000%	0.90%	0.49%
Bank Loan	5.000%	2.50%	2.34%
Cash & Equivalents	2.000%	0.00%	-0.46%
Real Estate[5]	4.500%	3.80%	4.45%
Value Added Real Estate[5]	4.500%	7.10%	7.10%[6]
Hedge Fund (Fund to Funds)	8.000%	4.40%	4.40%[6]
Private Real Asset[7]	6.000%	9.00%	9.00%[6]
Private Equity	8.000%	9.00%	9.00%[6]
Total Portfolio	100.000%	6.13%	5.61%

(1) *Derived by reducing Verus' nominal return assumptions by their 2.00% inflation assumption.*

(2) *These are based on the projected arithmetic real returns provided by the investment advisory firms serving the county retirement associations of San Diego, Sonoma, Alameda, Mendocino, Ventura, the LA City Employees' Retirement System, the East Bay Municipal Utility District Retirement Plan and the LA Fire & Police Pensions. These return assumptions are gross of any applicable investment expenses.*

(3) *An allocation of 18% U.S. Equity includes 16.2% Large Cap U.S. Equity and 1.8% Small Cap U.S. Equity.*

(4) *An allocation of 3% Global Equity includes Large Cap U.S. Equity, Small Cap U.S. Equity, Developed International Equity and Emerging Markets Equity at the ratios in the table below as provided by SDCERA:*

	Ratio	*Percent Allocation*
Large Cap U.S. Equity	*0.4950*	*1.485%*
Small Cap U.S. Equity	*0.0550*	*0.165%*
Developed International Equity	*0.4000*	*1.200%*
Emerging Markets Equity	*0.0500*	*0.150%*
Total	*1.0000*	*3.000%*

(5) *Per SDCERA, an allocation of 9% Real Estate is split equally between (Core) Real Estate and Value Added Real Estate.*

(6) *For these asset classes, the Verus assumption is applied in lieu of an average because there is a larger disparity in returns for these asset classes among firms surveyed and because using Verus' assumption should more closely reflect the underlying investments made specifically for SDCERA.*

(7) *Per SDCERA, for this asset class we used the return assumption provided by Verus for Private Equity.*

The above are representative of "indexed" returns and do not include any additional returns ("alpha") from active management. This is consistent with the Actuarial Standard of Practice (ASOP) No. 27, Section 3.8.3.d, which states:

> "Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (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 believe, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period."

The following are some observations and our conclusions from the above analysis:

1. The investment consultants to our California public sector 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 a sample average of expected real rates of return allows SDCERA's investment return assumption to reflect a broader range of capital market information and should help reduce year to year volatility in SDCERA's investment return assumption.

3. Therefore, we recommend that the 5.61% portfolio real rate of return be used to determine SDCERA's investment return assumption. After adjusting for the cost of leverage, this is 0.15% lower than the return that was used three years ago to develop the recommended investment return assumption for the June 30, 2013 valuation. The difference is due to changes in SDCERA's target asset allocation (+0.02%), changes in the real rate of return assumptions provided to us by the investment advisory firms (-0.18%) and the effect of the interaction between those two changes[3] (+0.01%).

Association Expenses

For funding purposes (and for financial reporting), the real rate of return assumption for the portfolio needs to be adjusted for investment expenses to be paid from investment income. As further discussed later in this report, current practice for SDCERA also adjusts for expected administrative expenses. The

[3] This includes the joint effect of the changes in SDCERA's target asset allocation and the changes in the average real rate of return assumptions for each asset category as provided to us by the investment advisory firms.

following table provides these expenses in relation to the actuarial value of assets for the five years ending June 30, 2015.

Administrative and Investment Expenses as a Percentage of Actuarial Value of Assets (All dollars in 000's)

Year Ending June 30	Actuarial Value of Assets*	Administrative Expenses	Investment Expenses**	Administrative %	Investment %	Total %
2011	$8,568,142	$10,514	$89,142	0.12%	1.04%	1.16%
2012	8,650,728	10,866	86,091	0.13%	1.00%	1.13%
2013	8,691,074	11,454	92,276	0.13%	1.06%	1.19%
2014	9,242,141	12,709	104,259	0.14%	1.13%	1.27%
2015	9,899,962	14,043	112,228	0.14%	1.13%	1.27%
Average				0.13%	1.07%	1.20%

* *As of beginning of plan year.*

** *Excludes securities lending expenses. Because we do not assume any additional net return for this program, we effectively assume that any securities lending expenses will be offset by related income.*

In addition, it is our understanding that there will be some savings on investment expenses resulting from the conversion from Outsourced CIO to In-House Investment Program. The following table summarized the projected savings, as estimated by SDCERA.

SDCERA Projected Investment Expenses Savings (All dollars in 000's)

Category	2014/2015 Amount	SDCERA Projected Expenses	SDCERA Projected Saving
OCIO and External Investment Managers	$104,528	$89,900	$14,628
Investment Consultants	1,568	1,080	488
Custodian, Actuary, Administrative and Support Staff	6,132	6,132	0
Total	$112,228	$97,112	$15,116

The average expense percentage over this five year period is 1.20%. Based on this experience, we would increase the future expense assumption from the 1.00% used in our review for the June 30, 2013 valuation to 1.20%. Furthermore, based on the conversion from Outsourced CIO to In-House Investment Program and the estimated projected savings in expenses as provided by SDCERA, we believe it is reasonable to assume that the 1.20% expense assumption will be offset by 0.15% in projected saving (calculated by taking $15.1 million in projected savings and dividing it by $9,899,962,000 actuarial value of assets at the beginning of 2014/2015). This assumption will be re-examined in subsequent assumption reviews as new data becomes available.

Note related to investment expenses paid for active asset management – As cited above under Section 3.8.3.d of ASOP No. 27, the effect of an active investment management strategy should be considered

"net of investment expenses…unless the actuary believes, based on relevant data, that such superior or inferior returns represent a reasonable expectation over the measurement period."

We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns ("alpha") earned by that active management. We do not believe that such a review would have a significant impact on the recommended investment return assumption developed using the above expense assumption. For now, we will continue to use the current approach of treating any "alpha" that may be identified as an implicit increase in the risk adjustment and corresponding confidence level in developing the investment return assumption rather than as an explicit offset to any related active management expenses.[4] For example, 0.25% of alpha would increase the confidence level by 3% (see discussions that follow on definitions of risk adjustment and confidence level).

Approaches to Account for Administrative Expenses in Developing Investment Return Assumption for use in the Funding Valuation and the Financial Reporting Valuation.

As noted above, SDCERA's investment return assumption has historically been developed net of both investment and administrative expenses. In a letter dated August 20, 2014 Segal brought to the Board's attention a new discrepancy between valuations for funding and for financial reporting. Briefly, GASB Statements 67 and 68 require that the investment return assumption for financial reporting be developed gross, not net, of administrative expenses. Under this approach administrative expenses are accounted for explicitly as an outflow of assets, rather than implicitly as a reduction in investment return. In September 2014, as recommended by Segal, the Board adopted a practice of assuming for financial reporting the same rate of investment return as used for funding (at that time 7.75%) but to treat that rate as gross of administrative expenses for financial reporting.

As part of that same discussion Segal also presented to the Board an alternative approach of using for the funding valuation the same "explicit" treatment of administrative expenses as used in the financial reporting valuation required by GASB. We presented that for consideration as a more transparent treatment of administrative expenses but noted that it would require an explicit "loading" on contributions from both the employer and the members that would total about 1.0% of payroll. The Board chose to

---

4 As noted earlier, Actuarial Standard of Practice (ASOP) No. 27, Section 3.8.3.d states "Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (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 believe, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period." (emphasis added). We believe this means that assuming only enough superior return to cover related investment expenses would not require the relevant supporting data referenced in ASOP No. 27.

continue the current practice of "implicit" treatment of administrative expenses by developing the investment return assumption net of the administrative expenses.

Risk Adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. SDCERA's asset allocation 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. The 5.61% 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 somewhat above the 50% level. This is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.[5]

Three years ago in the last full review of the economic assumptions, the Board adopted an investment return assumption of 7.75%. That return implied a risk adjustment of 0.26%, reflecting a confidence level of 53% that the actual average 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[6]. While the interim study conducted before the June 30, 2015 valuation lowered the investment return assumption from 7.75% to 7.50%, that decrease was made to reflect a reduction in the inflation assumption from 3.25% to 3.00%. The risk adjustment and the confidence level remained unchanged at 0.26% and 53%, respectively.

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

---

5 Note that for investment return assumptions recently adopted by systems that have been analyzed under this model, the confidence levels are generally in the range of 51% to 55%. We also note a trend towards lower confidence levels (closer to 50%) over the last several years.

6 Based on an annual portfolio return standard deviation of 11.28% provided by SDCERA's prior investment consultant in 2013. Strictly speaking, future compounded 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.

level of 60%, then there would be 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 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 53% confidence level from our last full study to set this year's risk adjustment, based on the current long-term portfolio standard deviation of 11.72% provided by Verus, the corresponding risk adjustment would be 0.27%. Together with the other investment return components, this would result in an investment return assumption of 7.29%, which is lower than the current assumption of 7.50%.

Based on the general practice of using one-quarter percentage point increments for economic assumptions, we evaluated the effect on the confidence level of other alternative investment return assumptions. In particular, a net investment return assumption of 7.25%, together with the other investment return components, would produce a risk adjustment of 0.31%, which corresponds to a confidence level of 54%. This is slightly higher than the confidence level of 53% used in SDCERA's last full study for the June 30, 2013 valuation. We believe this analysis supports reducing the current assumption of 7.50% to 7.25%.

The table below shows SDCERA's investment return assumptions and, for the years when an analysis was performed, the risk adjustments and corresponding confidence levels as determined in those prior studies.

Historical Investment Return Assumptions, Risk Adjustments and Confidence Levels Based on Assumptions Adopted by the Board

Year Ending June 30	Investment Return	Risk Adjustment	Corresponding Confidence Level
2010 - 2012	8.00%	0.33%	55%
2013 – 2014	7.75%	0.26%	53%
2015 (Interim Study)	7.50%	0.26%	53%
2016 (Recommended)	7.25%	0.31%	54%

As we have discussed in prior years, the risk adjustment model and associated confidence level is most useful as a means for comparing how SDCERA has positioned themselves over periods of time[7]. The use of the 54% confidence level should be considered in context with other factors, including:

[7] 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."

- 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.

- The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by Verus. 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.

- A confidence level of 54% (which is associated with a 7.25% investment return assumption) is still within the range of 51% to 55% as determined for most of Segal's other California public retirement system clients under this risk adjustment model.

- 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.

- As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the later section on "Comparison with Other Public Retirement Systems".

Taking into account the factors above, our recommendation is to reduce the net investment return assumption from 7.50% to 7.25%. As noted above, this return implies a 0.31% risk adjustment, reflecting a confidence level of 54% that the actual average return over 15 years would not fall below the assumed return.

Recommended Investment Return Assumption

The following table summarizes the components of the investment return assumption developed in the previous discussion. For comparison purposes, we have also included similar values from the last full and interim studies.

Calculation of Net Investment Return Assumption

Assumption Component	June 30, 2016 Recommended Value	June 30, 2015 Interim Study Adopted Value	June 30, 2013 Full Study Adopted Value
Inflation	3.00%	3.00%	3.25%
Plus Portfolio Real Rate of Return	5.61%	N/C*	5.78%
Cost of Leverage	N/A	N/C*	(0.02%)
Minus Expense Adjustment	(1.20%)	N/C*	(1.00%)
Plus Projected Savings of Future Investment Expenses	0.15%	N/C*	N/A
Minus Risk Adjustment	(0.31%)	N/C*	(0.26%)
Total	7.25%	7.50%	7.75%
Confidence Level	54%	N/C*	53%

** The June 30, 2015 interim study only reviewed the inflation assumption. Other components of the investment return assumption remained unchanged as the June 30, 2013 full study.*

Based on this calculation, we recommend that the investment return assumption be decreased from 7.50% to 7.25% per annum.

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 7.25% is one of most common investment return assumptions among those California public sector retirement systems. In particular, the 7.25% assumption is used by six county employees retirement systems. To our knowledge, there are only two California county employees retirement systems which have recently adopted a 7.00% investment return assumption.

The following table compares the SDCERA recommended net investment return assumptions against those of the nationwide public retirement systems that participated in the NASRA 2015 Public Fund Survey for 125 large public retirement funds in their 2014 valuations:

Assumption	**SDCERA**	**NASRA 2015 Public Fund Survey**		
		Low	Median	High
Net Investment Return	7.25%	6.50%	7.75%	8.50%

The detailed survey results show that more than one-half of the systems that have an investment return assumption in the range of 6.75% to 7.75%. 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 less frequently and so may lag behind emerging practices in this area.

In summary, we believe that both the risk adjustment model and other considerations indicate a lower earnings assumption. The recommended assumption of 7.25% continues to provide for similar risk margin within the risk adjustment model as compared to the last study and is consistent with SDCERA's current practice relative to other public systems.

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 contribution rates. 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 will require an employer to maintain its members' standards of living.

   As discussed earlier in this report, we are recommending that the assumed rate of inflation be maintained at 3.00%. This inflation component is used as part of the salary increase assumption.

2. Real "Across the Board" Pay Increases – These increases are sometimes 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 0.6% - 0.9% 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 July 2015. In that report, real "across the board" pay increases are forecast to be 1.2% per year under the intermediate assumptions.

   The real pay increase assumption is generally considered a more "macroeconomic" assumption, that is not necessarily based on individual plan experience. However, recent salary experience with public systems in California as well as anecdotal discussions with plans and plan sponsors indicate lower future real wage growth expectations for public sector employees. The following table compares actual changes in average salaries for SDCERA members with actual price inflation as measured by changes in the CPI.

Valuation Date	SDCERA Actual Change in Average Salary	Actual Change in CPI[(1)]
June 30, 2011	2.3%	3.0%
June 30, 2012	-0.7%[(2)]	1.6%
June 30, 2013	-1.0%	1.3%
June 30, 2014	1.7%	1.9%
June 30, 2015	2.6%	1.6%
Average	1.0%	1.9%

(1) *Based on the change in the annual average CPI for the San Diego area compared to the prior year.*

(2) *The 0.7% decrease in average salary from the one-year period ending June 30, 2012 is adjusted to remove the effect of the change in "pay for performance" assumption.*

The actual average inflation plus "across the board" increase (i.e., wage inflation) over the past five years was about 1.0%.

Considering all these factors, we recommend reducing the real "across the board" salary increase assumption from 0.75% to 0.50%. This means that the combined inflation and "across the board" salary increase assumption will decrease from 3.75% to 3.50%.

3. Individual Merit and Promotional Increases – As the name implies, these increases come from a member's career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For SDCERA, there are service-specific merit and promotional increases. These assumptions have been reviewed as part of our triennial experience study as of June 30, 2015.

   Recommended merit and promotional assumptions are provided in Section IV (F) of this report.

All three of these forces are incorporated into a salary increase assumption that is applied in the actuarial valuation to project future benefits and future Normal Cost contribution collections.

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 is assumed to increase only by inflation and real "across the board" pay increases. The merit and promotional increases are not an influence, because this average pay is not specific to an individual.

For the June 30, 2016 valuation, we recommend that the active member payroll increase assumption be reduced from 3.75% to 3.50% 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 from service (i.e., who did not retire on a disability pension) 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.

The tables on the following pages show the observed service (non-disability) retirement rates for General Tiers 1 and A and Safety Tier A members based on the actual experience over the past three years. The observed service retirement rates were determined by comparing those members who actually retired from service to those eligible to retire from service. This same methodology is followed throughout this report and was described in Section II. Also shown are the current rates assumed and the rates we propose.

The following rates are the current, observed and proposed rates for General Tier 1 and Tier A from July 1, 2012 to June 30, 2015:

General Tier 1 and Tier A

Rate (%)

Age	Current Rate of Retirement	Observed Rate of Retirement	Proposed Rate of Retirement
49*	55.0	87.5	65.0
50	7.0	5.1	6.0
51	5.0	2.9	4.0
52	5.0	3.2	4.0
53	5.0	4.7	5.0
54	6.0	5.2	6.0
55	11.0	8.4	10.0
56	11.0	7.5	10.0
57	11.0	8.4	10.0
58	12.0	9.6	11.0
59	15.0	14.4	15.0
60	20.0	15.9	18.0
61	20.0	19.6	20.0
62	24.0	23.4	23.0
63	25.0	16.9	24.0
64	28.0	21.8	25.0
65	31.0	28.1	31.0
66	31.0	37.1	35.0
67	31.0	32.3	33.0
68	35.0	22.7	32.0
69	37.0	29.3	31.0
70	50.0	24.2	35.0
71	50.0	13.6	35.0
72	50.0	17.7	35.0
73	50.0	25.0	35.0
74	50.0	34.8	40.0
75+	100.0	31.4	100.0

* *These rates are applicable to General members with 30 or more years of service.*

The following are the current, observed and proposed rates of retirement for Safety Tier A from July 1, 2012 to June 30, 2015:

Safety Tier A
Rate (%)

Age	Current Rate of Retirement	Observed Rate of Retirement	Proposed Rate of Retirement
Under 45*	-	3.8**	-
45*	-	2.8**	2.0
46*	-	2.1**	2.0
47*	-	3.0**	2.0
48*	4.0	2.6	3.0
49*	8.0	10.7	9.0
50	14.0	14.3	14.0
51	12.0	12.6	12.0
52	12.0	8.7	11.0
53	15.0	16.5	15.0
54	15.0	15.3	15.0
55	16.0	8.2	15.0
56	18.0	21.0	18.0
57	20.0	16.5	18.0
58	21.0	19.1	19.0
59	22.0	14.3	20.0
60	25.0	18.0	22.0
61	30.0	15.6	25.0
62	30.0	21.1	25.0
63	30.0	20.0	25.0
64	30.0	18.8	25.0
65	60.0	40.0	50.0
66	60.0	40.0	50.0
67	60.0	33.3	50.0
68	60.0	33.3	50.0
69	60.0	50.0	50.0
70+	100.0	100.0	100.0

* *These rates are applicable to Safety members with 20 or more years of service.*
** *No actual retirements were reported at this age in the last experience study.*

As you can see from our proposed rates, except for General members at ages 49, 66, and 67, and for Safety members prior to age 50, we anticipate that both General Tier 1 and Tier A members and Safety Tier A members will retire slightly later than under the current assumptions.

On August 28, 2009 and January 1, 2013 the employer implemented new Tier B and Tier C formulas, respectively, for General and Safety. For those new tiers, we do not have credible experience from the past three years to propose new rates based on actual retirement from members of those tiers. However, we are recommending lowering some of the rates currently used for those tiers commensurate with the later retirement assumptions that we are recommending for the General Tier 1 and Tier A and Safety Tier A members. This is because the retirement rates for General and Safety Tiers B and C were partially developed based on the then current Tier A retirement rates when those new tiers were first established.

The following are the current and proposed rates of retirement for Tier B members:

General Tier B and Safety Tier B

Rate (%)

Age	Current General (Tier B)	Proposed General (Tier B)	Current Safety (Tier B)	Proposed Safety (Tier B)
45	-	-	-	2.0
46	-	-	-	2.0
47	-	-	-	2.0
48	-	-	3.0	3.0
49	-	-	3.5	3.5
50	-	-	11.0	11.0
51	-	-	11.0	11.0
52	-	-	11.0	10.0
53	-	-	11.0	11.0
54	-	-	12.0	12.0
55	5.5	5.0	19.0	19.0
56	6.5	6.0	22.0	22.0
57	7.5	7.0	20.0	20.0
58	7.5	7.0	21.0	20.0
59	7.5	7.0	22.0	20.0
60	10.0	9.0	25.0	22.0
61	13.0	13.0	30.0	25.0
62	19.0	19.0	30.0	25.0
63	19.0	19.0	30.0	25.0
64	19.0	19.0	30.0	25.0
65	30.0	30.0	60.0	50.0
66	30.0	30.0	60.0	50.0
67	30.0	30.0	60.0	50.0
68	30.0	30.0	60.0	50.0
69	30.0	30.0	60.0	50.0
70	50.0	35.0	100.0	100.0
71	50.0	35.0	100.0	100.0
72	50.0	35.0	100.0	100.0
73	50.0	35.0	100.0	100.0
74	50.0	40.0	100.0	100.0
75+	100.0	100.0	100.0	100.0

The following are the current and proposed rates of retirement for Tier C members:

General Tier C and Safety Tier C

Rate (%)

Age	Current General (Tier C)	Proposed General (Tier C)	Current Safety (Tier C)	Proposed Safety (Tier C)
50	-	-	14.0	14.0
51	-	-	9.5	9.5
52	-	-	9.5	9.5
53	-	-	9.5	9.5
54	-	-	10.5	10.5
55	4.0	4.0	16.5	16.5
56	4.5	4.5	19.0	19.0
57	5.5	5.5	20.0	20.0
58	5.5	5.5	21.0	20.0
59	5.5	5.5	22.0	22.0
60	7.5	7.0	25.0	22.0
61	10.0	10.0	30.0	25.0
62	14.0	14.0	30.0	25.0
63	15.0	15.0	30.0	25.0
64	16.0	15.0	30.0	25.0
65	26.0	26.0	60.0	50.0
66	30.0	30.0	60.0	50.0
67	30.0	30.0	60.0	50.0
68	30.0	30.0	60.0	50.0
69	30.0	30.0	60.0	50.0
70	50.0	35.0	100.0	100.0
71	50.0	35.0	100.0	100.0
72	50.0	35.0	100.0	100.0
73	50.0	35.0	100.0	100.0
74	50.0	40.0	100.0	100.0
75+	100.0	100.0	100.0	100.0

Chart 1 compares actual experience with the assumed and proposed rates of retirement for General Tier 1 and Tier A members. Chart 2 has the same data for Safety Tier A members.

Chart 3 compares the assumed and proposed rates of retirement for General Tier B. Chart 4 has the same data for Safety Tier B members.

Chart 5 compares the assumed and proposed rates of retirement for General Tier C. Chart 6 has the same data for Safety Tier C members.

Deferred Vested Members

In prior valuations, deferred vested General and Safety members were assumed to retire at age 57 and 51, respectively. The average age at retirement over the prior three years was 57.2 for General and 50.6 for Safety. As a result, we recommend maintaining 57 as the retirement age assumption for deferred vested General members and maintaining 51 as the retirement age assumption for deferred vested Safety members.

Reciprocity

It is also currently assumed that 25% of inactive General and 30% of inactive Safety deferred vested participants would be covered under a reciprocal retirement system and receive 4.50% and 4.75% annual salary increases for General and Safety members, respectively, from termination until their date of retirement. By combining the snapshot experiences as of June 30, 2013, 2014 and 2015, the actual experience indicated that 20% of General and 31% of Safety members went on to be covered by a reciprocal retirement system. Therefore, we recommend modifying the reciprocal assumption to 20% for General members, and maintaining 30% as the reciprocal assumption for Safety members.

In addition, we recommend 4.25% and 4.50% salary increase assumptions for General and Safety members, respectively, be utilized to anticipate salary increases from the date of termination from SDCERA to the expected date of retirement for participants in a reciprocal retirement system. These assumptions are based on the ultimate 0.75% and 1.00% merit and promotional salary increase assumptions for General and Safety members, respectively, together with the 3.00% inflation and 0.50% "across the board" salary increase assumptions that are recommended in Section III of this report.

Survivor Continuance under the Unmodified Option

In prior valuations, it was assumed that 75% of all active male members and 55% of all active female members would be married or have an eligible domestic partner when they retired. According to experience of members who retired during the last three years, about 72% of all male members and 52% of all female members were married or had a domestic partner at retirement. We recommend maintaining the current marriage assumptions of 75% for male members and 55% for female members.

Since the value of the survivor's benefit is dependent on the survivor's age and sex, we must also have assumptions for the age and sex of the survivor. Based on the experience during the three-year period and studies done for other retirement systems, we recommend the following:

1. Since most of the survivors are actually of the opposite sex, even with the inclusion of domestic partners, we will continue to assume that the survivor's sex is the opposite of the member.

2. The current and recommended assumptions for the age of the survivor are shown below. These assumptions will continue to be monitored in future experience studies.

	Survivor's Age as Compared to Member's Age		
Beneficiary Sex	**Current Assumption**	**Actual Experience**	**Recommended Assumption**
Male	3 years older	1.09 years older	2 years older
Female	3 years younger	2.78 years younger	3 years younger

Chart 1
Retirement Rates - General Tier 1 and Tier A Members

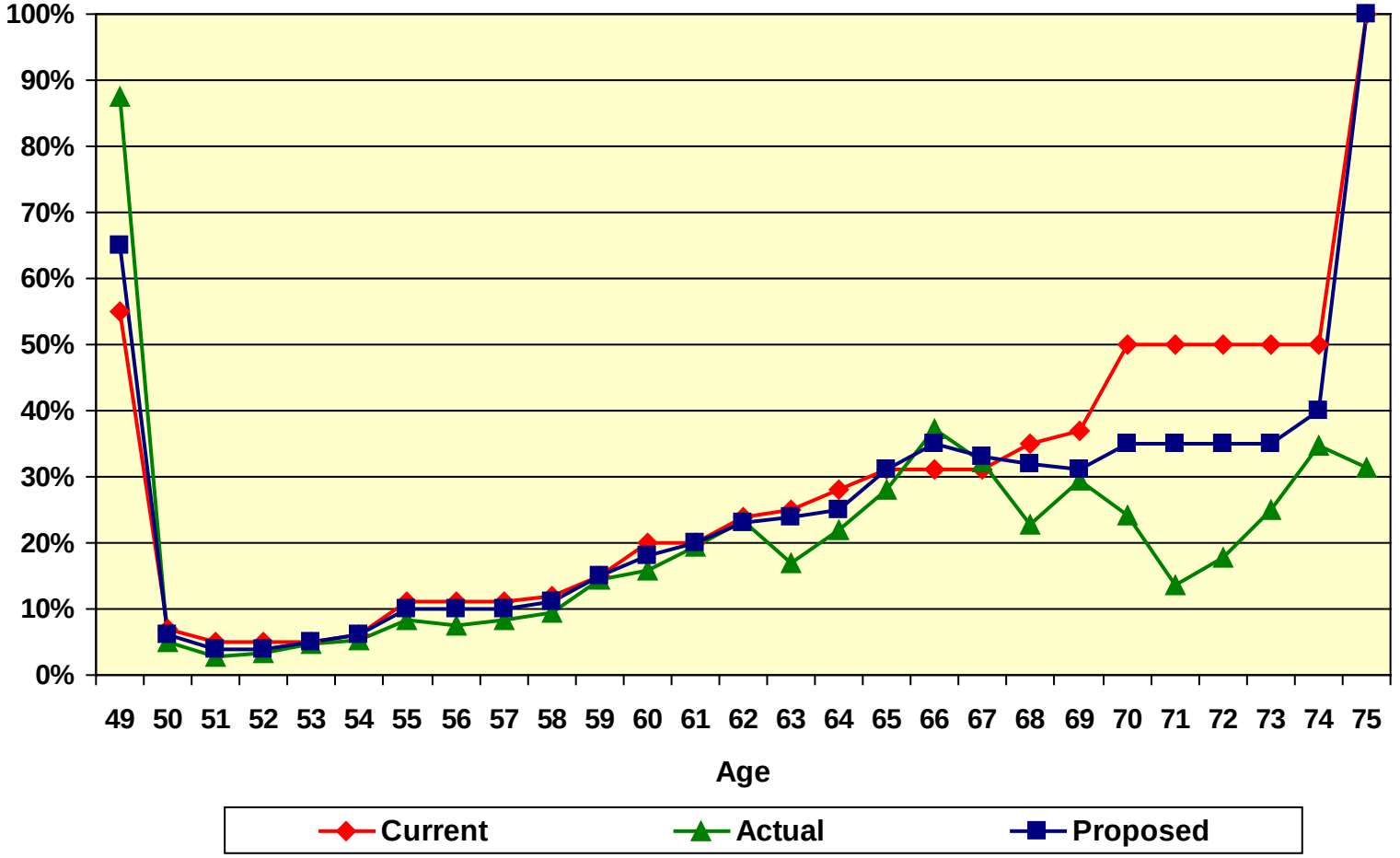


Chart 2
Retirement Rates - Safety Tier A Members

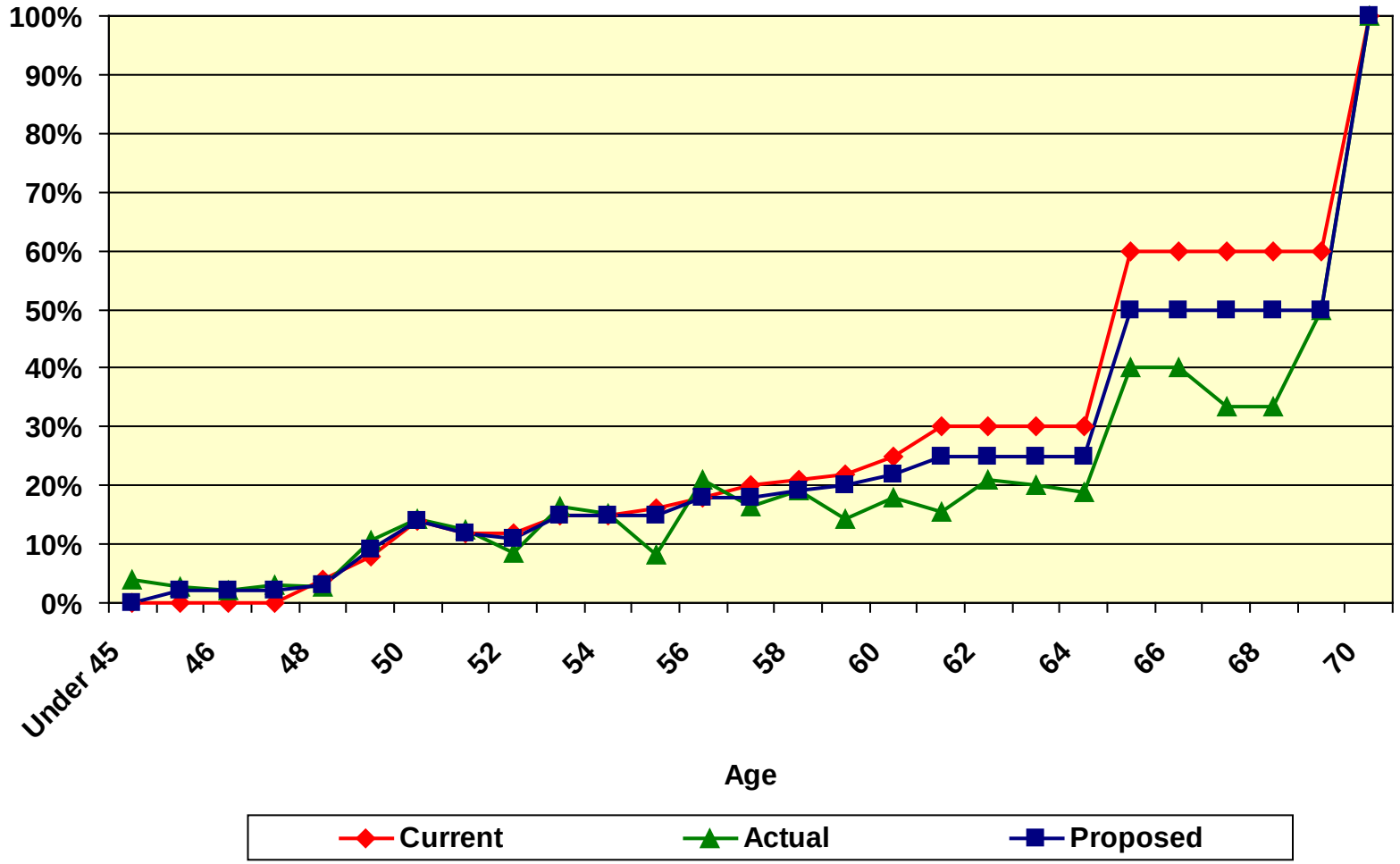


Chart 3
Retirement Rates - General Tier B Members

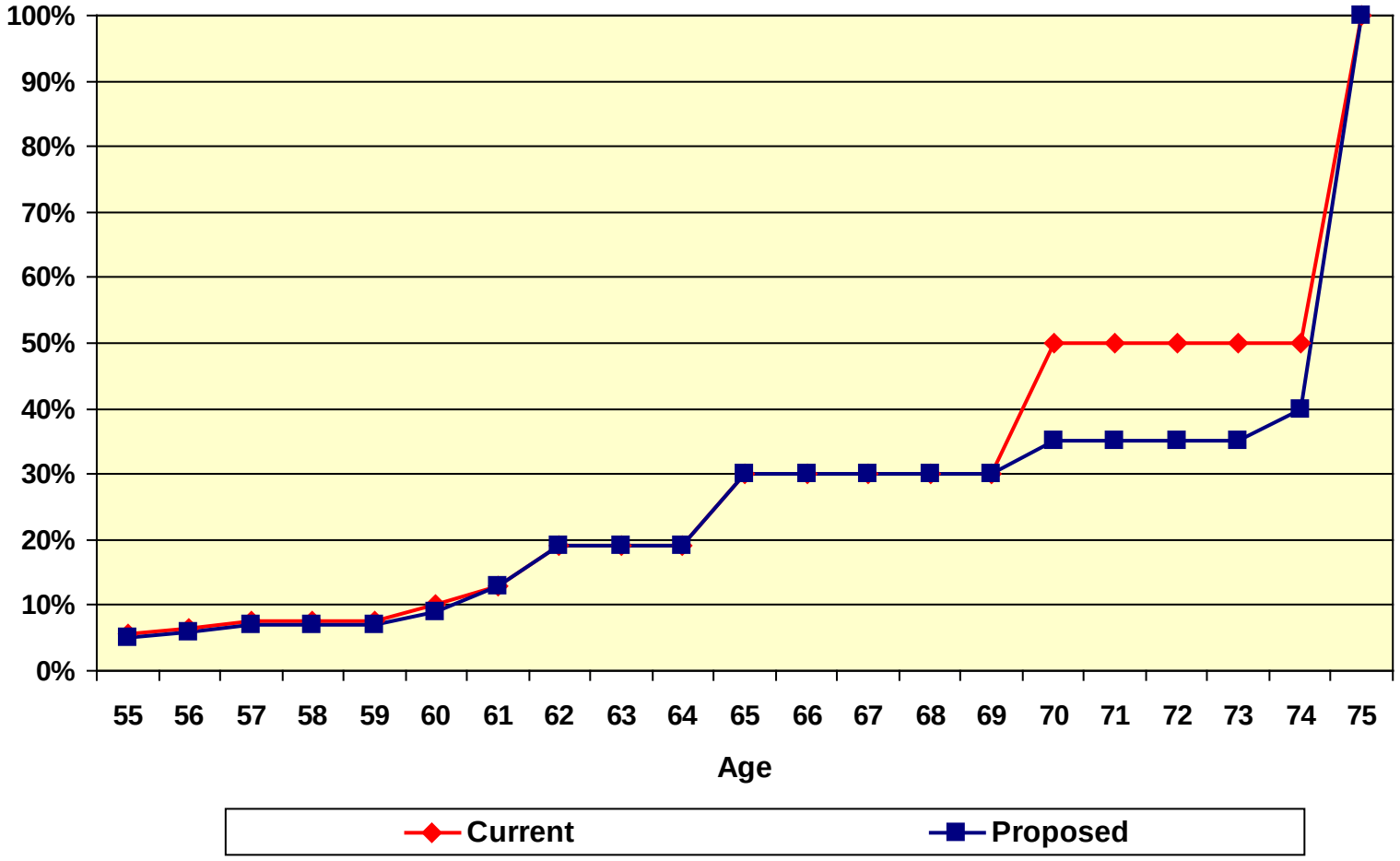


Chart 4
Retirement Rates - Safety Tier B Members

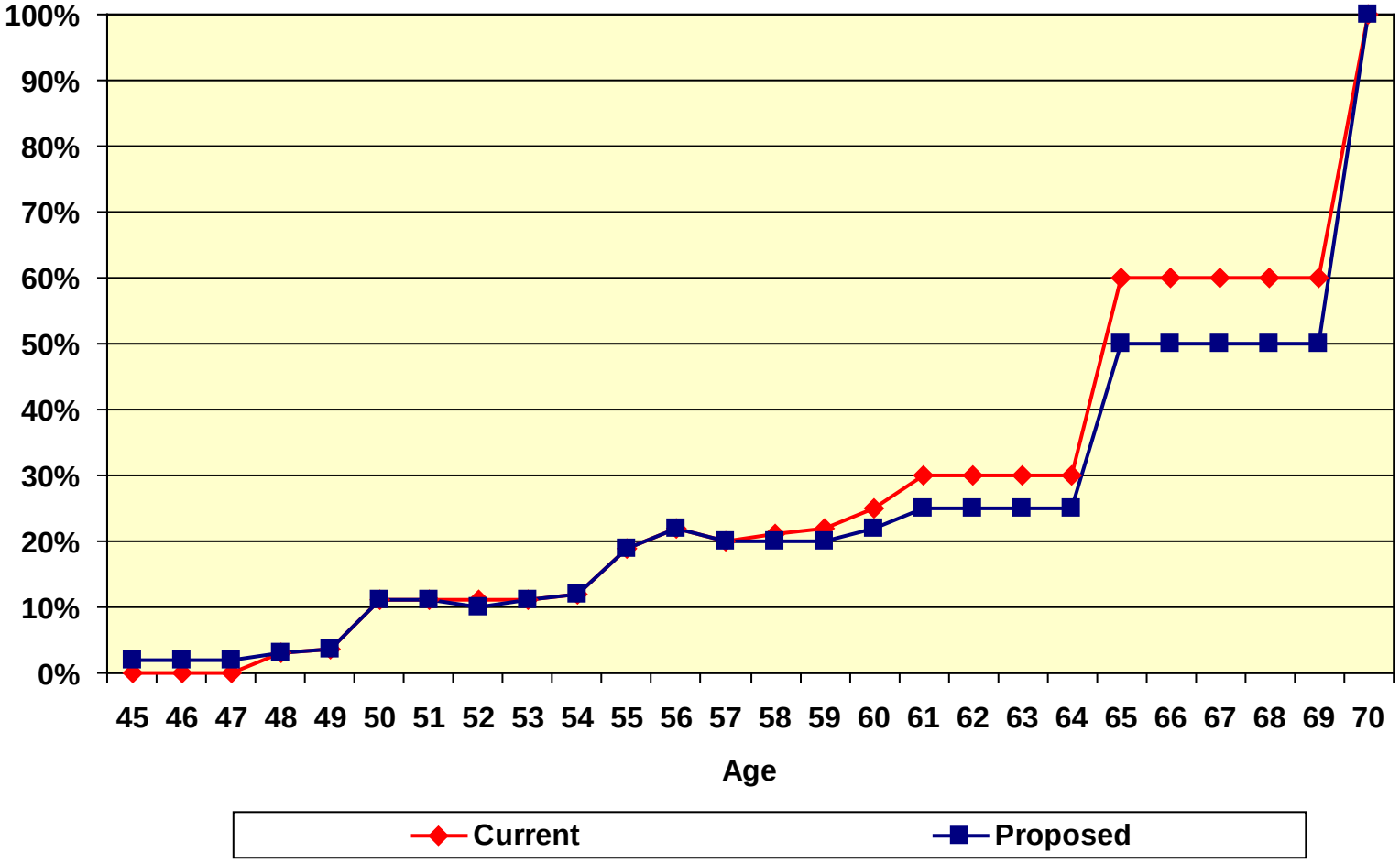


Chart 5
Retirement Rates - General Tier C Members

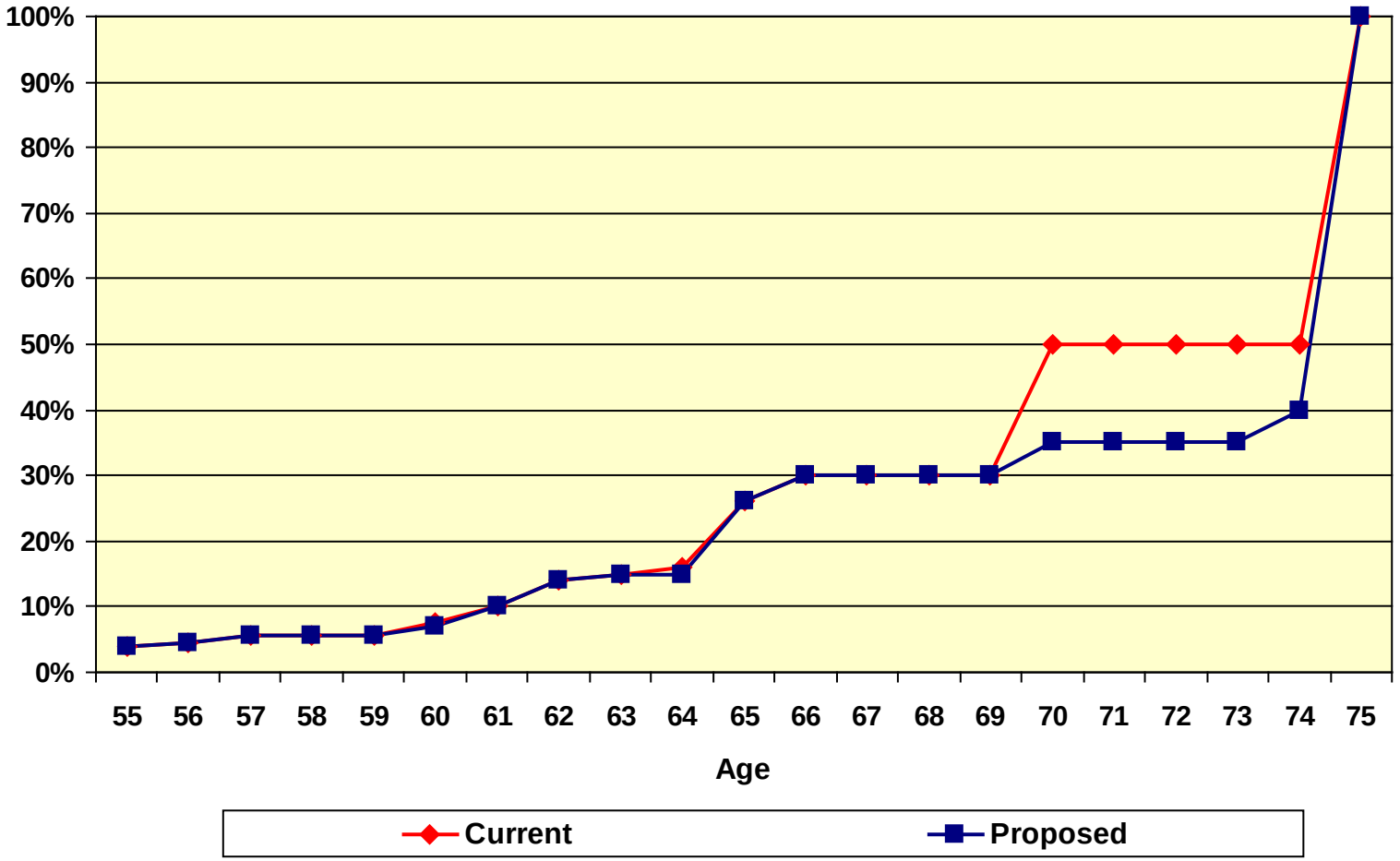
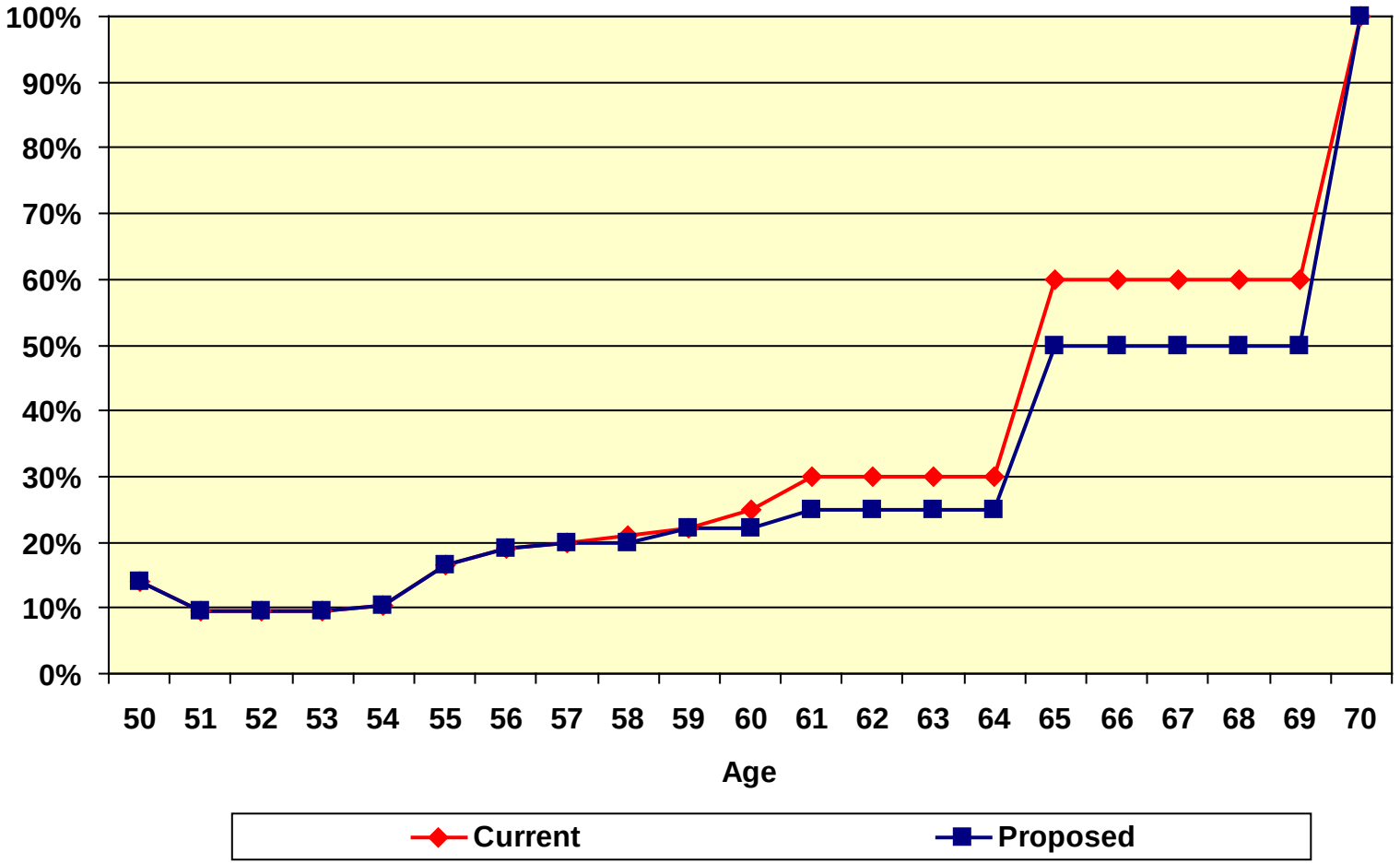


Chart 6
Retirement Rates - Safety Tier C Members



B. MORTALITY RATES - HEALTHY

The “healthy” mortality rates project the life expectancy of a member who retires from service (i.e., who did not retire on a disability pension). Also, the “healthy” pre-retirement mortality rates project what proportion of members will die before retirement. The table currently being used for post-service retirement mortality rates is the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) projected with Scale AA to 2016 with a two-year age setback for males and a one-year age setback for females for General members and beneficiaries and the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) projected with Scale AA to 2016 with a one-year age setback for males and no age setback for females for Safety members and beneficiaries

The Society of Actuaries (SOA) has recently published the RP-2014 family of mortality tables and associated life expectancy improvement scales. Within that family of mortality tables, there are mortality rates developed for annuitants on a “headcount” weighted basis that weight all retirees at the same age the same way without regard to the level of benefits those annuitants are receiving from a retirement plan. Mortality rates are also developed for annuitants on a “benefit” weighted basis, with higher credibility assigned to experience from annuitants receiving larger benefits. The headcount-weighted basis is the more common practice and is the approach used by Segal in the past for its California public system clients (including SDCERA) and by other public sector actuaries in California.

As for the life expectancy improvement scales, they can be applied in one of two ways. Currently, the more common application is to use a “static” approach to anticipate a fixed level of mortality improvement for all annuitants receiving benefits from a retirement plan. This is in contrast to a “generational” approach where each future year has its own mortality table that reflects the forecasted improvements, using the published improvement scales. The static approach is used by Segal for its California public system clients (including SDCERA) and is still most commonly used by other public sector actuaries in California and nationwide.

The SOA is in the process of collecting data from public sector plans so that they can develop mortality tables based on public sector experience comparable to the RP-2014 mortality tables developed using data collected from private and multi-employer plans. Furthermore, after publishing the two-dimensional MP-2014D life expectancy improvement scale, the SOA has replaced it with the two-dimensional MP-2015D life expectancy improvement scale to remove some of the conservatism built into the MP-2014D scale and to better reflect the most recent data of mortality improvement from the Social Security Administration.

Segal believes that given the continuing trend towards longer life expectancies, it would be prudent for the Board to adopt the Headcount-Weighted RP-2014 mortality table, adjusted for SDCERA experience. However, given that there is a large difference between the generational MP-2014D and MP-2015D, Segal recommends that SDCERA continue to use a static mortality improvement but with adjustments that would nearly double the 10% margin we have recommended in the past to anticipate the move towards a "generational" approach in a future experience study. Once the SOA has included data from public sector plans in developing the new tables, we will also include a discussion with the Board on whether to consider the benefit weighted mortality rates in the experience study.

Note that in order to use more actual SDCERA experience in our analysis, we have used experience for a six-year period from both the current and the last experience study periods to study this assumption. In addition, we have examined the mortality experience for General service retirees with all beneficiary (both General and Safety) as we believe the beneficiary experience should resemble the mortality pattern for General service retirees[8].

In the table below, we have provided the approximate increase in the total employer and member contribution rates based on the different approaches to build in margin for future mortality improvements.

	Employer and Member Impact Combined
Headcount Weighted RP-2014 – Static approach with increased margin	3.2% of payroll
Benefit Weighted RP-2014 – Static approach without increased margin	3.1% of payroll
Headcount Weighted RP-2014 – Generational approach	4.0% of payroll

Pre-Retirement Mortality

In prior experience studies, the pre-retirement mortality rates for active members were set equal to the post-retirement mortality rates for retirees since the actual number of deaths among active members was not large enough to provide a statistically creditable analysis. However, this approach is not compatible with our current proposal because the post-retirement RP-2014 Healthy Annuitant table does not include rates for ages below 50.

[8] In the prior experience study, we combined the mortality experience of the Safety beneficiaries and the Safety members in recommending the life expectancy of the Safety members. In this study we recommend combining the mortality experience of all beneficiaries with that of the General members. This change has relatively little impact in studying the life expectancy for either General or Safety members.

From the RP-2014 family of tables, we recommend that pre-retirement mortality follow the Headcount-Weighted RP-2014 Employee Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015D times 75%, all to account for the lower incidences of observed pre-retirement death on the combined General and Safety workforce. For General, all pre-retirement deaths are assumed to be non-service connected while for Safety, all pre-retirement deaths are assumed to be service connected.

Post-Retirement Mortality (Service Retirements)

Among service retired members and beneficiaries, the actual deaths compared to the expected deaths under the current and proposed assumptions for the last six years are as provided in the table below. As there have been relatively fewer deaths among Safety members when compared to General members, we have also provided for informational purposes only the ratios of actual to expected deaths for the last nine years under the current and proposed assumptions for Safety members.

	General – Healthy and All Beneficiaries			Safety – Healthy		
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths	Current Expected Deaths	Actual Deaths[9]	Proposed Expected Deaths
Male	753	799	701	94	94	78
Female	1,197	1,284	1,083	13	14	11
Total	1,950	2,083	1,784	107	108	89
Actual / Expected	107%		117%	101%		122%
Actual / Expected over 9 Yrs (for informational purposes only)				96%		115%

For General members and all beneficiaries, the ratio of actual to expected deaths under the current assumption was 107%. We recommend changing to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015D, with no age adjustment for males and set forward one year for females. This will bring the actual to expected ratio for the most recent six year period to 117% for General members and all beneficiaries.

For Safety members, the ratio of actual to expected deaths was 101%. We recommend changing to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015D, set back two years. This will bring the actual to expected rates to 122%.

9 There were 49, 59 and 29 deaths during the 2012-2015, 2009-2012 and 2006-2009 periods, respectively, for an average of 46 deaths for each 3-year period.

Note that the margin for General members under proposed assumptions is smaller when compared to the Safety members. However, the margins for both General and Safety will be about the same when we combine the healthy General and Safety mortality experience with the corresponding disabled mortality experiences discussed in the next section.

Chart 7 compares actual to expected deaths for General members and all beneficiaries under the current and the proposed assumptions over the last six years. Experience shows that there were more deaths than predicted by the current table.

Chart 8 has the same comparison for Safety members. Experience shows that there were slightly more deaths than predicted by the current table.

Chart 9 shows the life expectancies under the current and the proposed tables for General members and all beneficiaries.

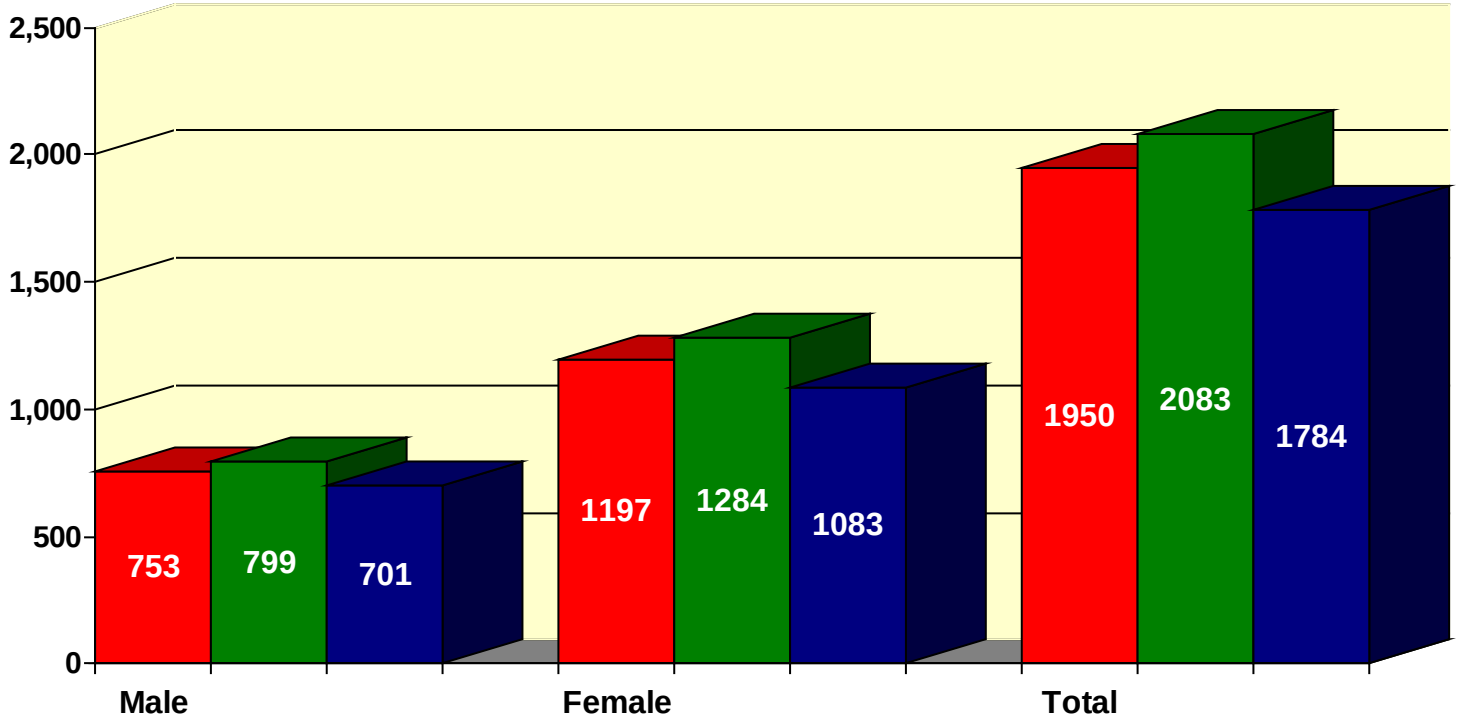
Chart 10 has the same information for Safety members.

Mortality Table for Member Contributions

We recommend the mortality table used for determining contributions for General members be changed from the RP-2000 Combined Healthy Mortality Table projected with scale AA to 2016 set back two years for males and set back one year for females weighted 30% male and 70% female to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D with no age adjustment for males and set forward one year for females weighted 30% male and 70% female. This is based on the proposed mortality table for General members and the actual gender distribution for current General members.

For Safety members, we recommend the mortality table be changed from the RP-2000 Combined Healthy Mortality Table projected with scale AA to 2016 set back one year for males and no age set back for females weighted 75% male and 25% female to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D set back two years weighted 75% male and 25% female. This is based on the proposed mortality table for Safety members and the actual gender distribution for current Safety members.

Chart 7
Post-Retirement Deaths Non-Disabled General Members and All Beneficiaries



July 1, 2009 - June 30, 2015

Expected - Current Actual Expected - Proposed

Chart 8
Post-Retirement Deaths Non-Disabled Safety Members

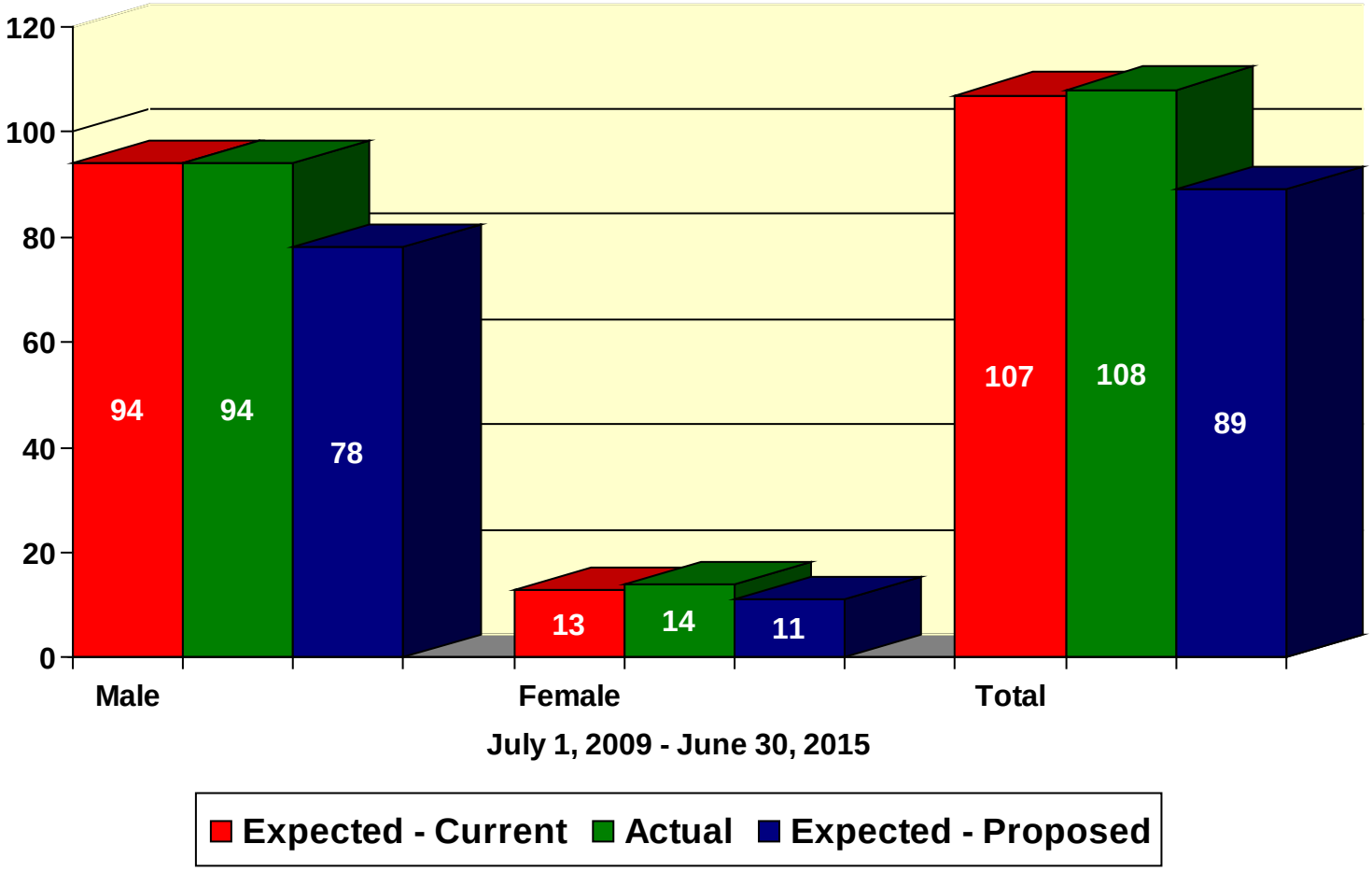


Chart 9
Life Expectancies
Non-Disabled General Members and All Beneficiaries

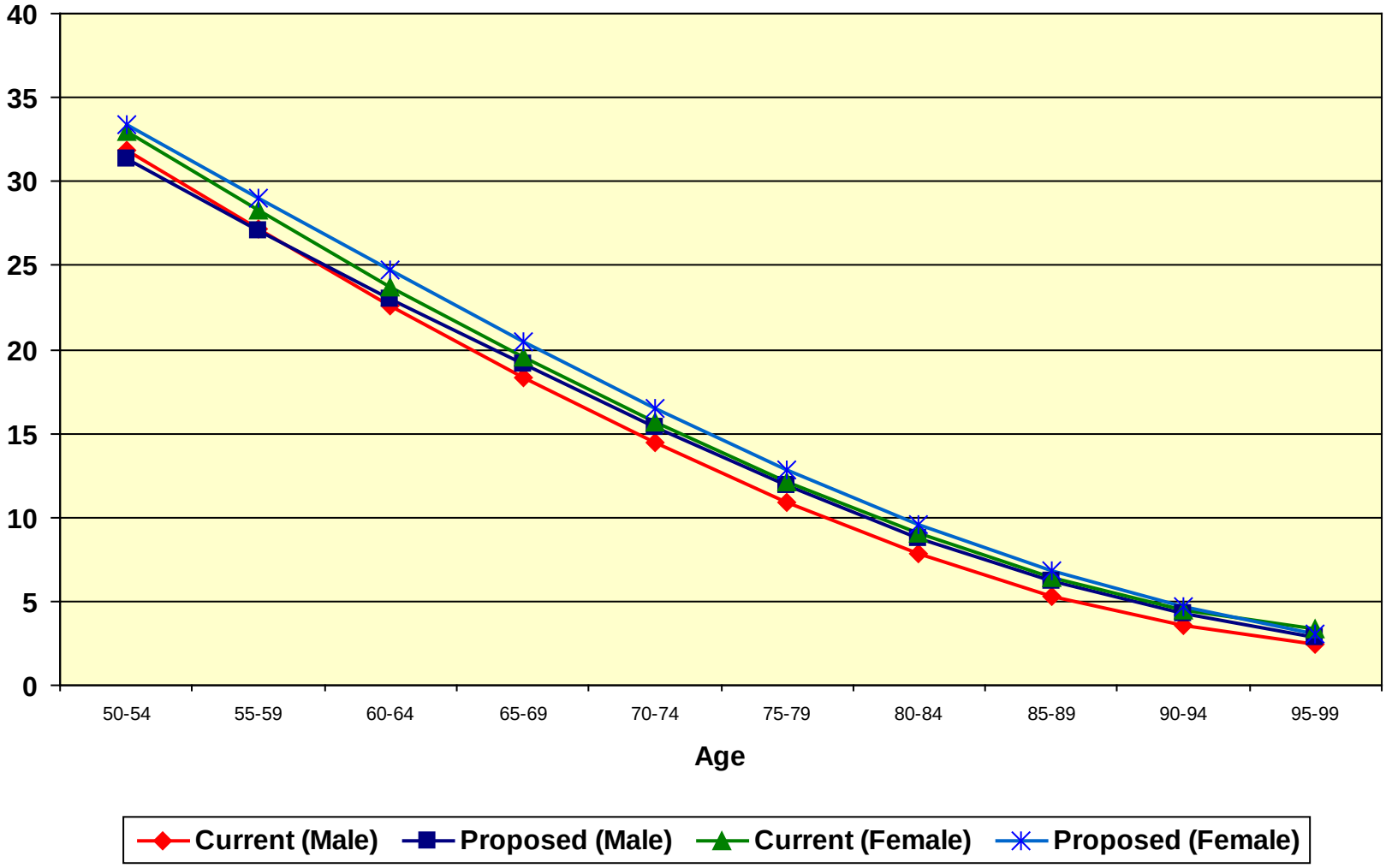
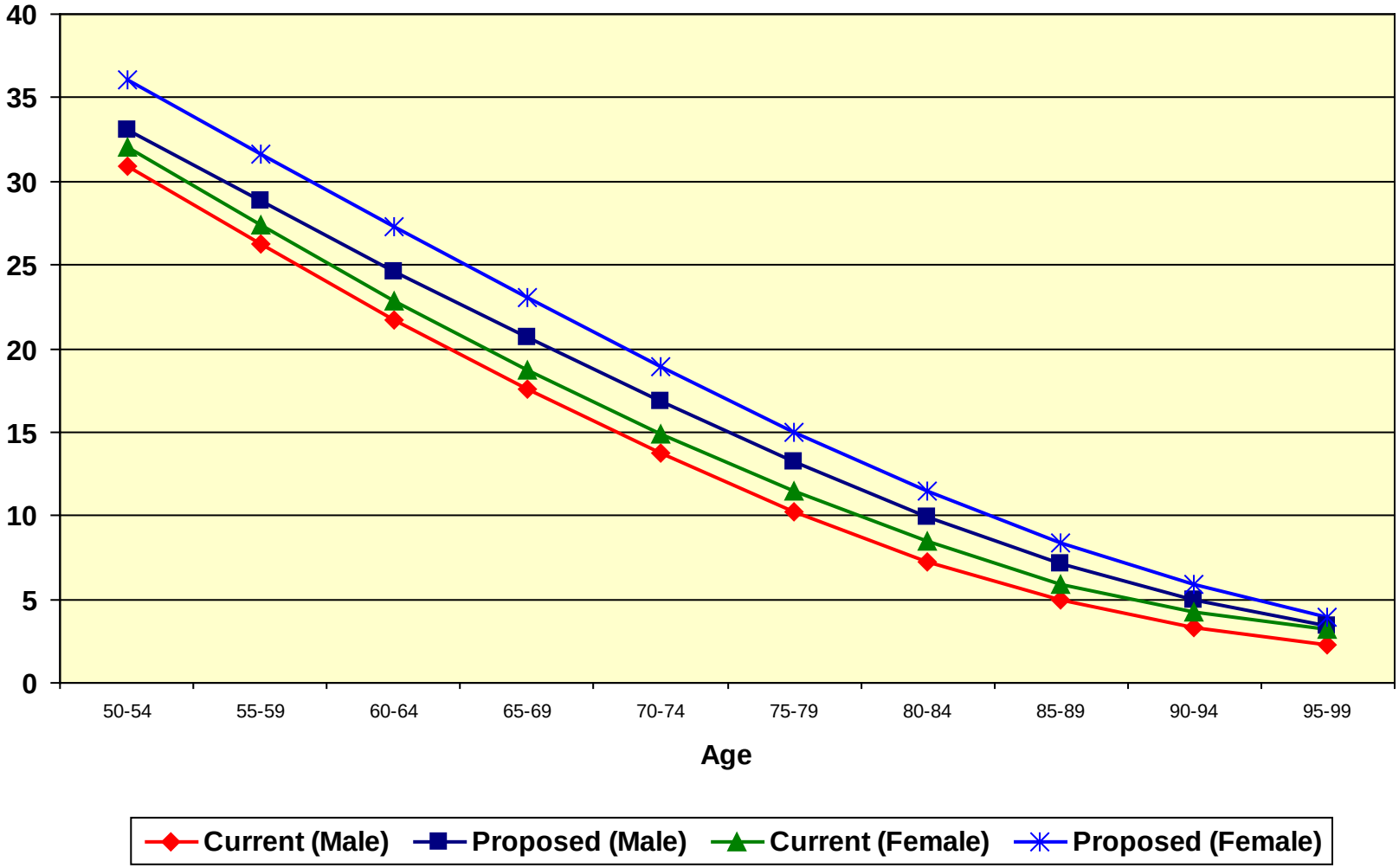


Chart 10
Life Expectancies
Non-Disabled Safety Members



C. MORTALITY RATES - DISABLED

Since death rates for disabled members can differ from those of healthy members, a different mortality assumption is often used. The table currently being used is the RP-2000 Combined Healthy Mortality Table projected with scale AA to 2016 (separate tables for males and females) set forward three years for both General and Safety members.

The number of actual deaths compared to the number expected under the current and proposed assumptions for the last six years are as provided in the table below. As there have been relatively fewer deaths among Safety members when compared to General members, we have also provided for informational purposes only the ratios of actual to expected deaths for the last nine years under the current and proposed assumptions for Safety members.

	General – Disabled			Safety – Disabled		
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths	Current Expected Deaths	Actual Deaths [10]	Proposed Expected Deaths
Male	47	53	44	47	39	35
Female	84	86	70	9	10	7
Total	131	139	114	56	49	42
Actual / Expected	106%		122%	87%		117%
Actual / Expected Over 9 Yrs (for informational purposes only)				95%		122%

Based on the actual experience, we recommend changing the mortality table for General disabled members to the Headount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015D, set forward five years for males and set forward four years for females.

Based on the actual experience, we recommend changing the mortality table for Safety disabled members to the Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table (separate tables for males and females) projected 20 years with the two-dimensional scale MP2015D, set forward one year.

Chart 11 compares actual to expected deaths under both the current and the proposed assumptions for disabled General members over the last six years.

Chart 12 compares actual to expected deaths under both the current and the proposed assumptions for disabled Safety members over the last six years.

[10] There were 22, 27 and 22 deaths during the 2012-2015, 2009-2012 and 2006-2009 periods, respectively, for an average of 24 deaths for each 3-year period.

Chart 13 and 14 show the life expectancies under both the current and the proposed tables for General and Safety, respectively.

Chart 11
Post - Retirement Deaths
Disabled General Members

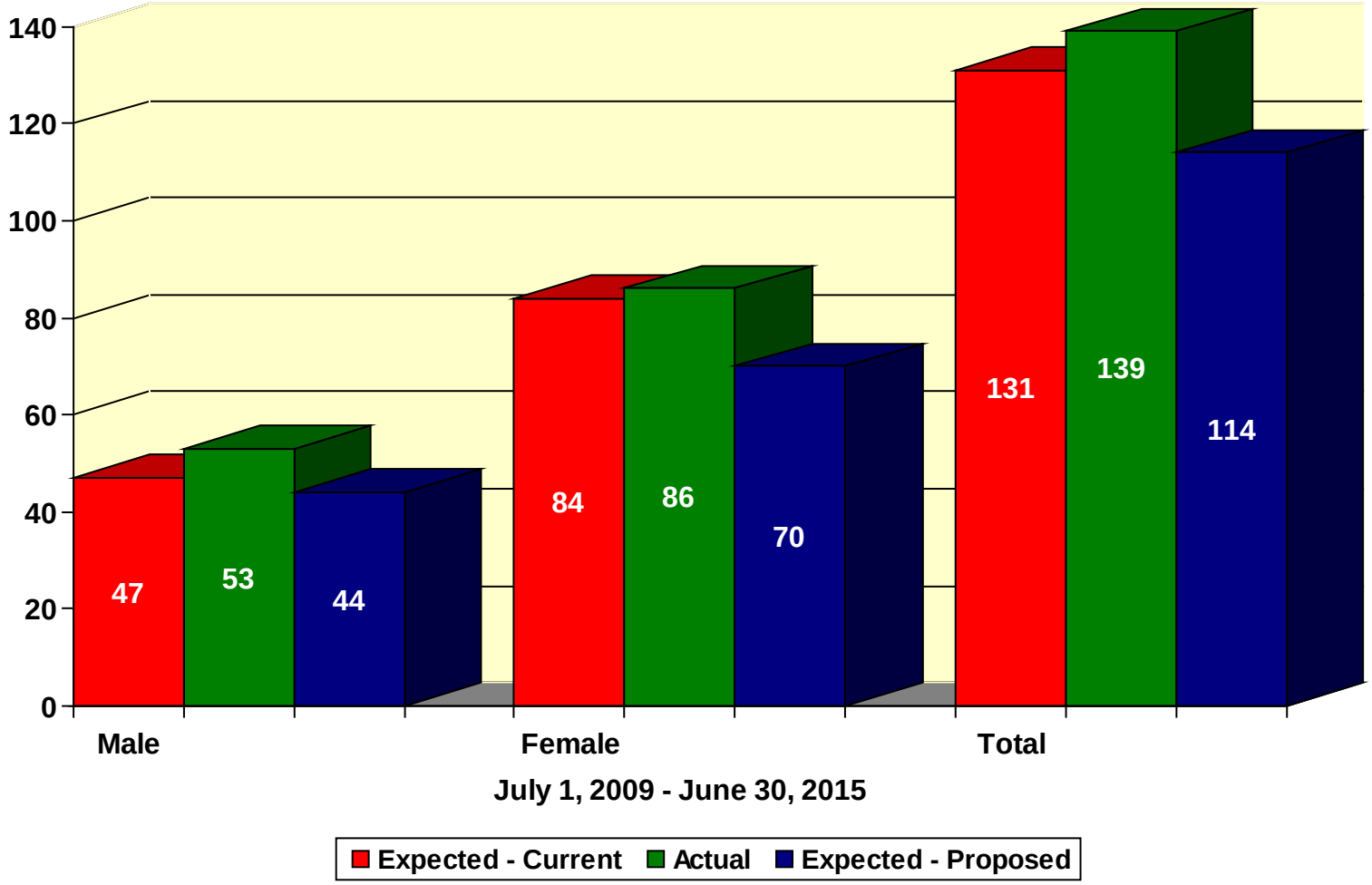


Chart 12
Post - Retirement Deaths
Disabled Safety Members

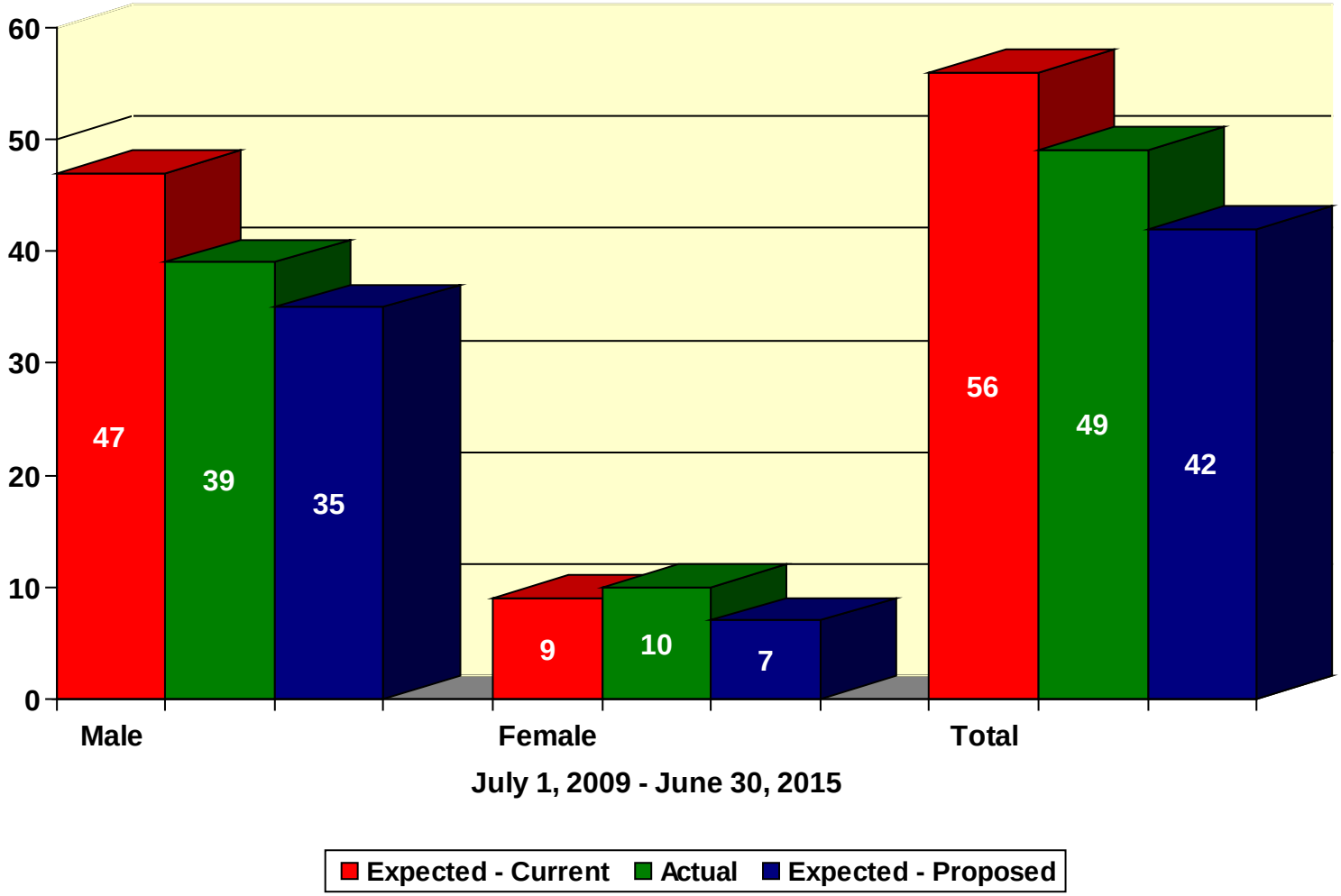


Chart 13
Life Expectancies
Disabled General Members

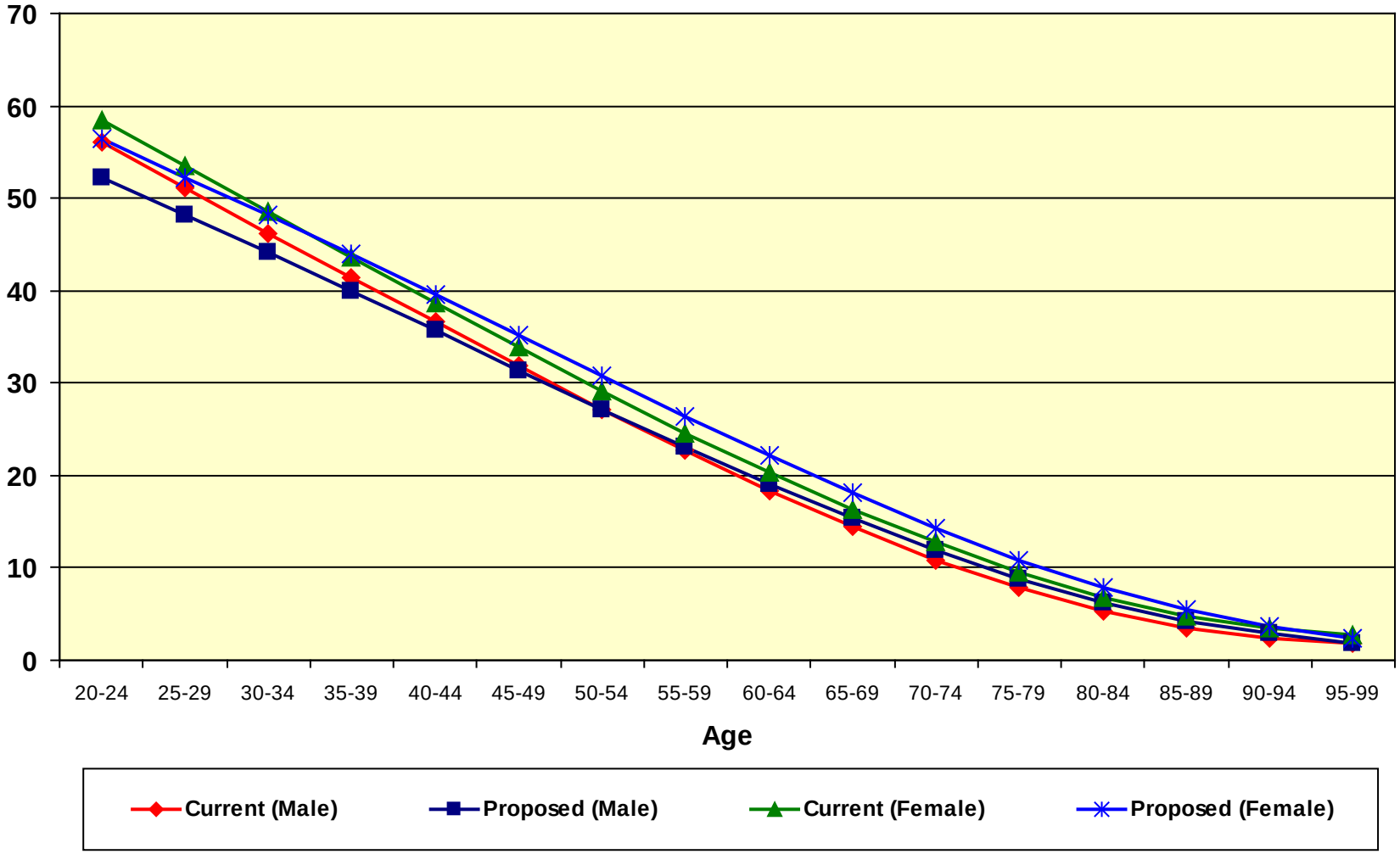
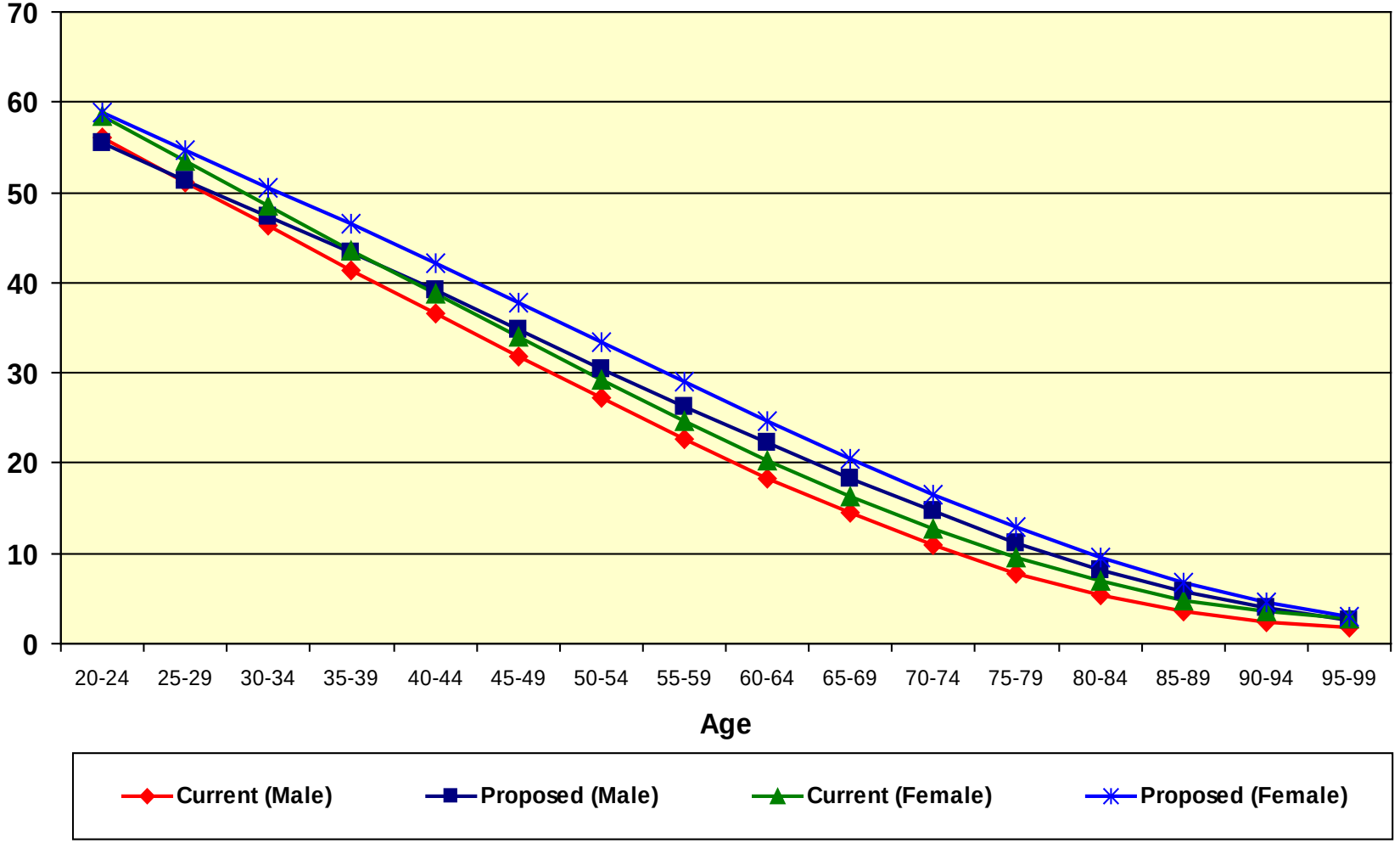


Chart 14
Life Expectancies
Disabled Safety Members



D. TERMINATION RATES

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current sex distinct assumptions, there is an overall assumed incidence of total termination combined with a separate assumption for the percent of members who would elect a refund of contributions versus those who would leave their contributions on deposit and receive a deferred vested benefit. With this experience study, we are recommending combining the experience from both male and female General members to increase the experience available to set this assumption. The termination experience (total) over the last three years for General members separated between those members with under five years of service and those with five or more years of service is as follows:

Rates of Termination (General Separate)
(Less than Five Years of Service)

Years of Service	Current Male Rate	Observed Male Rate	Current Female Rate	Observed Female Rate
0	13.50%	9.96%	14.50%	10.33%
1	8.25	7.38	9.25	8.82
2	5.70	5.07	6.50	8.42
3	4.30	5.35	6.00	6.43
4	4.05	4.08	5.50	7.43

Rates of Termination (General Combined)
(Less than Five Years of Service)

Years of Service	Current Rate[11]	Observed Rate	Proposed Rate
0	14.17%	10.21%	11.75%
1	8.94	8.37	8.50
2	6.24	7.33	7.00
3	5.44	6.07	5.75
4	5.03	6.36	5.50

[11] This column shows composite rates of both General male and General female termination assumptions.

Rates of Termination (General Separate)

(Five or More Years of Service)

Years of Service	Current Male Rate	Observed Male Rate	Current Female Rate	Observed Female Rate
20 – 24	5.10%	0.00%	5.35%	0.00%
25 – 29	4.20	4.00	5.15	3.93
30 – 34	4.00	3.13	4.30	3.71
35 – 39	3.24	2.76	3.45	3.72
40 – 44	2.32	2.97	2.50	2.49
45 – 49	2.31	1.47	2.25	1.76
50 – 54	2.50	4.75	2.25	3.35
55 – 59	2.50	1.75	2.25	2.53
60 – 64	2.50	4.20	2.25	4.55
65 – 69	2.50	9.76	2.25	11.38

Rates of Termination (General Combined)

(Five or More Years of Service)

Age	Current Rate[12]	Observed Rate	Proposed Rate
20 – 24	5.35%	0.00%	5.35%
25 – 29	4.90	3.95	4.50
30 – 34	4.22	3.56	4.00
35 – 39	3.39	3.45	3.40
40 – 44	2.45	2.63	2.50
45 – 49	2.27	1.67	2.40
50 – 54	2.33	3.80	2.40
55 – 59	2.34	2.27	2.40
60 – 64	2.34	4.42	2.40
65 – 69	2.35	10.73	2.40

[12] This column shows composite rates of both General male and General female termination assumptions.

The termination experience over the last three years for Safety members separated between those members with under five years of service and those with five or more years of service is as follows:

Rates of Termination (Safety)
(Less than Five Years of Service)

Years of Service	Current Rate	Observed Rate	Proposed Rate
0	11.50%	7.47%	9.00%
1	8.00	3.94	7.00
2	4.00	3.98	4.00
3	3.00	3.32	3.00
4	2.75	3.28	2.90

Rates of Termination (Safety)
(Five or More Years of Service)

Age	Current Rate	Observed Rate	Proposed Rate
20 – 24	3.50%	0.00%	3.30%
25 – 29	2.98	3.44	3.00
30 – 34	2.38	1.41	2.00
35 – 39	1.76	1.38	1.60
40 – 44	1.08	0.69	1.00
45 – 49	1.08	0.46	0.80
50 – 54	0.95	2.63	1.20
55 – 59	1.40	0.00	1.00
60 – 64	1.70	0.00	1.00
65 – 69	0.00	0.00	0.00

Chart 15 compares actual to expected total terminations over the past three years for both the current and proposed assumptions for General and Safety members.

Chart 16 shows the current along with the proposed termination rates for General members with less than five years of service.

Chart 17 shows the same information as Chart 16, but for Safety members.

Chart 18 shows the current and proposed termination rates for General members with over five years of service.

Chart 19 shows the same information as Chart 18, but for Safety members.

Based upon the recent experience, we have adjusted the termination rates accordingly. We also continued to assume that all termination rates are zero for members eligible to retire; that is, it is assumed that members eligible to retire at termination will retire rather than defer their benefit.

In addition, among the terminations, we recommend the following assumptions for the percent of members electing a refund and the percent of members electing to leave their contributions on deposit so that they would be eligible to receive a deferred retirement benefit.

Proportion of Total Termination Assumed to Receive Refunds and Deferred Vested Benefit Based on all General and Safety Data

	Refunds			Deferred Vested Benefits		
Years of Service	Current Rate	Observed Rate	Proposed Rate	Current Rate	Observed Rate	Proposed Rate
0-4	60.00%	64.40%	65.00%	40.00%	35.60%	35.00%
5 or more	15.00	18.54	20.00	85.00	81.46	80.00

Chart 15
Actual Number of Terminations Compared to Expected

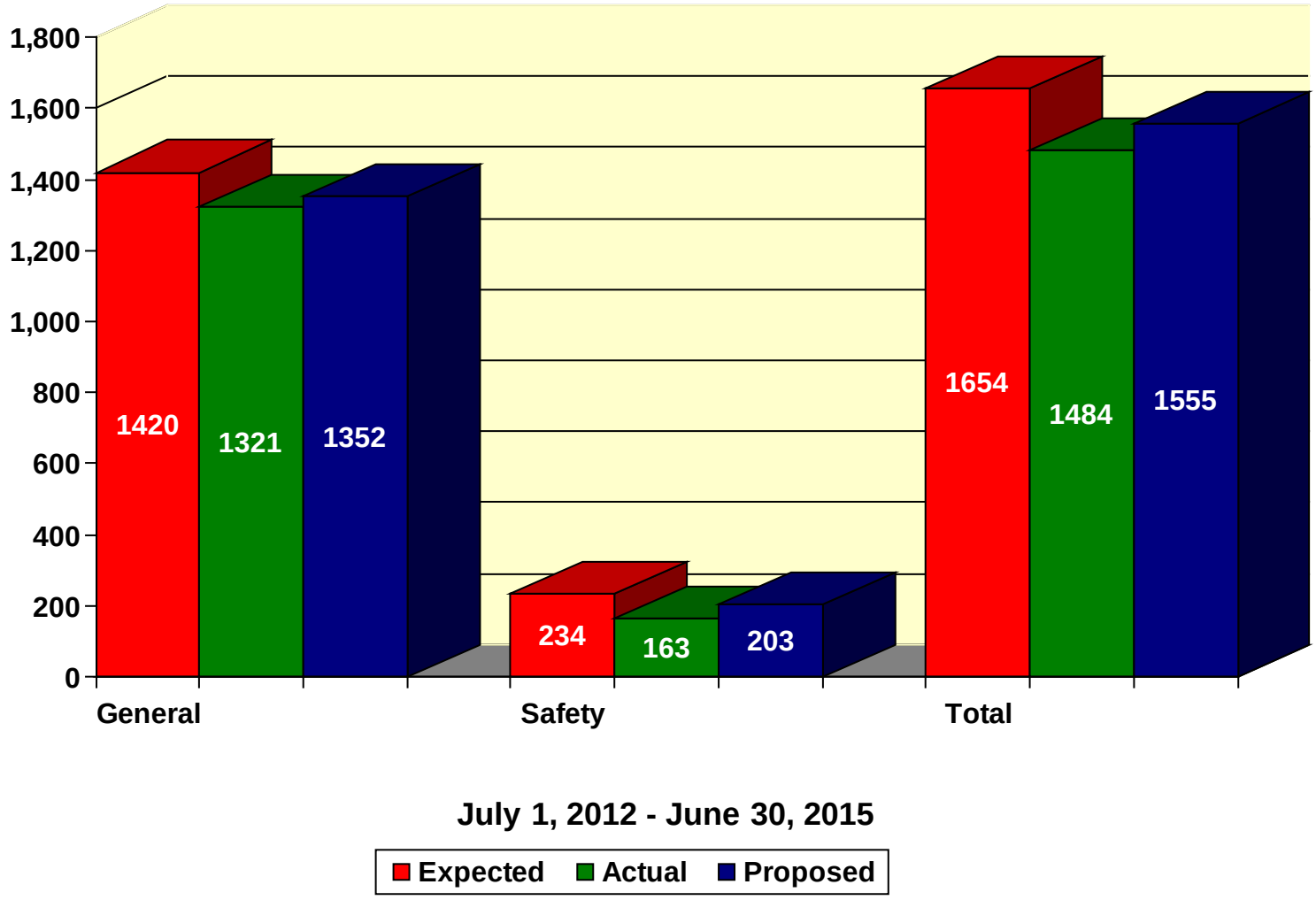


Chart 16
Termination Rates - General Members
(Less than 5 Years of Service)

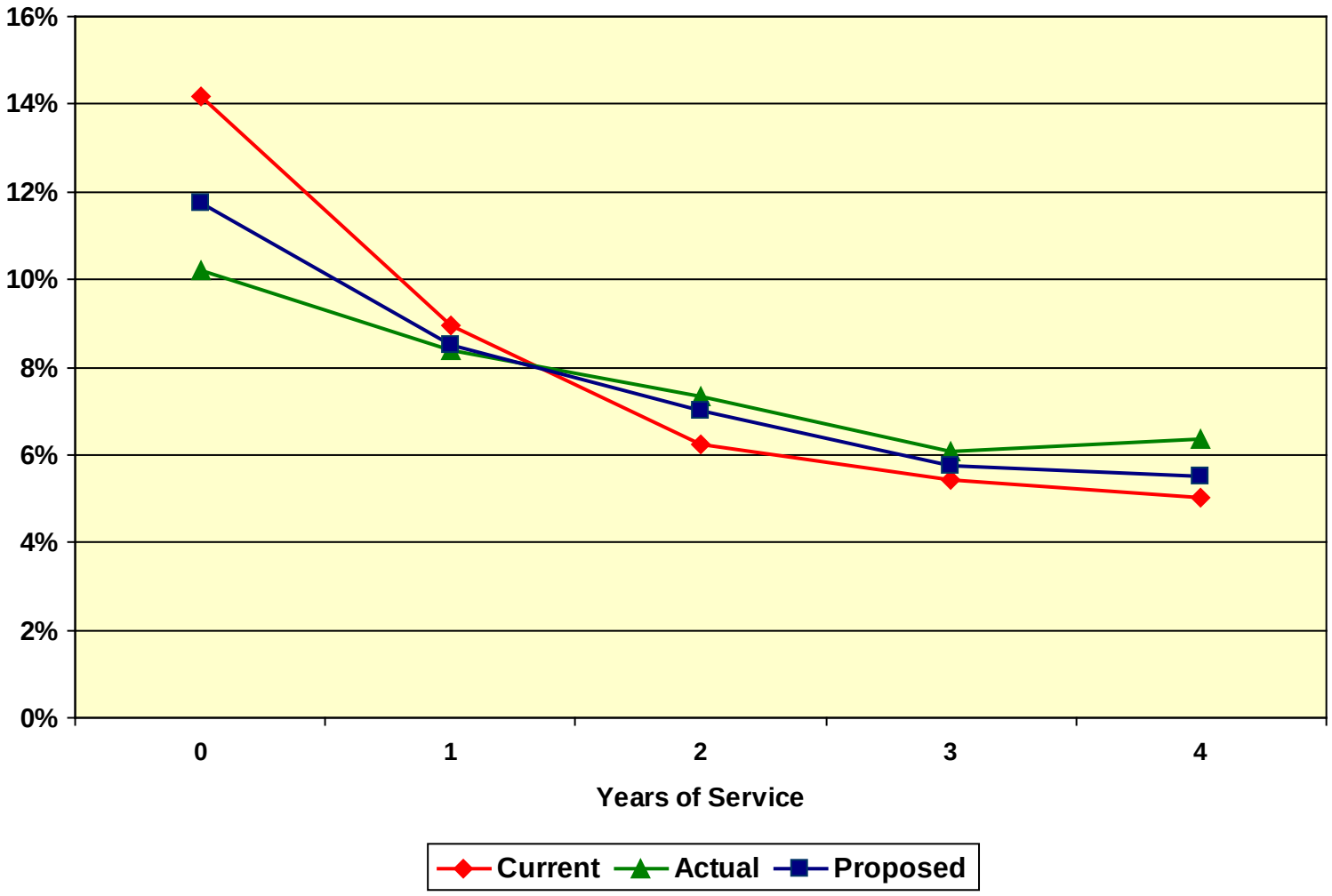


Chart 17
Termination Rates - Safety Members
(Less than 5 Years of Service)

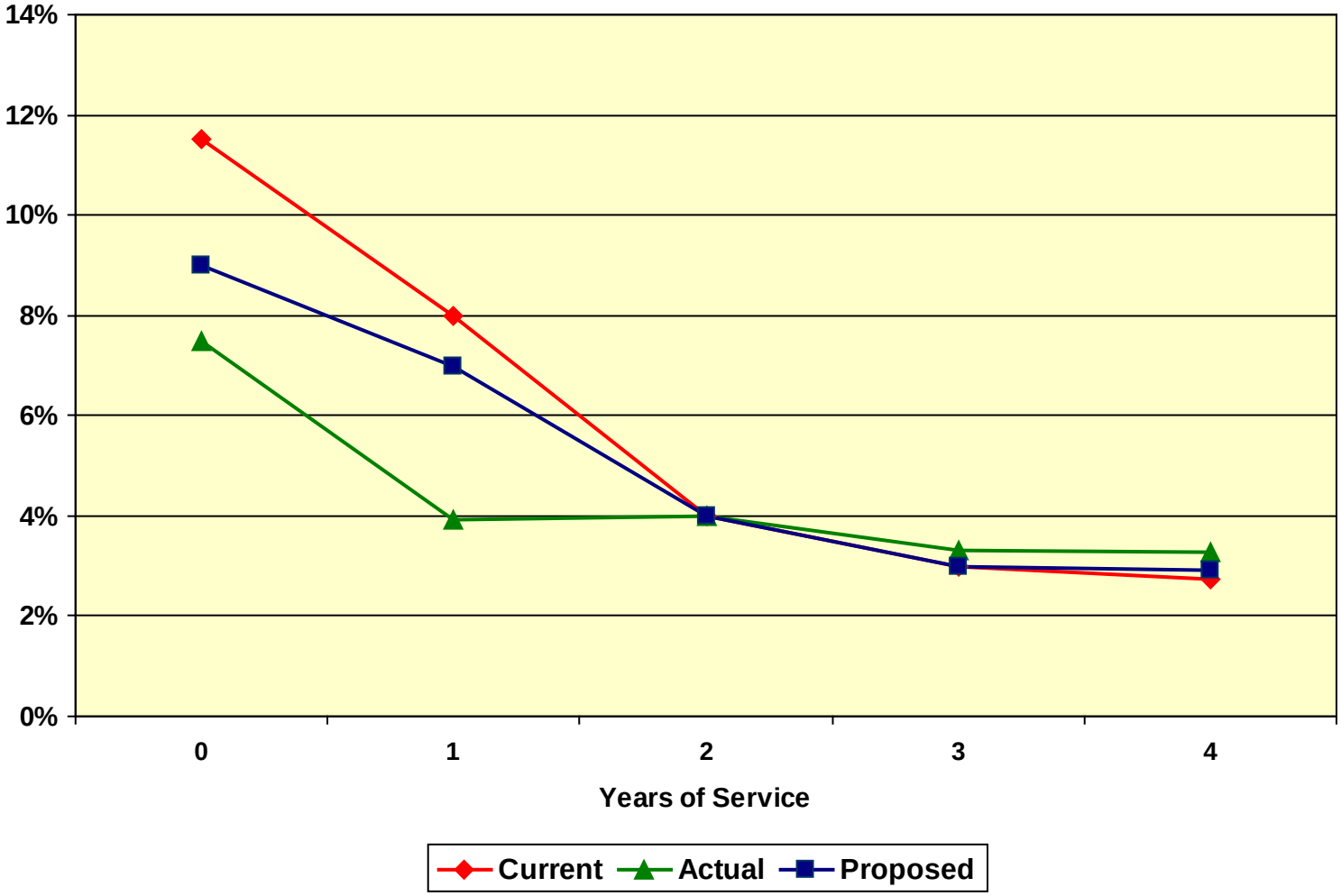


Chart 18
Termination Rates - General Members
(Over 5 Years of Service)

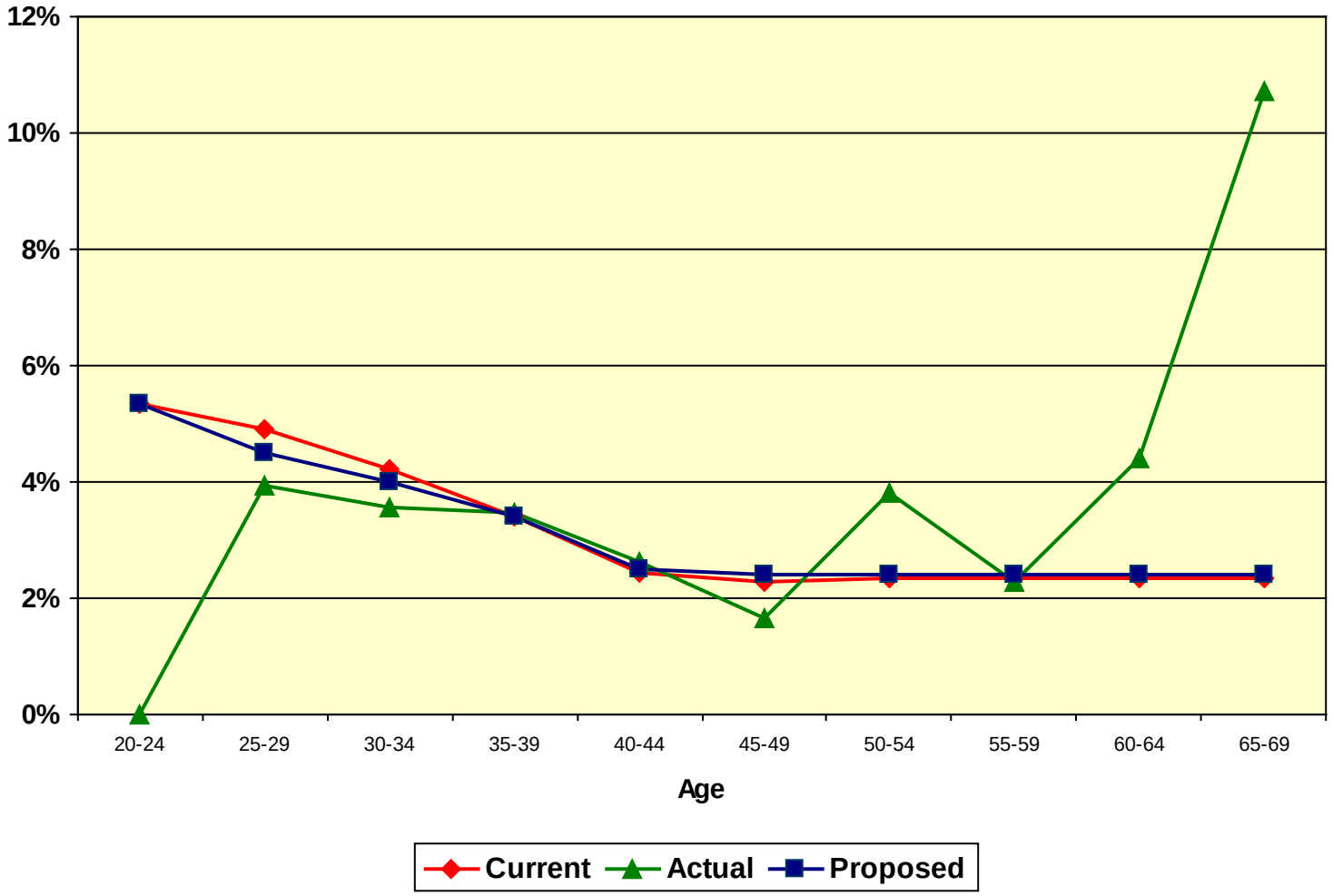
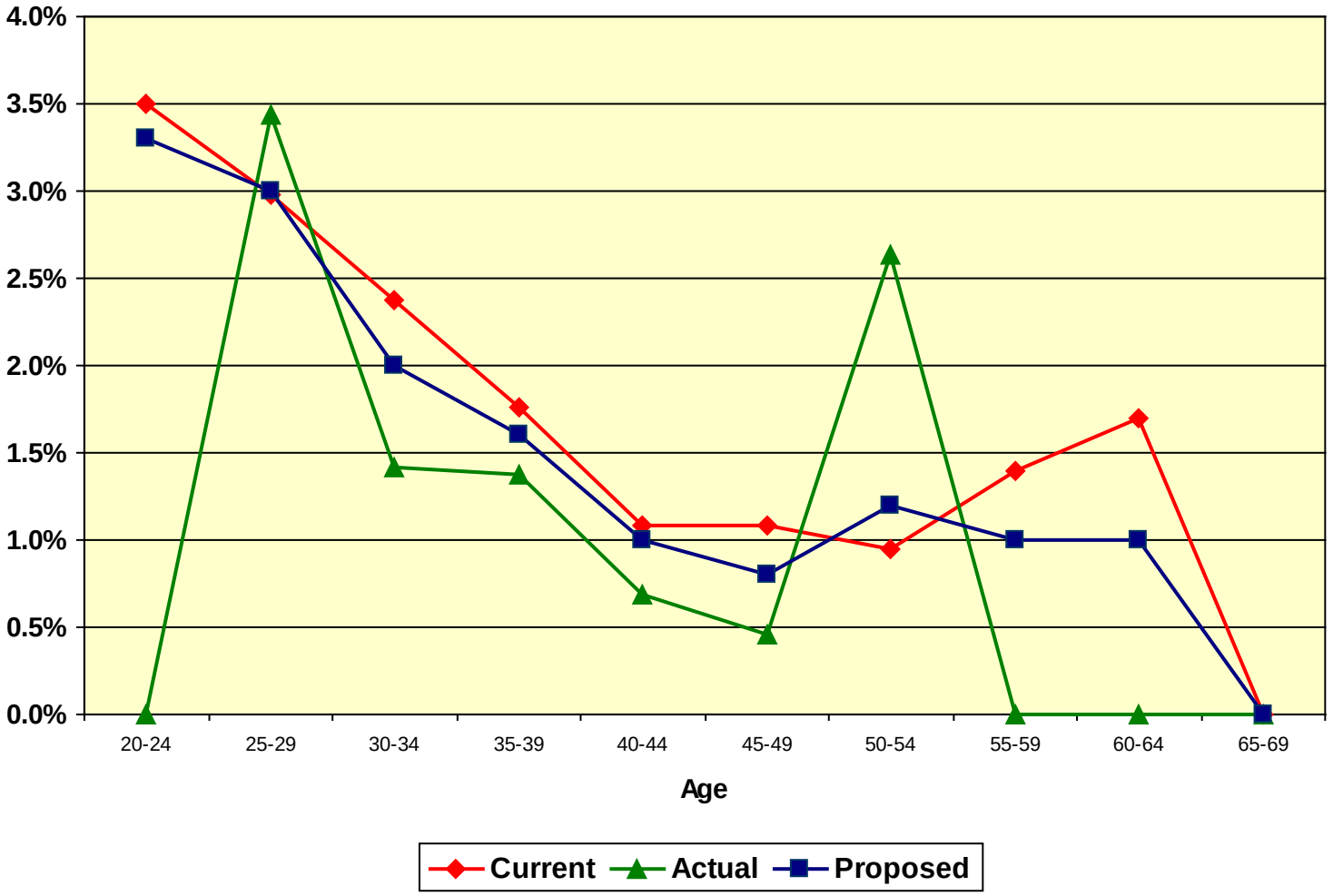


Chart 19
Termination Rates - Safety Members
(Over 5 Years of Service)



E. DISABILITY INCIDENCE RATES

When a member becomes disabled, he or she may be entitled to a pension that depends upon the member's years of service (non-service connected disability), or the greater of that benefit or a 50% pension (service connected disability). Similar to termination rates, we are recommending combining the experience from both male and female General members to increase the experience available to set this assumption. The following summarizes the actual experience over the past three years compared to the current and proposed assumptions for both non-service connected and service-connected disability incidence.

Rates of Non-Service Connected Disability Incidence (General Separate)

Years of Service	Current Male Rate	Observed Male Rate	Current Female Rate	Observed Female Rate
20 – 24	0.00%	0.00%	0.00%	0.00%
25 – 29	0.00	0.00	0.00	0.00
30 – 34	0.01	0.00	0.01	0.00
35 – 39	0.02	0.00	0.02	0.00
40 – 44	0.05	0.00	0.08	0.10
45 – 49	0.07	0.07	0.11	0.12
50 – 54	0.12	0.11	0.16	0.07
55 – 59	0.22	0.11	0.18	0.11
60 – 64	0.22	0.08	0.25	0.10
65 – 69	0.22	0.57	0.25	0.15
70 – 74	0.22	0.00	0.25	0.00

Rates of Non-Service Connected Disability Incidence (General Combined)

Age	Current Rate[13]	Observed Rate	Proposed Rate
20 – 24	0.00%	0.00%	0.00%
25 – 29	0.00	0.00	0.00
30 – 34	0.01	0.00	0.01
35 – 39	0.02	0.00	0.02
40 – 44	0.07	0.07	0.07
45 – 49	0.10	0.10	0.10
50 – 54	0.15	0.08	0.12
55 – 59	0.19	0.11	0.15
60 – 64	0.24	0.10	0.18
65 – 69	0.24	0.30	0.24
70 – 74	0.24	0.00	0.24

Rates of Non-Service Connected Disability Incidence (Safety)

Age	Current Rate	Observed Rate	Proposed Rate
20 – 24	0.00%	0.00%	0.00%
25 – 29	0.00	0.00	0.00
30 – 34	0.00	0.00	0.00
35 – 39	0.04	0.23	0.08
40 – 44	0.07	0.05	0.08
45 – 49	0.07	0.06	0.08
50 – 54	0.07	0.08	0.08
55 – 59	0.07	0.20	0.12
60 – 64	0.07	0.48	0.12
65 – 69	0.00	0.00	0.00
70 – 74	0.00	0.00	0.00

[13] This column shows composite rates of both General male and General female non-service connected disability assumptions.

Rates of Service Connected Disability Incidence (General Separate)

Years of Service	Current Male Rate	Observed Male Rate	Current Female Rate	Observed Female Rate
20 – 24	0.01%	0.00%	0.00%	0.00%
25 – 29	0.01	0.13	0.01	0.00
30 – 34	0.01	0.08	0.04	0.03
35 – 39	0.04	0.00	0.08	0.03
40 – 44	0.08	0.00	0.10	0.11
45 – 49	0.21	0.06	0.17	0.10
50 – 54	0.24	0.15	0.17	0.15
55 – 59	0.30	0.15	0.30	0.41
60 – 64	0.35	0.15	0.30	0.28
65 – 69	0.10	0.27	0.10	0.42
70 – 74	0.10	0.00	0.10	0.00

Rates of Service Connected Disability Incidence (General Combined)

Age	Current Rate[14]	Observed Rate	Proposed Rate
20 – 24	0.00%	0.00%	0.00%
25 – 29	0.01	0.04	0.02
30 – 34	0.03	0.05	0.03
35 – 39	0.07	0.02	0.04
40 – 44	0.09	0.08	0.08
45 – 49	0.18	0.09	0.16
50 – 54	0.19	0.15	0.18
55 – 59	0.30	0.33	0.32
60 – 64	0.32	0.23	0.30
65 – 69	0.10	0.37	0.18
70 – 74	0.10	0.00	0.10

[14] This column shows composite rates of both General male and General female service connected disability assumptions.

Rates of Service Connected Disability Incidence (Safety)

Age	Current Rate	Observed Rate	Proposed Rate
20 – 24	0.03%	0.00%	0.03%
25 – 29	0.11	0.17	0.11
30 – 34	0.25	0.14	0.22
35 – 39	0.65	0.07	0.40
40 – 44	0.65	0.56	0.60
45 – 49	0.65	0.66	0.65
50 – 54	1.60	1.62	1.60
55 – 59	2.20	1.42	2.00
60 – 64	2.30	2.74	2.50
65 – 69	3.00	0.00	2.50
70 – 74	0.00	0.00	0.00

Chart 20 compares the actual number of non-service connected disabilities over the past three years to that expected under both the current and proposed assumptions. The current non-service and service disability rates were modified to reflect the past three years' experience.

Chart 21 shows actual non-service connected disablement rates, compared to the assumed and proposed rates for General members.

Chart 22 graphs the same information as Chart 21, but for Safety members.

Chart 23 compares the actual number of service connected disabilities over the past three years to that expected under both the current and proposed assumptions.

Chart 24 shows actual service connected disablement rates, compared to the assumed and proposed rates for General members.

Chart 25 graphs the same information as Chart 24, but for Safety members.

Overall, the proposed assumptions predict a higher number of total Safety non-service connected and a lower number of total General non-service connected, General service connected and Safety service connected.

Chart 20
Actual Number of Non-Service Connected Disabilities Compared to Expected

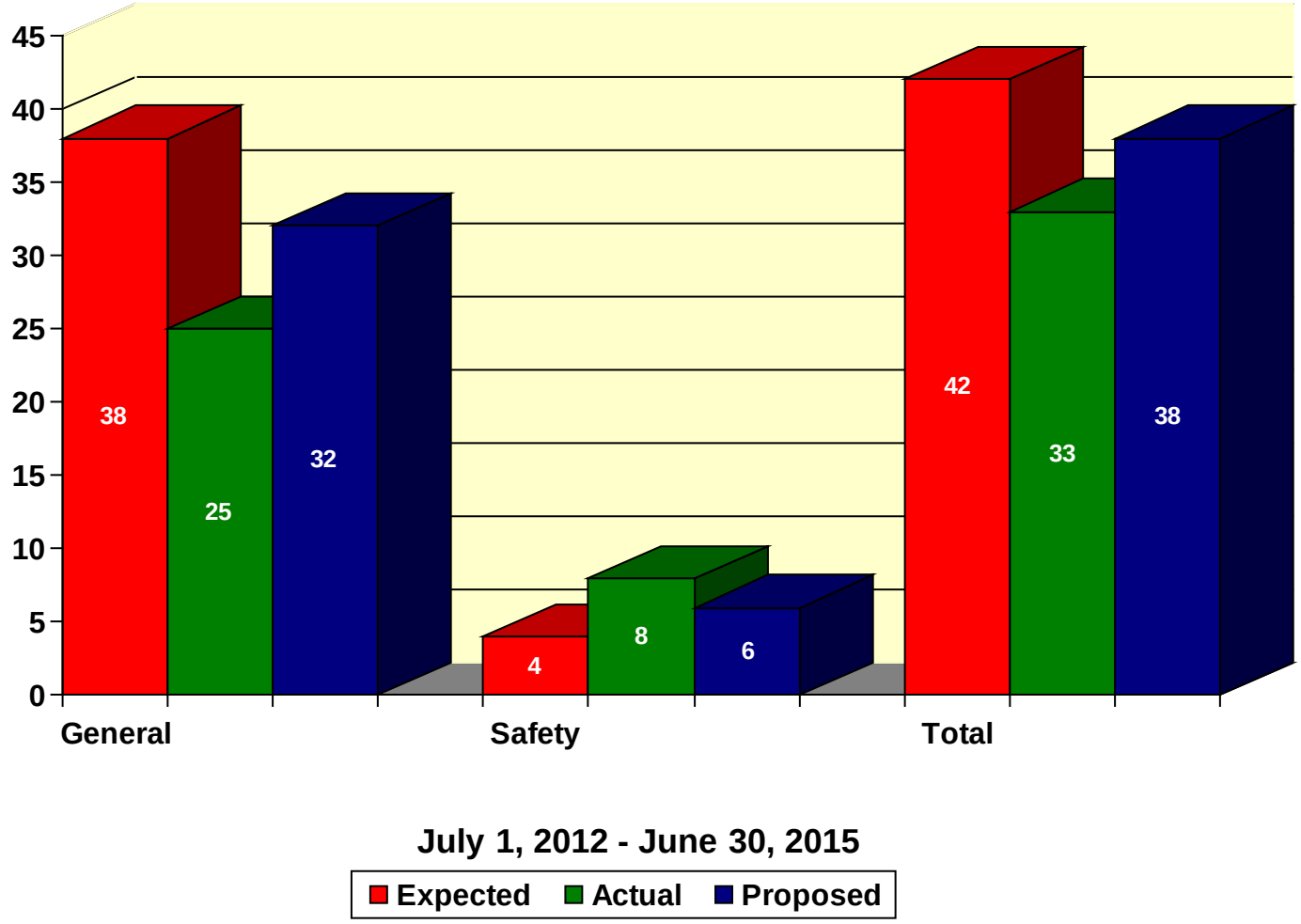


Chart 21
Non-Service Connected Disability Rates for General Members

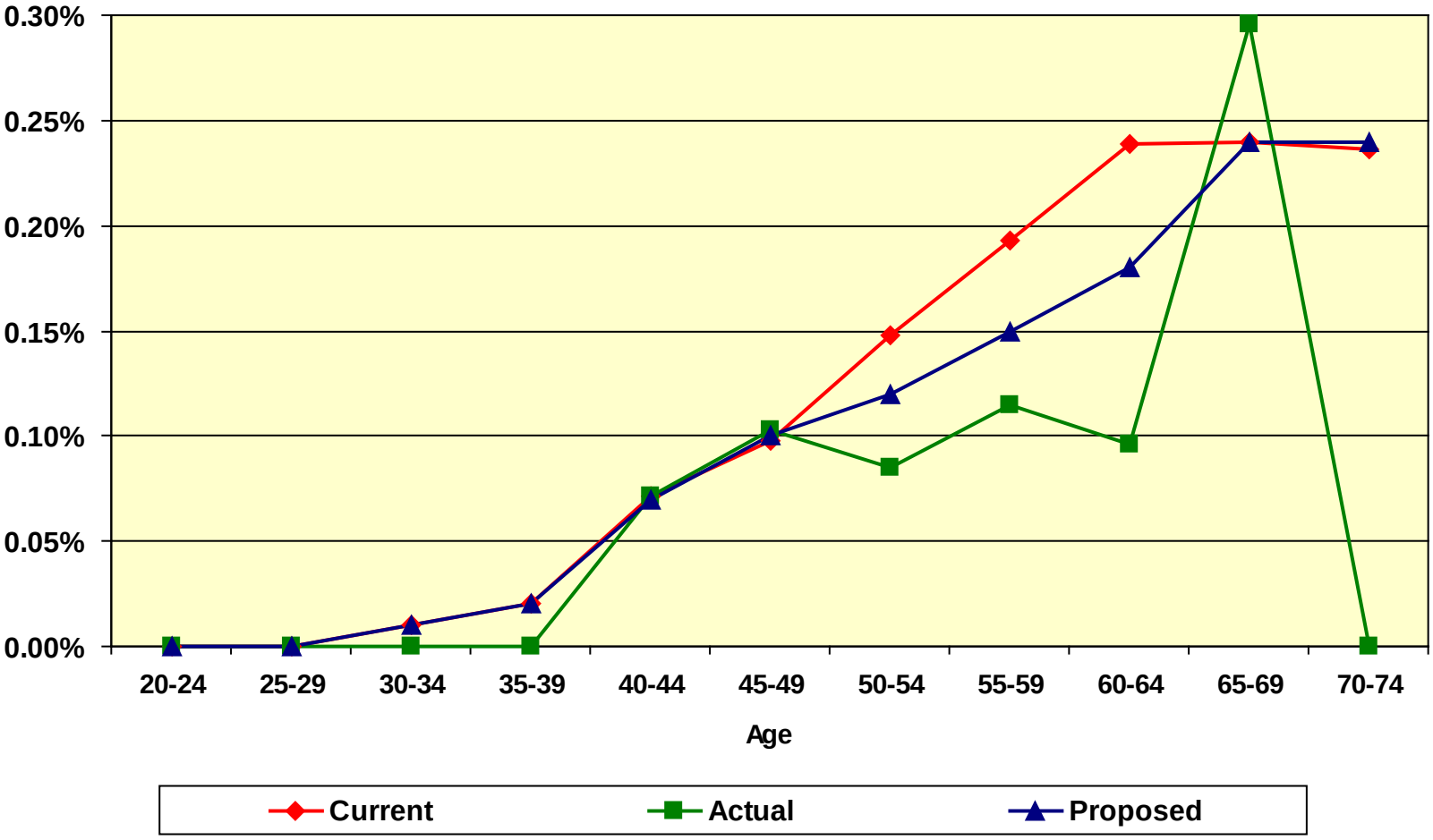


Chart 22
Non-Service Connected Disability Rates for Safety Members

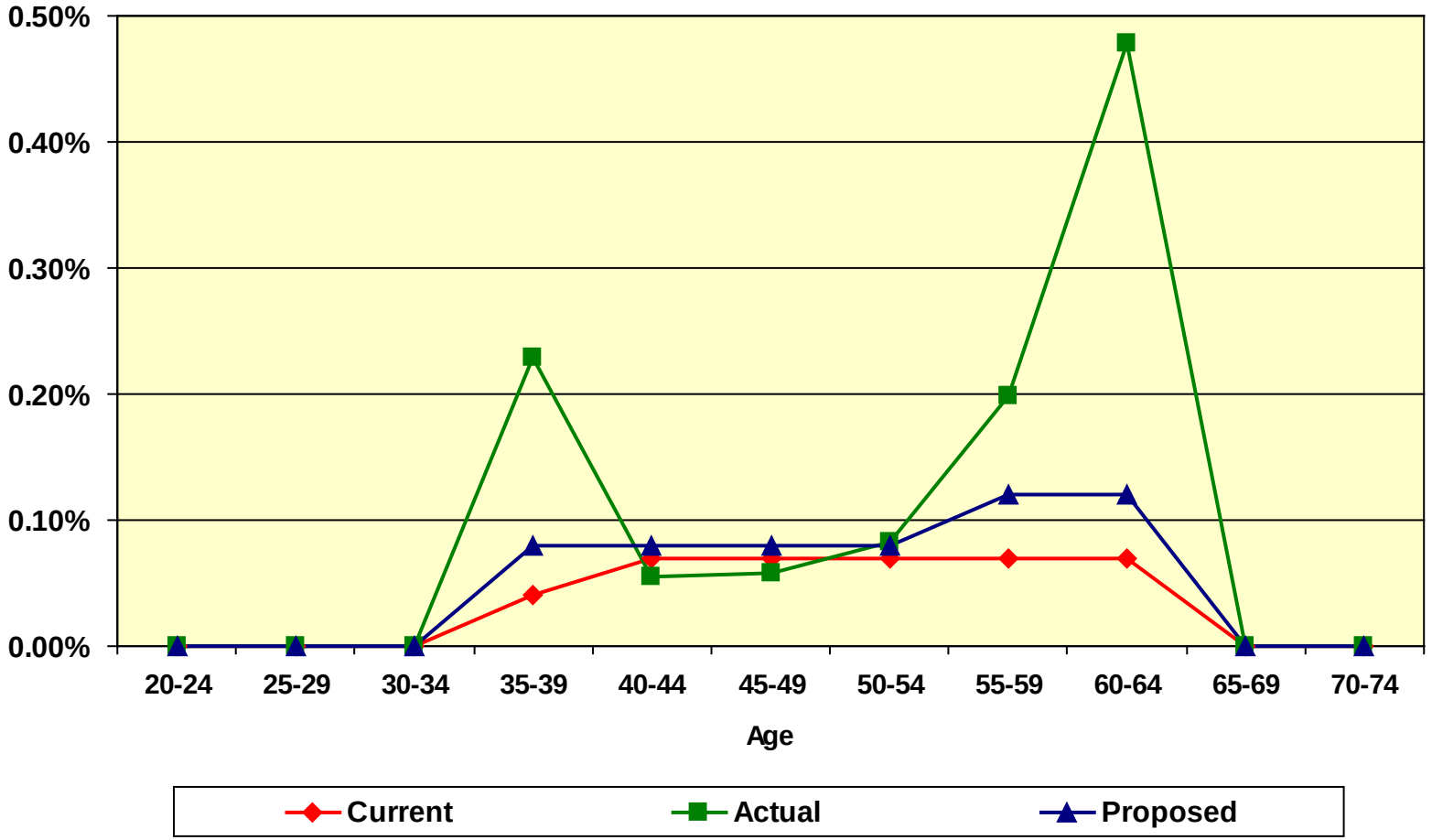


Chart 23
Actual Number of Service Connected Disabilities
Compared to Expected

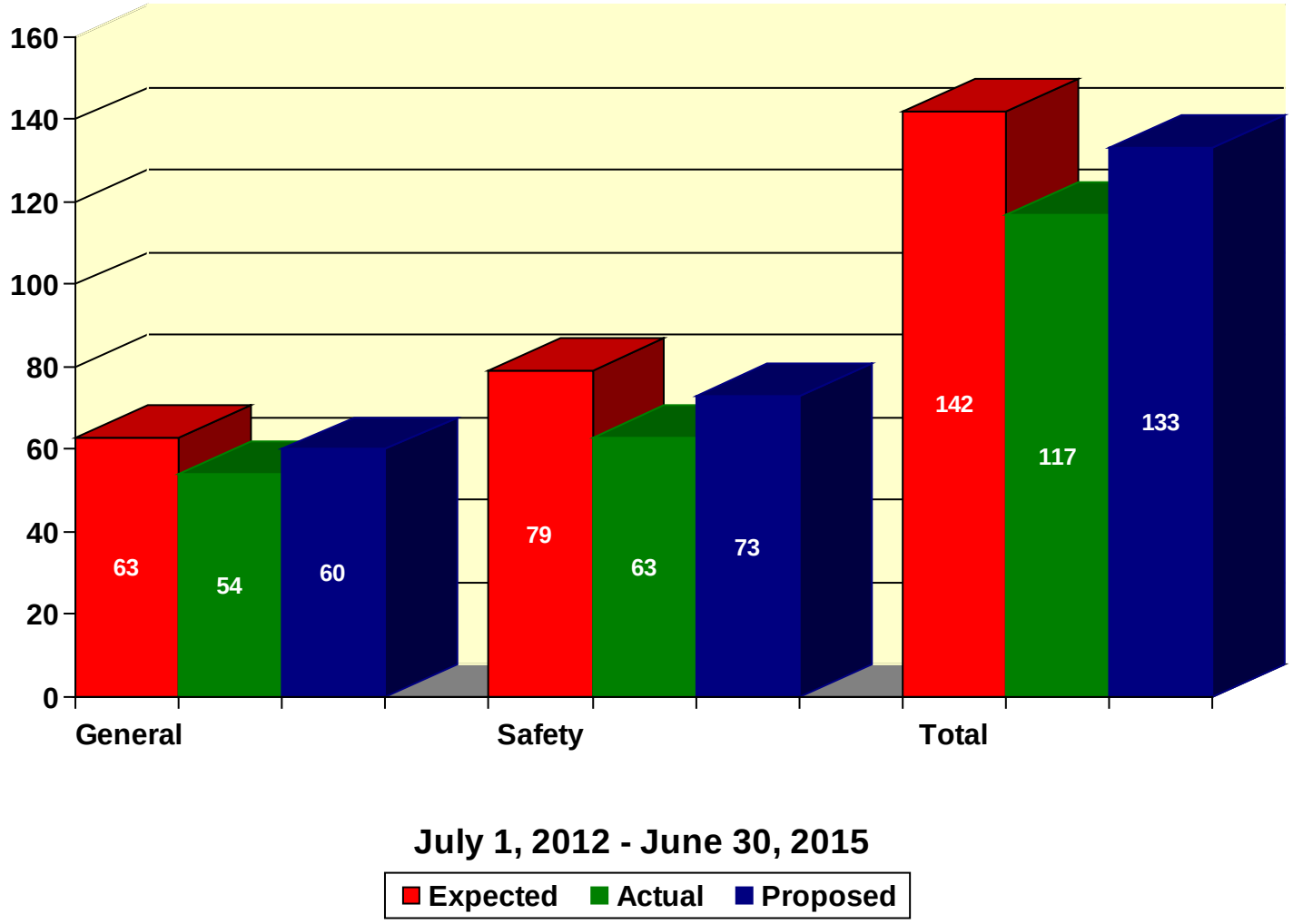


Chart 24
Service Connected Disability Rates
for General Members

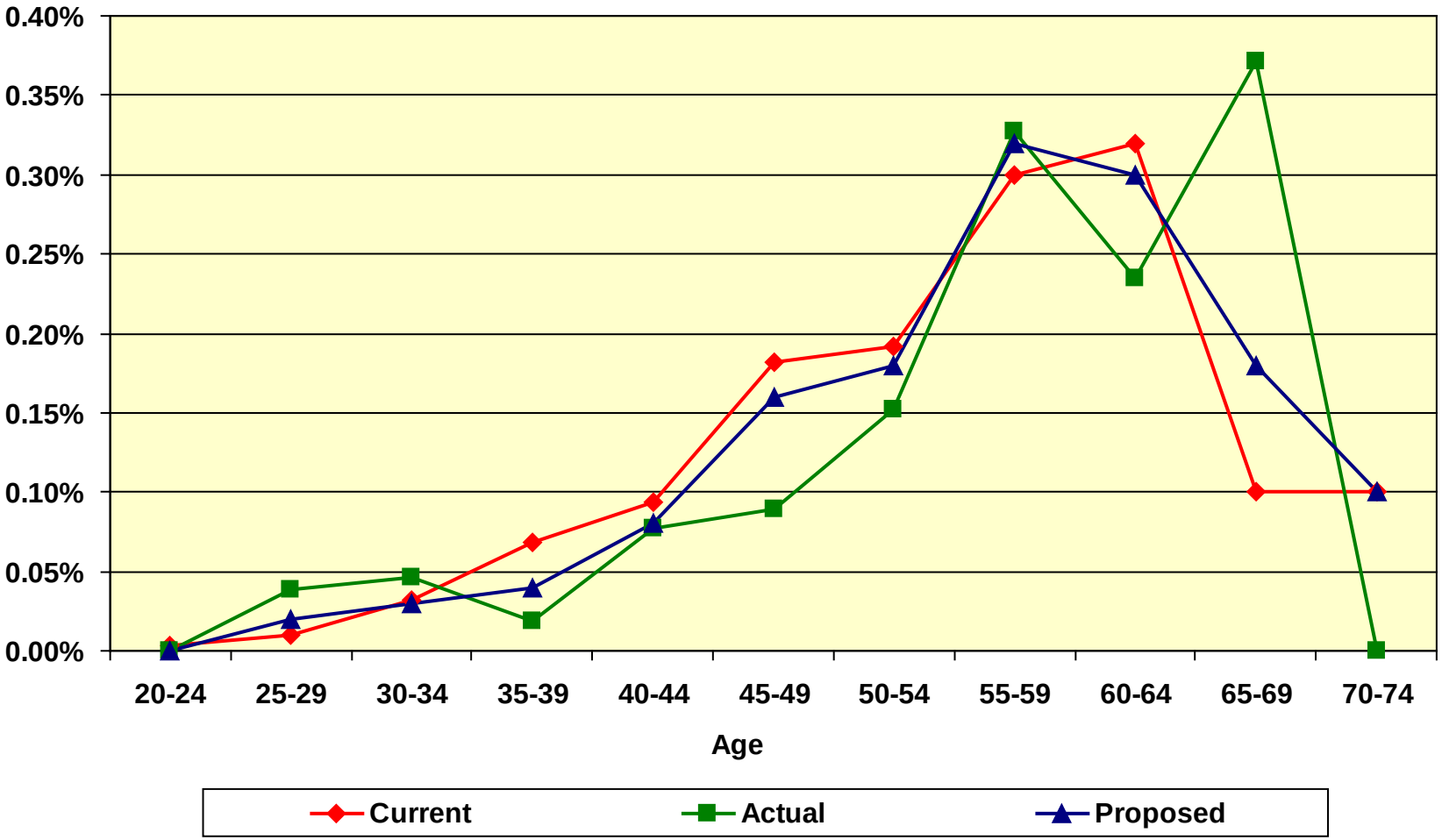
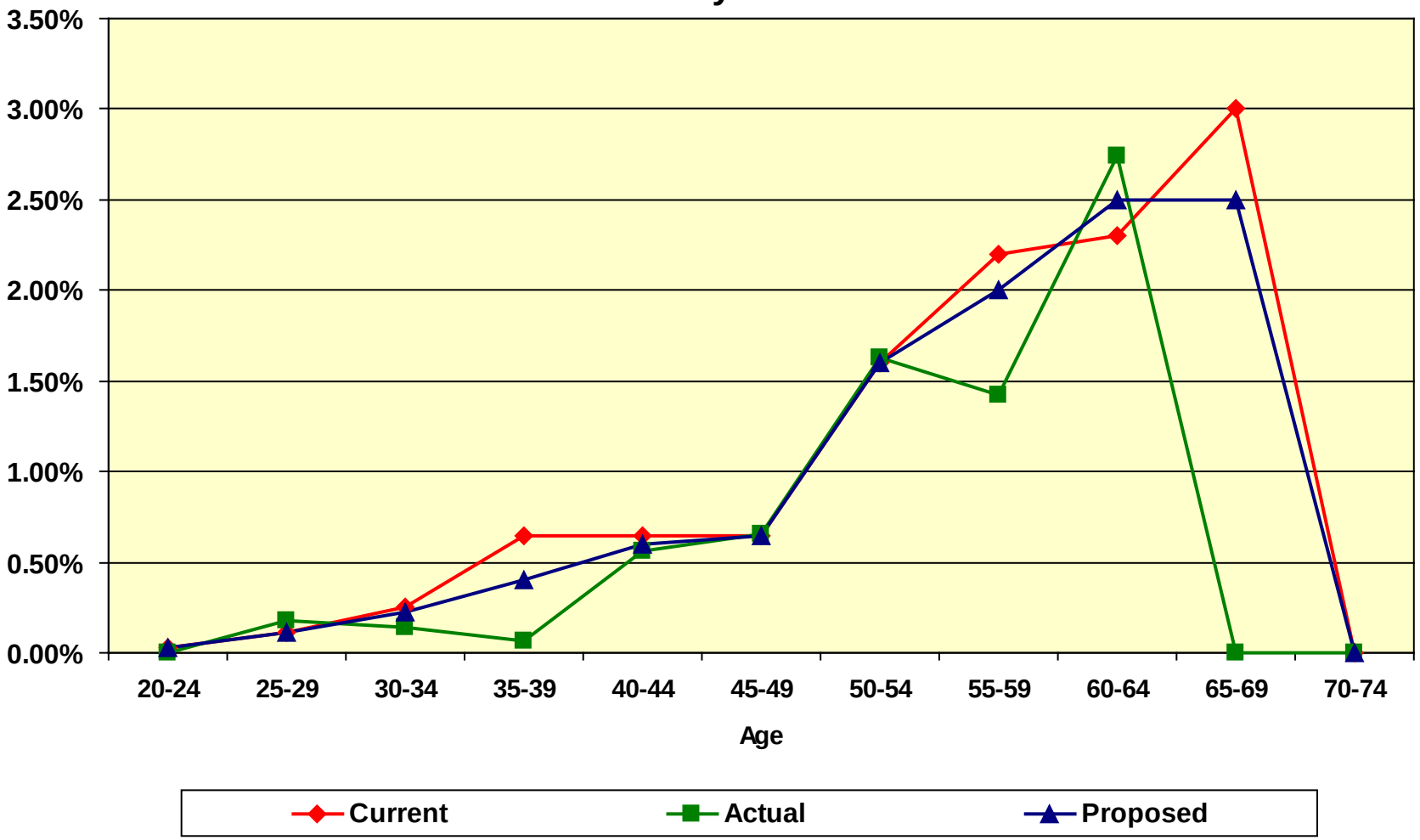


Chart 25
Service Connected Disability Rates
for Safety Members



F. MERIT AND PROMOTIONAL SALARY INCREASES

SDCERA's retirement benefits are determined in large part by a member's compensation just prior to retirement. For that reason it is important to anticipate salary increases that employees will receive over their careers. These salary increases are made up of three components:

- Inflationary increases;
- Real "across the board" increases; and
- Merit and promotional increases.

The inflationary increases are assumed to follow the general inflation assumption discussed in Section III of this report, where we recommended maintaining the inflation assumption at 3.00%. We also recommend in that report lowering the current 0.75% "across the board" real pay increases assumption to 0.50%. Therefore, the recommended total inflation and real "across the board" increase (i.e., wage inflation) assumption is 3.50%. This is also the assumed annual rate of payroll growth at which payments to amortize the Unfunded Actuarial Accrued Liability (UAAL) are assumed to increase.

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

- Measuring each member's actual salary increase over each year of the experience period;
- Categorizing these increases into service groups;
- Removing the wage inflation component from these increases (assumed to be equal to the increase in the members' average salary during the year);
- 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."

Note that to be consistent with other economic assumptions, these merit and promotional assumptions are used in combination with the 3.50% assumed inflation and real "across the board" increases shown in Section III of this report

Due to the high variability of the actual salary increases, we have analyzed this assumption using the data for the past six years. Also, based on emerging experience, we have extended the period of non-level salary increases from the first 5 years to the first 15 years of employment. The following table shows the General members' actual average merit and promotional increases by years of service over the three-year period from July 1, 2012 through June 30, 2015 as well as the six-year period from July 1, 2009 through June 30, 2015. The current and proposed assumptions are also shown. The actual average merit and promotional increases for the most recent three-year period and the prior three-year period were reduced by the actual average inflation plus real "across the board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year of the current and the prior three-year experience periods (0.55% and 0.85%, respectively, on average).

General

Years of Service	Current Assumptions	2009-2012 Actual Average Merit and Promotional Increases	2012-2015 Actual Average Merit and Promotional Increases	2009-2015 Actual Average Merit and Promotional Increases	Proposed Assumptions
Less than 1	6.00%	7.17%	10.16%	9.21%	6.75%
1	4.50	4.36	7.95	6.26	5.00
2	4.00	4.38	6.71	5.15	4.50
3	3.00	3.32	5.73	3.95	3.50
4	2.25	2.41	4.20	3.09	2.50
5	0.75	2.43	3.75	3.10	1.50
6	0.75	1.31	3.00	2.28	1.40
7	0.75	0.80	2.90	1.82	1.30
8	0.75	0.72	2.53	1.45	1.20
9	0.75	0.54	2.54	1.31	1.10
10	0.75	0.50	2.45	1.46	1.00
11	0.75	0.59	2.19	1.53	0.95
12	0.75	0.56	1.76	1.32	0.90
13	0.75	0.33	1.70	1.16	0.85
14	0.75	0.41	1.78	1.14	0.80
15 & Over	0.75	0.14	1.64	0.87	0.75

The following table provides the same information for Safety members. The actual average merit and promotional increases for the most recent three-year period and the prior three-year period were reduced by the actual average inflation plus real "across the board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year of the current and prior three-year experience periods (2.67% and 1.02%, respectively, on average).

Safety

Years of Service	Current Assumptions	2009-2012 Actual Average Merit and Promotional Increases	2012-2015 Actual Average Merit and Promotional Increases	2009-2015 Actual Average Merit and Promotional Increases	Proposed Assumptions
Less than 1	8.00%	7.97%	10.98%	10.32%	8.50%
1	5.75	4.91	8.13	6.69	6.25
2	5.00	4.68	5.98	5.12	5.00
3	4.75	4.61	6.43	5.03	4.75
4	4.25	4.08	6.21	5.06	4.50
5	1.00	3.27	4.44	4.04	2.25
6	1.00	2.54	2.91	2.80	1.60
7	1.00	1.21	2.03	1.68	1.40
8	1.00	0.17	1.42	0.72	1.20
9	1.00	1.74	2.86	2.19	1.10
10	1.00	0.43	1.94	1.09	1.00
11	1.00	0.03	1.51	0.71	1.00
12	1.00	0.17	1.16	0.63	1.00
13	1.00	0.46	1.60	1.02	1.00
14	1.00	0.31	1.38	0.90	1.00
15 & Over	1.00	0.29	1.70	1.03	1.00

Charts 26 and 27 provide a graphical comparison of the current assumed, actual, and proposed assumed merit and promotional increases. Chart 26 shows this information for General members and Chart 27 for Safety members.

We made relatively modest adjustment to the assumptions recommended for both General and Safety member even though the data for 2012-2015 might appear to support higher assumptions. Our model to study this assumption is heavily dependent on the actual average inflation plus “across the board” increase observed during the experience study period. In an environment where that increase averaged significantly lower than the assumed inflationary increase, it could produce anomalous results. This is also one of the reasons why we chose to incorporate results for the prior 2009-2012 period.

Based on this experience, we are proposing slight increases in the merit and promotional salary increases for both General and Safety members in their earlier employment.

Chart 26
Merit and Promotional Salary Increase Rates for General Members

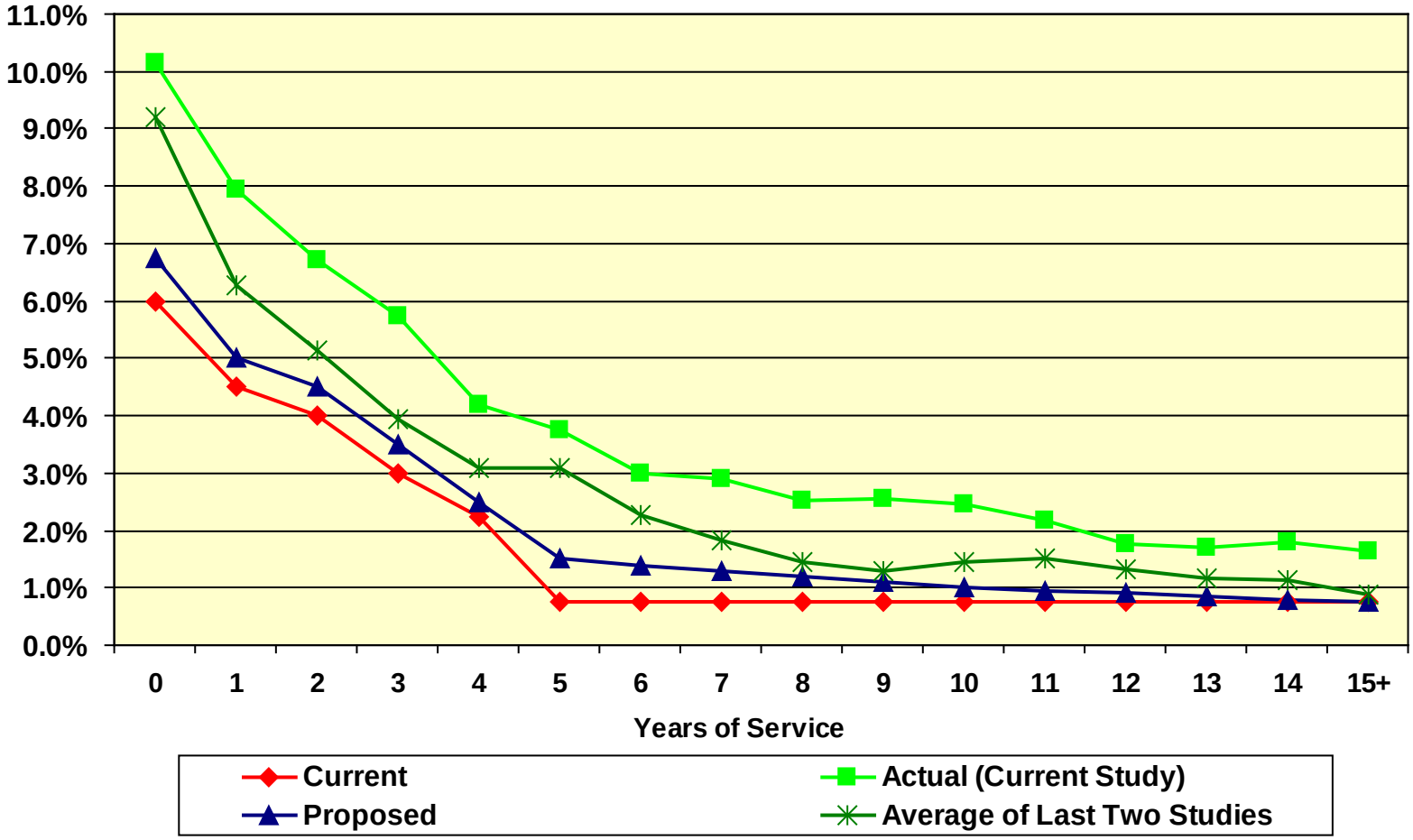
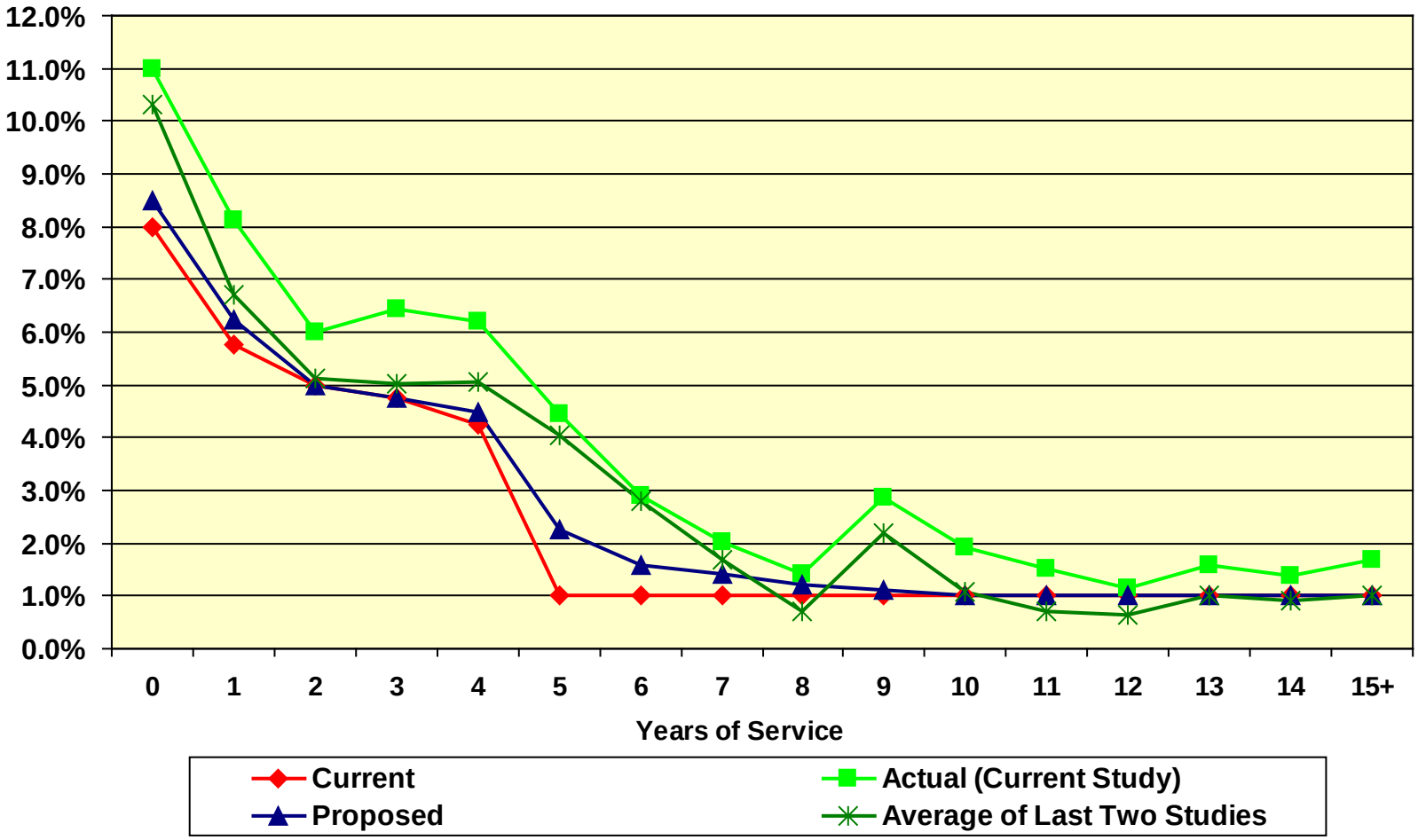


Chart 27
Merit and Promotional Salary Increase Rates for Safety Members



G. SICK LEAVE CONVERSION AND PREMIUM PAY ASSUMPTIONS

Conversion of Unused Sick Leave to Pension Service Credit at Retirement

It is currently assumed that the sick leave conversion rate[15] at retirement is 2.00% and 2.25% for General and Safety members, respectively. Upon reviewing actual data for those retired in 2014/2015, the conversions were adding about 2.05% and 2.27% to the total service for General and Safety members, respectively. Therefore, we recommend maintaining the current sick leave conversion assumption of 2.00% and 2.25% for General and Safety members, respectively.

Premium Pay Elements

It is currently assumed that the 1.25% premium pay assumption applied to both General and Safety members (including members in the CalPEPRA Tiers) would account for the "other premium pay elements" not reflected in the individual annualized hourly rates otherwise reported by SDCERA and used in our annual valuation. Upon reviewing the actual data for active members as of June 30, 2015, we recommend the following premium pay assumptions be used instead to estimate the impact of "other premium pay elements" not reported in the hourly rate. Based on input from SDCERA and on clarification by the County, it is our understanding that one of the premium pay elements "County Lump Sum" is anticipated to drop from $15 million for FY 14-15 to below $0.5 million in future years due to the ad-hoc nature of most of those payments made in FY 14-15. We have reflected that expectation in developing the premium pay assumption as shown below.

Other Premium Pay Elements not Included in the Individual Hourly Rates Based on Active Members as of June 30, 2015

	% of Annualized Hourly Rates		
Membership	Current Rate	Observed Rate[16]	Proposed Rate
General Non Tier C	1.25%	1.36%	1.25%
General Tier C	1.25	0.99	1.00
Safety Non Tier C	1.25	1.85	1.50
Safety Tier C	1.25	0.35	0.75

[15] For instance, a member who retired from General after 20 years of employment would actually have 20.4 years of pension service for retirement purposes.

[16] Excluded about $14.5 million "County Lump Sum" as those amounts were deemed to be an one-time payments by the County.

V. COST IMPACT OF ASSUMPTION CHANGES

The tables below show the changes in the employer and member contribution rates due to the recommended assumption changes as if they were applied in the June 30, 2015 actuarial valuation. If all of the proposed assumption changes were implemented, the Plan's average employer rate would have increased by 5.38% of payroll while the average member rate would have increased by 0.68% of payroll. The Plan's UAAL would have increased by $748.5 million.

Employer Contribution Rate Impact (% of Payroll)

Contributions	General	Safety	Total
Normal Cost	0.65%	1.15%	0.77%
UAAL	3.54%	7.84%	4.61%
Total	4.19%	8.99%	5.38%

Employer Contribution Rate Impact (Estimated Annual Dollar Amounts in Thousands)

Contributions*	General	Safety
Total	$36,777	$25,678

** Based on General and Safety member payrolls of $877,739,000 and $285,624,000, respectively, as used in the June 30, 2015 valuation.*

Increase in Average Member Contribution Rate Impact (% of Payroll)

	Change		Change
General Tier 1	0.69%	Safety Tier A	1.05%
General Tier A	0.61%	Safety Tier B	0.64%
General Tier B	0.48%	Safety Tier C	0.78%
General Tier C	0.46%		

The increase in the rates is primarily due to the increase in liabilities for active and retirees from the change in economic assumptions and the anticipated improvement in life expectancy, offset to some degree by other assumption changes. We note that, separate from the demographic assumption changes, changing the economic assumptions (i.e., reducing investment return and across the board real pay increases assumptions) would have increased the average employer rate by 2.53% of payroll[17] (consisting of 0.46% in Normal Cost and 2.07% in UAAL) and increased the average member rate by 0.37% of payroll.

[17] The increase would be 2.29% and 3.25% for General and Safety, respectively.

APPENDIX A

CURRENT ACTUARIAL ASSUMPTIONS

Investment Return:	7.50%
Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3% maximum change per year for Tier 1 and Tier A, and 2% maximum change per year for Tier B and Tier C.
Post-Retirement Mortality Rates	
Healthy:	General Members and Beneficiaries – RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 with a two-year age setback for Males and a one-year age setback for Females.
	Safety Members and Beneficiaries – RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 with a one-year age setback for Males and no age setback for Females.
Disabled:	General Members – RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 with a three-year age set forward.
	Safety Members – RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 with a three-year age set forward.
Member Contribution Rates:	For General members, RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 for Males with a two-year age setback weighted 30% and RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 for Females with a one-year age setback weighted 70%.
	For Safety members, RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 for Males with a one-year age setback weighted 75% and RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 for Females with no age set back weighted 25%.

Termination Rates Before Retirement:

Mortality Rates:

General: Same as Post-Retirement Healthy Mortality Rates for retired General members (i.e., RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 with a two-year age setback for Males and a one-year age setback for Females.)

Safety: Same as Post-Retirement Healthy Mortality Rates for retired Safety members (i.e., RP-2000 Combined Healthy Mortality Table projected with Scale AA to 2016 with a one-year age setback for Males and no age setback for Females.)

Rate (%)

Mortality

	General		Safety	
Age	Male	Female	Male	Female
25	0.03	0.02	0.03	0.02
30	0.04	0.02	0.04	0.02
35	0.06	0.04	0.06	0.04
40	0.09	0.05	0.09	0.06
45	0.11	0.08	0.12	0.09
50	0.14	0.12	0.15	0.13
55	0.21	0.21	0.23	0.24
60	0.41	0.41	0.46	0.47
65	0.80	0.80	0.90	0.90
70	1.43	1.37	1.58	1.55

For General members, all pre-retirement deaths are assumed to be non-service connected. For Safety members, all pre-retirement deaths are assumed to be service connected.

Disability Rates:

Rate (%)

	Non Service Connected Disability			Service Connected Disability		
	General			General		
Age	Male	Female	Safety	Males	Female	Safety
20	0.00	0.00	0.00	0.01	0.00	0.03
25	0.00	0.00	0.00	0.01	0.01	0.08
30	0.01	0.01	0.00	0.01	0.03	0.19
35	0.02	0.02	0.02	0.03	0.06	0.49
40	0.04	0.06	0.06	0.06	0.09	0.65
45	0.06	0.10	0.07	0.16	0.14	0.65
50	0.10	0.14	0.07	0.23	0.17	1.22
55	0.18	0.17	0.07	0.28	0.25	1.96
60	0.22	0.22	0.07	0.33	0.30	2.26
65	0.22	0.25	0.03	0.20	0.18	2.72

Withdrawal Rates:

	Rate (%)		
	Termination (< 5 Years of Service)*		
	General		
Years of Service	Male	Female	Safety
0	13.50	14.50	11.50
1	8.25	9.25	8.00
2	5.70	6.50	4.00
3	4.30	6.00	3.00
4	4.05	5.50	2.75

* 60% of all terminating members will choose a refund of contributions and 40% will choose a deferred vested benefit.

	Rate (%)		
	Termination (5+ Years of Service) **		
	General		
Age	Male	Female	Safety
20	5.46	5.43	3.71
25	4.56	5.23	3.19
30	4.08	4.64	2.62
35	3.54	3.79	2.00
40	2.69	2.88	1.35
45	2.31	2.35	1.08
50	2.42	2.25	1.00
55	2.50	2.25	1.22
60	2.50	2.25	1.58
65	2.50	2.25	0.68

** 15% of all terminating members will choose a refund of contributions and 85% will choose a deferred vested benefit. Termination rates are zero at ages where members are expected to retire.

Retirement Rates:

Rate (%)

	Retirement					
Age	General (Tier 1 and Tier A)	General (Tier B)	General (Tier C)	Safety (Tier A)	Safety (Tier B)	Safety (Tier C)
48	-	-	-	4.0	3.0	-
49	55.0	-	-	8.0	3.5	-
50	7.0	-	-	14.0	11.0	14.0
51	5.0	-	-	12.0	11.0	9.5
52	5.0	-	-	12.0	11.0	9.5
53	5.0	-	-	15.0	11.0	9.5
54	6.0	-	-	15.0	12.0	10.5
55	11.0	5.5	4.0	16.0	19.0	16.5
56	11.0	6.5	4.5	18.0	22.0	19.0
57	11.0	7.5	5.5	20.0	20.0	20.0
58	12.0	7.5	5.5	21.0	21.0	21.0
59	15.0	7.5	5.5	22.0	22.0	22.0
60	20.0	10.0	7.5	25.0	25.0	25.0
61	20.0	13.0	10.0	30.0	30.0	30.0
62	24.0	19.0	14.0	30.0	30.0	30.0
63	25.0	19.0	15.0	30.0	30.0	30.0
64	28.0	19.0	16.0	30.0	30.0	30.0
65	31.0	30.0	26.0	60.0	60.0	60.0
66	31.0	30.0	30.0	60.0	60.0	60.0
67	31.0	30.0	30.0	60.0	60.0	60.0
68	35.0	30.0	30.0	60.0	60.0	60.0
69	37.0	30.0	30.0	60.0	60.0	60.0
70	50.0	50.0	50.0	100.0	100.0	100.0
71	50.0	50.0	50.0	100.0	100.0	100.0
72	50.0	50.0	50.0	100.0	100.0	100.0
73	50.0	50.0	50.0	100.0	100.0	100.0
74	50.0	50.0	50.0	100.0	100.0	100.0
75+	100.0	100.0	100.0	100.0	100.0	100.0

Retirement Age and Benefit for Deferred Vested Members:

Reciprocal and Non-Reciprocal Members:

General:	Age 57
Safety:	Age 51

We assume that 25% of General and 30% of Safety future deferred vested members will continue to work for a reciprocal employer. For these members, we assume 4.50% and 4.75% compensation increases per annum for General and Safety members, respectively.

Future Benefit Accruals: 1.0 year of service per year.

Percent Married: 75% of male members; 55% of female members.

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

Individual Salary Increases:

Annual Rate of Compensation Increase

Inflation: 3.00% per year; plus "across the board" salary increases of 0.75% per year; plus the following merit and promotional increases:

Years from Hire Date	General	Safety
0	6.00%	8.00%
1	4.50	5.75
2	4.00	5.00
3	3.00	4.75
4	2.25	4.25
5+	0.75	1.00

Pay for Performance and Other Premium Pays:

All General members (members in legacy tiers and members in CalPEPRA tiers) are assumed to be eligible for an average annual pay for performance and other premium pay of 1.25%.

All Safety members (members in legacy tiers and members in CalPEPRA tiers) are assumed to be eligible for an average annual pay for performance and other premium pay of 1.25%.

Service Converted From Unused Sick Leave:

The following assumptions for service converted from unused sick leave as a percentage of service at retirement are used:

General:	2.00%
Safety:	2.25%

Pursuant to Section 31641.02, the cost of this benefit for Non-Tier C members will be charged only to employers and will not affect member contribution rates.

APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS

Investment Return:	7.25%
Consumer Price Index:	Increase of 3.00% per year, retiree COLA increases due to CPI subject to a 3% maximum change per year for Tier 1 and Tier A, and 2% maximum change per year for Tier B and Tier C.
Post-Retirement Mortality Rates	
Healthy:	For General Members and all Beneficiaries: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females. For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years.
Disabled:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward five years for males and four years for females. For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year.
Pre-Retirement Mortality Rates	For General and Safety Members: Headcount-Weighted RP-2014 Employee Mortality Table projected 20 years with the two-dimensional scale MP2015D times 75%. For General, all pre-retirement deaths are assumed to be non-service connected death while for Safety, all pre-retirement deaths are assumed to be service connected death.
Member Contribution Rates:	For General Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set forward one year for females weighted 30% male and 70% female. For Safety Members: Headcount-Weighted RP-2014 Healthy Annuitant Mortality Table projected 20 years with the two-dimensional scale MP2015D, set back two years weighted 75% male and 25% female.

Termination Rates Before Retirement:

Mortality Rates:

General and Safety:

Headcount-Weighted RP-2014 Employee Mortality Table projected 20 years with the two-dimensional scale MP2015D times 75%.

Rate (%)

Mortality

	General		Safety	
Age	Male	Female	Male	Female
25	0.03	0.01	0.03	0.01
30	0.03	0.02	0.03	0.02
35	0.04	0.02	0.04	0.02
40	0.04	0.03	0.04	0.03
45	0.07	0.05	0.07	0.05
50	0.11	0.08	0.11	0.08
55	0.20	0.13	0.20	0.13
60	0.35	0.19	0.35	0.19
65	0.60	0.27	0.60	0.27

For General members, all pre-retirement deaths are assumed to be non-service connected. For Safety members, all pre-retirement deaths are assumed to be service connected.

Disability Rates:

	Rate (%)			
	Non-Service Connected Disability		Service Connected Disability	
Age	General	Safety	General	Safety
20	0.00	0.00	0.00	0.03
25	0.00	0.00	0.01	0.08
30	0.01	0.00	0.03	0.18
35	0.02	0.05	0.04	0.33
40	0.05	0.08	0.06	0.52
45	0.09	0.08	0.13	0.63
50	0.11	0.08	0.17	1.22
55	0.14	0.10	0.26	1.84
60	0.17	0.12	0.31	2.30
65	0.22	0.05	0.23	2.50

Withdrawal Rates:

	Rate (%)	
	Termination (< 5 Years of Service)*	
Years of Service	General	Safety
0	11.75	9.00
1	8.50	7.00
2	7.00	4.00
3	5.75	3.00
4	5.50	2.90

* 65% of all terminating members will choose a refund of contributions and 35% will choose a deferred vested benefit.

	Rate (%)	
	Termination (5+ Years of Service) **	
Age	General	Safety
20	5.35	3.30
25	4.84	3.12
30	4.20	2.40
35	3.64	1.76
40	2.86	1.24
45	2.44	0.88
50	2.40	1.04
55	2.40	1.08
60	2.40	1.00
65	2.40	0.40

** 20% of all terminating members will choose a refund of contributions and 80% will choose a deferred vested benefit. Termination rates are zero at ages where members are expected to retire.

Retirement Rates:

Rate (%)

	Retirement					
Age	General (Tier 1 and Tier A)	General (Tier B)	General (Tier C)	Safety (Tier A)	Safety (Tier B)	Safety (Tier C)
45	-	-	-	2.0	2.0	-
46	-	-	-	2.0	2.0	-
47	-	-	-	2.0	2.0	-
48	-	-	-	3.0	3.0	-
49	65.0	-	-	9.0	3.5	-
50	6.0	-	-	14.0	11.0	14.0
51	4.0	-	-	12.0	11.0	9.5
52	4.0	-	-	11.0	10.0	9.5
53	5.0	-	-	15.0	11.0	9.5
54	6.0	-	-	15.0	12.0	10.5
55	10.0	5.0	4.0	15.0	19.0	16.5
56	10.0	6.0	4.5	18.0	22.0	19.0
57	10.0	7.0	5.5	18.0	20.0	20.0
58	11.0	7.0	5.5	19.0	20.0	20.0
59	15.0	7.0	5.5	20.0	20.0	22.0
60	18.0	9.0	7.0	22.0	22.0	22.0
61	20.0	13.0	10.0	25.0	25.0	25.0
62	23.0	19.0	14.0	25.0	25.0	25.0
63	24.0	19.0	15.0	25.0	25.0	25.0
64	25.0	19.0	15.0	25.0	25.0	25.0
65	31.0	30.0	26.0	50.0	50.0	50.0
66	35.0	30.0	30.0	50.0	50.0	50.0
67	33.0	30.0	30.0	50.0	50.0	50.0
68	32.0	30.0	30.0	50.0	50.0	50.0
69	31.0	30.0	30.0	50.0	50.0	50.0
70	35.0	35.0	35.0	100.0	100.0	100.0
71	35.0	35.0	35.0	100.0	100.0	100.0
72	35.0	35.0	35.0	100.0	100.0	100.0
73	35.0	35.0	35.0	100.0	100.0	100.0
74	40.0	40.0	40.0	100.0	100.0	100.0
75+	100.0	100.0	100.0	100.0	100.0	100.0

Retirement Age and Benefit for Deferred Vested Members:

Reciprocal and Non-Reciprocal Members:

General: Age 57

Safety: Age 51

We assume that 20% of General and 30% of Safety future deferred vested members will continue to work for a reciprocal employer. For these members, we assume 4.25% and 4.50% compensation increases per annum for General and Safety members, respectively.

Future Benefit Accruals: 1.0 year of service per year.

Percent Married: 75% of male members; 55% of female members.

Age of Spouse: Male retirees are 3 years older than their spouses, and Female retirees are 2 years younger than their spouses.

Individual Salary Increases:

Annual Rate of Compensation Increase

Inflation: 3.00% per year; plus "across the board" salary increases of 0.50% per year; plus the following merit and promotional increases:

Years of Service	General	Safety
0	6.75%	8.50%
1	5.00	6.25
2	4.50	5.00
3	3.50	4.75
4	2.50	4.50
5	1.50	2.25
6	1.40	1.60
7	1.30	1.40
8	1.20	1.20
9	1.10	1.10
10	1.00	1.00
11	0.95	1.00
12	0.90	1.00
13	0.85	1.00
14	0.80	1.00
15+	0.75	1.00

Pay for Performance and Other Premium Pays:

All General members in legacy tiers are assumed to be eligible for an average annual pay for performance and other premium pay of 1.25%.

All General members in CalPEPRA tiers are assumed to be eligible for an average annual pay for performance and other premium pay of 1.00%.

All Safety members in legacy tiers are assumed to be eligible for an average annual pay for performance and other premium pay of 1.50%.

All Safety members in CalPEPRA tiers are assumed to be eligible for an average annual pay for performance and other premium pay of 0.75%.

Service Converted From Unused Sick Leave:

The following assumptions for service converted from unused sick leave as a percentage of service at retirement are used:

General:	2.00%
Safety:	2.25%

Pursuant to Section 31641.02, the cost of this benefit for Non-Tier C members will be charged only to employers and will not affect member contribution rates.

5421987v3/05536.119