



Benefits, Compensation and HR Consulting

**University of California
Retirement Plan**

ACTUARIAL EXPERIENCE STUDY

**Analysis of Actuarial Experience
During the Period
July 1, 2006 through June 30, 2010**

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THE SEGAL COMPANY
100 Montgomery Street, Suite 500 San Francisco, CA 94104-4308
T 415.263.8200 F 415.263.8290 www.segalco.com

June 13, 2011

Mr. Dwaine B. Duckett
University of California
Vice President, Human Resources
1111 Franklin Street, 5th Floor
Oakland, California 94607

Re: Review of Actuarial Assumptions for the July 1, 2011 Actuarial Valuation

Dear Vice President Duckett:

We are pleased to submit this report of our review of the actuarial experience of the University of California Retirement Plan (UCRP or Plan). This study utilizes the census data of the last five actuarial valuations to analyze the demographic experience for the four-year period ending on June 30, 2010. It includes the proposed actuarial assumptions, both demographic and economic, to be used in future actuarial valuations starting with the July 1, 2011 actuarial 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
Senior Vice President and Actuary

John Monroe, ASA, EA, MAAA
Vice President and Associate Actuary

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I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS

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

If assumptions are modified, the total funding policy contribution rate is 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 funded status than recognizing gains or losses as they occur.

The use of realistic actuarial assumptions is important in maintaining adequate funding, while paying the promised benefit amounts to members already retired and to those near retirement. These assumptions will also be utilized in estimating future costs and projecting the funded status of the Plan. Therefore, matching the assumptions as closely as possible to expected Plan experience will best inform planning for setting contribution amounts to the Plan.

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 members and funding sources.

This study was undertaken in order to review the economic and demographic actuarial assumptions and to compare the actual experience with that expected under the current assumptions during the four-year experience period from July 1, 2006 through June 30, 2010. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27, "Selection of Economic Assumptions for Measuring Pension Obligations" and ASOP No. 35, "Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations." These Standards of Practice put forth guidelines for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected near-term experience, we are recommending various changes in the current actuarial assumptions.

Many of the proposed demographic assumptions were a joint effort between Segal and Deloitte Consulting (consulting actuary for the retiree health plan). To the extent possible, we incorporated both retiree health and pension considerations into the proposed assumptions.

We are recommending changes in the assumptions for real (“across the board”) salary increases, promotional and merit salary increases, retirement from active membership, non-disabled (healthy) life mortality, disabled life mortality, termination, disability incidence, service from unused sick leave conversion and Lump Sum Cashout take-rate.

In some cases we have changed the structure of the assumption. For example, we observe that termination rates correlate better with years of service than with age. Therefore, the proposed assumptions for termination rates are by years of service instead of by age, which was the current practice. We also found that retirement rates for Staff members also correlate well with years of service in addition to age and so our proposed assumption is based on both variables.

Our recommendations for the actuarial assumption categories for the University of California Retirement Plan (UCRP or Plan) are as follows:

Inflation – Future increases in the Consumer Price Index (CPI) which drive investment returns and active member salary increases, as well as cost-of-living adjustments (COLAs) for retired members.

Recommendation: Maintain the rate at 3.50% per annum as discussed in Section III(A).

Investment Return – The estimated average future net rate of return on assets over the projected lifetime of the Plan as of the valuation date. This rate is used to discount liabilities.

Recommendation: Maintain the rate at 7.50% per annum as discussed in Section III(B).

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
- Promotional and merit increases.

Recommendation: Maintain the current inflationary salary increase at 3.50% and increase the real “across the board” salary increase from 0.25% to 0.50%, as discussed in Section III(C). This means that the combined inflationary and real across the board salary increases will increase from 3.75% to 4.00%.. In addition, reduce the promotional and merit increases to those developed in Section III(C).

Retirement Rates – The probability of retirement at each age at which members are eligible to retire.
Recommendation: For active members, adjust the current retirement rates to those developed in Section IV(A). For active Staff members, the rates will also depend on years of service in addition to age. For deferred vested members, maintain the assumed retirement age of 59.

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

Recommendation: For non-disabled (healthy) pensioners, decrease the mortality rates by using the RP-2000 Combined Healthy Mortality Tables projected to 2025 with a two-year set back as developed in Section IV(B). For disabled pensioners, decrease the mortality rates by using the RP-2000 Disabled Retiree Mortality Tables projected to 2025 with a two-year set back for males and no set back for females as developed in Section IV(C). For pre-retirement mortality, use the same mortality tables that are used for healthy pensioners.

Termination Rates – The probability of leaving active membership at each age and receiving either a refund of member contributions (“accumulations”) or a deferred vested retirement benefit.

Recommendation: Implement service-based termination rates and increase the current termination rates overall to those developed in Section IV(D). In addition, implement a new assumption that a member will choose between a refund of contributions and a deferred vested benefit based on which option has the greater present value at termination.

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

Recommendation: Decrease the current disability rates overall to those developed in Section IV(E).

Eligible Survivor Assumptions – The probability of having a survivor at death.

Recommendation: Maintain the current percentages for Eligible Survivors, as described in Section IV(F). Also, maintain the current assumption for number of Eligible Survivors per Active Member with Eligible Survivors.

Service from Unused Sick Leave Conversion – Increases in Service Credit due to conversion of unused sick leave.

Recommendation: Slightly decrease the current assumption for Faculty and Safety members retiring from active membership and slightly increase the current assumption for Staff members retiring from active membership, as developed in Section IV(G).

Lump Sum Cashout Take-Rate – The probability of electing a Lump Sum Cashout at retirement.
Recommendation: For active members, implement service-based take-rates and adjust the assumption as described in Section IV(H). For deferred vested members, maintain the assumption of 45% of members electing a Lump Sum Cashout. For retiree “crossovers” from disability status, increase the assumption from 12% to 13% of members electing a Lump Sum Cashout as described in Section IV(H).

Future Benefit Accruals – Amount of Service Credit projected to be earned by active members in years after the valuation date.

Recommendation: No change to assuming that all active members earn one year of Service Credit each year in the future, as discussed in Section IV(I).

Administrative Expenses – Fees for administrative, legal, accounting, and actuarial services, and other functions carried out by the Plan.

Recommendation: No change to the percentage loading to the normal cost of 0.50% of payroll, as developed in Section IV(J).

We also suggest that for any assumption changes being recommended for UCRP, the assumption will also be changed for the University of California 415(m) Restoration Plan and the PERS Plus 5 Plan actuarial valuations, as applicable. The main exception to this is for the administrative expense assumptions where these two Plans will continue to have their own distinct assumptions.

Section II provides some background on basic principles and the methodology used for the experience study and for the review of economic and demographic actuarial assumptions. A detailed discussion of each assumption and reasons for the proposed changes is found in Section III for the economic assumptions and Section IV for the demographic assumptions. Section V shows the cost impact of the proposed changes.

Note that if these assumptions are adopted by the Board of Regents, then the annuity option factors and Lump Sum Cashout factors should be reviewed for consistency with the assumptions proposed in this report. Based on our proposed change to the mortality assumptions, we have also included a proposed mortality table to use in the determination of the annuity option factors and Lump Sum Cashout factors. We would propose that a July 1, 2012 effective date be used for the changes to the annuity option factors and Lump Sum Cashout factors.

We have estimated the impact of the proposed assumption changes (including the effect of the proposed changes to the assumptions used for annuity option factors and Lump Sum Cashout factors) as if they were applied to the July 1, 2010 actuarial valuation. If all of the proposed assumption changes were implemented, the Plan's Normal Cost as a dollar amount would have increased by \$14 million (1.0%) and the Actuarial Accrued Liability (AAL) would have increased by \$1.77 billion (3.7%). The total funding policy contribution would have increased from 23.25% to 25.50% of payroll.

The change to the mortality table was significant as it increased the Normal Cost by 0.5% of payroll and the AAL by \$1.6 billion. Changes to the assumptions for termination rates and disability incidence offset most of this increase in Normal Cost, but only slightly offset this increase in AAL. We stress that this is an illustration based on applying the proposed assumptions to the previous valuation (2010).

II. BACKGROUND AND METHODOLOGY

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

Investment Return – Expected return on the Plan’s investments after expenses. This assumption has a significant impact on the total funding policy contribution rate.

Salary Increases – In addition to inflationary increases, it is assumed that salaries will also grow by real “across the board” pay increases in excess of price inflation. It is also assumed that active members will receive raises from promotions and step increases. These are sometimes referred to as promotional and merit increases.

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

Demographic Assumptions

In order to determine the probability of an event occurring, we examine the “decrements” and “exposures” of that event. For example, taking termination from service, we compare the number of active members 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 members 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 was $50 \div 500$ 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.

Please note that any active member experience during the four-year period for members who worked at the Los Alamos National Laboratory (LANL) or the Lawrence Livermore National Laboratory (LLNL) was excluded from the determination of any prospective assumptions that affect active members. This is because there are currently no active members in UCRP working at LANL or LLNL. We believe that in general it would not be appropriate to include the experience for a subset of the Plan's active members in developing assumptions for future events when that subset of members is no longer active in the Plan. We also believe we should not let these extraordinary one-time events impact the proposed assumptions.

Similarly, the temporary Furlough/Salary Reduction Plan approved by The Regents in July 2009 also occurred during the four-year experience study period. The salary and service credit data upon which this experience study is based excludes the temporary Furlough/Salary Reduction Plan. This is because of the temporary nature of the Furlough/Salary Reduction Plan and also due to the amendment to UCRP adopted by The Regents to ensure that the Furlough/Salary Reduction Plan has no impact on the calculation of member benefits.

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 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 2010
(U.S. City Average - All Urban Consumers)

	25 th Percentile	Median	75 th Percentile
15-year moving averages	2.7%	3.5%	4.8%
30-year moving averages	3.3%	4.2%	5.0%

The average inflation rates have continued to decline gradually over the last several years due to the relatively low inflationary period in the 1990s and early 2000s. Also, the later of the 15-year averages during the period are lower as they do not include the high inflation years of the mid-1970s and early 1980s.

The current inflation assumption of 3.50% is comparable to most retirement systems, not only in California, but nationally. Here are some relevant comparisons:

System	Inflation Assumption
Los Angeles City Employees Retirement System	3.75%
Los Angeles City Fire & Police Pensions	3.50%
Los Angeles County Employees’ Retirement Association	3.50%
CalPERS	3.00%
Median from NASRA 2010 Public Fund Survey	3.50%

Regarding the last entry, in a 2010 public fund survey published by the National Association of State Retirement Administrators (NASRA), the median inflation assumption used by 125 large public retirement funds in their 2009 actuarial valuations was 3.50%.

UCRP's investment consultant, Mercer Investment Consulting, anticipates an annual inflation rate of 2.8%. Note that in general, the investment consultants' time horizon for this assumption is shorter than the time horizon used in the actuarial valuation.

Based on all of the above information, we recommend that the current 3.50% annual inflation assumption be maintained at 3.50% for the July 1, 2011 actuarial valuation.

Note that the UCRP Cost-of-Living Adjustment (COLA) provision for annuitants generally provides for 100% of Consumer Price Index (CPI) increases up to 2% per year plus 75% of CPI increases above 4% per year. This means that based on the 3.50% inflation assumption being recommended we will continue to value this COLA provision as a flat 2% per year.

B. INVESTMENT RETURN

Investment return is an important component in the pension funding equation: contributions plus investment return equals benefits plus expenses. The investment return assumption is intended to reflect the long-term return that will be achieved on the Plan's assets in future years. The use of a higher investment return assumption increases the risk that the Plan will not achieve its assumed return over the long run, causing a future shortfall of Plan assets and an increase in total funding policy contributions. Conversely, a lower investment return assumption increases the chance that the Plan will exceed its assumed return over the long run, leading to more than expected Plan assets and a decrease in total funding policy contributions.

Since no amount of analysis can predict future returns with certainty, setting the investment return assumption generally involves considering an acceptable range of expected returns and then selecting a specific point within that range consistent with the Plan's tolerance of the risks described just above.

Historical Returns

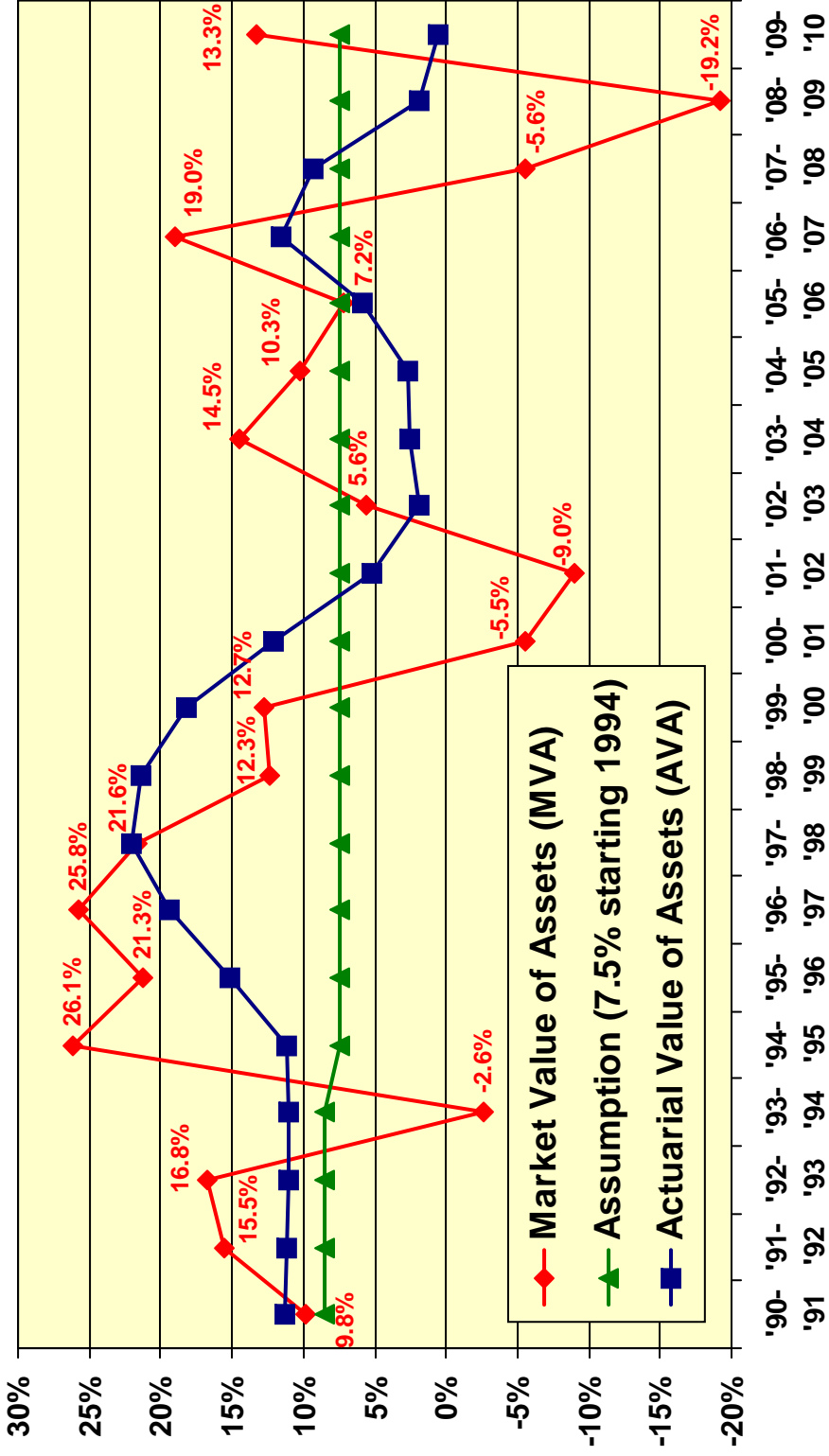
For reference, UCRP actual rates of return from July 1, 1990 through June 30, 2010, on a market and actuarial basis, are shown in Chart 1, along with the assumed earnings rates during that same period.

Please note that while historical Plan performance is one data element that may be reviewed, caution should be exercised to avoid relying on that data too heavily. The relevant Actuarial Standard of Practice (ASOP No. 27, Section 3.3) states with regard to selecting any of the economic assumptions:

“[T]he actuary should consider recent economic data. However, the actuary should not give undue weight to recent experience. For example, if the recent history was largely attributable to a significant change in bond yields or inflation, it may be unreasonable to assume that such investment returns will continue over the measurement period.”

This Standard is particularly relevant when setting the investment return assumption because UCRP's investment experience over the past twenty years has been heavily influenced by extraordinary investment market events, including periods of unprecedented market gains and losses. For that reason, our investment return assumption is not explicitly based on the actual return history of UCRP.

Chart 1
Historical UCRP Investment Rates of Return



However, these returns do provide information about the historical practice of The Regents regarding its selection of a specific investment return assumption. The Regents adopted the 7.50% earnings assumption in 1994 and maintained that assumption during the 1990s when market returns were very high and many funds were increasing their earnings assumptions. It has also been maintained throughout the 2000s during which several years of market losses were experienced.

Comparison with Other Public Retirement Systems

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

The following table compares the current UCRP net investment return assumption against a sample of large California state, county and city public retirement systems:

Assumption	Current UCRP	Sample California Public Retirement Systems*		
		Low	Median	High
Net Investment Return	7.50%	7.50%	7.75%	8.00%

* Includes CalPERS, UCRP, 13 county systems and 7 major city/municipal systems

The next table compares the current UCRP net investment return assumption against those of 126 nationwide public retirement systems that participated in the National Association of State Retirement Administrators (NASRA) 2010 Public Fund Survey:

Assumption	Current UCRP	NASRA 2010 Public Fund Survey		
		Low*	Median	High
Net Investment Return	7.50%	7.25%	8.00%	8.50%

* After eliminating the very lowest as an outlier

Based on the above, the current investment return assumption of 7.50% falls toward the lower end of a reasonable range when compared to other retirement systems. This provides relatively greater protection against the risk of future asset shortfalls and future increases in the total funding policy contributions. This is consistent with The Regents’ historical practice, noted above.

A “Risk Adjustment” Methodology

In addition to the historical perspective and comparisons against other public retirement systems, Segal’s standard approach for its California public sector plans is a more quantitative analysis that starts with the very common “building block method” (as described in ASOP No. 27, Section 3.6.2.a) which looks at the components of the investment return assumption: inflation, real rate of return and expenses. It then includes a “Risk Adjustment”, which is an empirically based method of measuring and comparing risk tolerances among different plans. We will develop each of these “building block” components in turn.

Inflation – As previously discussed in Section III(A), we are recommending a 3.50% inflation assumption.

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 also expected to 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 the UCRP portfolio will generally vary with The Regents’ asset allocation among asset classes.

The following table shows the UCRP target asset allocation and a set of expected real rates of return assumptions by asset class. The column of returns represents the average of a sample of real rate of return expectations. The sample includes the expected annual real rates of return provided to us by ten investment advisory firms retained by California public retirement systems. We believe these assumptions reasonably reflect a consensus forecast of long-term market returns.

**UCRP Target Asset Allocation and Assumed Arithmetic Real Rate of Return
Assumptions by Asset Class and for the Portfolio**

Asset Class	Percentage of Portfolio	Average Real Rate of Return from a Sample of Consultants to Segal's California Public Clients*
US Equity	23.0%	6.75%
Developed International Equity **	24.0%	6.89%
Emerging Market Equity	5.0%	9.29%
Core Fixed Income	12.0%	1.45%
High Yield Bonds	2.5%	3.74%
Emerging Market Debt	2.5%	4.02%
TIPS	8.0%	1.26%
Real Estate	7.0%	5.41%
Private Equity	6.0%	10.42%
Absolute Return/Hedge Funds/Real Assets	<u>10.0%</u>	<u>4.14%</u>
Total	100.0%	5.56%

* These are based on the projected arithmetic returns provided by the investment advisory firms serving the county retirement systems of Alameda, Contra Costa, Fresno, Orange, Sacramento, San Bernardino, San Diego and the LA City Employees' Retirement System, City of Fresno Retirement Systems and the LA Fire & Police Pensions. These return assumptions are gross of any applicable investment expenses.

** Includes a 2% allocation to Global Equity

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

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

The following are some observations about the returns provided above:

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 an average of expected real rates of return allows the Plan's investment return assumption to include a broader range of capital market information and it should help reduce year to year volatility in the Plan's investment return assumption.
3. Therefore, we recommend that the 5.56% portfolio real rate of return be used in this analysis of the UCRP investment return assumption. This is 0.34% lower than the corresponding real rate of return that was calculated four years ago. This is due to lower expected real returns by asset classes provided to us by the investment advisory firms.

Plan Expenses – The real rate of return assumption for the portfolio needs to be adjusted for investment expenses to be paid from investment income. Note that the valuation assumptions include a separate loading for administrative expenses, as discussed in Section IV(J) of this report.

We obtained information on investment expenses from the Treasurer's Office to be used in the setting of this assumption. Based on the average of the investment expenses for the years ending June 30, 2009 and June 30, 2010 it appears that a future investment expense assumption of 0.65% is reasonable.

Risk Adjustment – As noted above, this model adjusts the real rate of return assumption for the portfolio to reflect the potential risk of shortfalls in the return assumptions. The UCRP asset allocation also determines this portfolio risk, since risk levels are driven by the variability of returns for the various asset classes and the correlation of returns among those asset classes. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment, which in turn corresponds to a statistical confidence level of meeting or exceeding the assumed return.

The purpose of the risk adjustment (as measured by the corresponding confidence level) is to increase the likelihood of achieving the assumed investment return in the long term by factoring market volatility into the assumption. The 5.56% expected real rate of return developed earlier in this report was based on "mean" or average returns. This means there is a 50% chance of the actual return being at least as great as the average (assuming a symmetrical distribution of future returns). The risk adjustment increases that probability. This is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

Four years ago, The Regents adopted an investment return assumption of 7.50%. In combination with the inflation, real return and expense components from four years ago, that return implied a risk adjustment of 1.75%, reflecting a confidence level of 74% 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.¹

In our model, the confidence level associated with a particular risk adjustment represents the likelihood that the Plan's actual average return would equal or exceed the assumed value over a 15-year period. For example, if we set our real rate of return assumption using a risk adjustment that produces a confidence level of 60%, then 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 Plan's liabilities, where the duration of a liability represents the sensitivity of that liability to interest rate variations.

If we use the same 74% confidence level to set this year's risk adjustment based on the current long-term portfolio standard deviation of 13.97% provided by the Treasurer's Office (as determined by Mercer Investment Consulting), the result is a large risk adjustment of 2.40%. Together with the other investment return components, this produces a net investment return assumption of 6.01%, which is substantially lower than the current assumption of 7.50%. Alternatively, and for comparison, if the return assumption is left at 7.50% the corresponding risk adjustment of 0.91% represents a lower confidence level of 60%.

We note that the risk adjustment model and associated confidence level is most useful as a means for comparing how The Regents have positioned themselves over periods of time.² This range of values for the confidence level should be considered in context with other factors, including:

1. As noted above, the confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparison. The prior level of 74% was substantially higher than the corresponding values for Segal's other California public sector retirement system clients, which range from 55% to 62%.

¹ Based on an annual portfolio return standard deviation of 10.13% provided in 2007. 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.

² 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".

2. The confidence level is based on the standard deviation of the portfolio that is determined by UCRP's investment consultant and provided to us by the Treasurer's Office. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a "soft" number.
3. We also note that the reported standard deviation increased from around 10% to 14% between 2007 and 2011. This is a very large increase, and by itself accounts for about a 0.85% (85 basis points) reduction in the expected return or 6% (6 percentage points) of the decrease in the confidence level. Based on discussions with the Treasurer's Office, we understand that this change reflects a reassessment of the amount of risk taken on by the UCRP portfolio, where that reassessment is primarily a result of the significant market downturn during 2009.
4. As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the following "Test of Risk Adjustment" section that includes a discussion of the relationship between the inflation assumption and the risk adjustment.

Taking into account all of the above, our recommendation is to maintain the net investment return assumption at 7.50%. In terms of our "risk adjustment" methodology, this return implies a risk adjustment of 0.91% reflecting a confidence level of 60% that the actual average return over 15 years would not fall below the assumed return.

Recommended Investment Return Assumption

The following table provides the calculated net investment return assumption that results from the previous discussion.

<u>Components of the Net Investment Return Assumption</u>	
Assumption Component	Recommended Value
Inflation	3.50%
Plus Portfolio Real Rate of Return	5.56%
Minus Expense Adjustment	(0.65)%
Minus Risk Adjustment	<u>(0.91)%</u>
Total	7.50%

As noted above, Segal’s other California public retirement system clients have risk adjustments corresponding to confidence levels in the range of 55% to 62%. A 60% confidence level is a substantial reduction compared to the confidence level implicit in this assumption four years ago. However, it does continue to provide some protection against the risk of future returns falling short of the assumed return and future increases in the total funding policy contribution.

Test of the Risk Adjustment

The original development of the risk adjustment component of our investment earnings model arose from our experience with many retirement boards over many years. We consistently observed that combining the board’s inflation assumption with the real return and expense components (i.e., using no risk adjustment) produced – and produces – a substantially higher assumed return than what the boards actually adopt, regardless of the consulting actuary or the methods involved in the process. This led to the development of a risk adjustment component for our model.

There is a range of risk adjustment methodologies that may be incorporated in the development of an earnings assumption. Ideally, the particular risk adjustment selected should reflect the “downside” risk tolerance of the boards making the decision. This is similar to the volatility risk that boards consider when selecting an appropriate asset allocation.

In addition to the generally risk adverse attitude of retirement plan boards as noted above, we believe another reason for the use of a risk adjustment is to control the risk of overstating the effect of the inflation assumption on the assumed investment return. As noted earlier, the inflation assumption for

actuarial valuations is generally longer term than that used by investment consultants. For many years, that has led to higher actuarial valuation inflation assumptions. A higher inflation assumption has a conservative effect – higher current cost – on the wage increase and COLA assumption, but is less conservative as part of the investment earnings assumption. In effect, the risk adjustment compensates for this by offsetting the effect of the higher inflation assumption on assumed investment earnings.

One way to test the reasonableness of the risk adjustment incorporated in our recommendation is to compare our risk adjusted investment return (i.e., 7.50%) against the expected net investment return that would result from using the average of all the capital market assumptions – including the lower inflation assumptions – of the investment consultants in our sample.

The following table shows that comparison. It shows that the difference between our recommended return and that derived using the average of all the capital market assumptions of the investment consultants in our sample is relatively small, and can be attributed to the relationship between the two different inflation assumptions and the risk adjustment.

Assumption Element	Risk Adjusted Investment Return	Average of Investment Consultant Sample	Difference
Inflation	3.50%	2.66%	0.84%
Risk Adjustment	(0.91)%	0.00%	(0.91)%
Real Rate of Return	5.56%	5.56%	0.00%
Expenses	<u>(0.65)%</u>	<u>(0.65)%</u>	<u>0.00%</u>
Total	7.50%	7.57%	(0.07)%

The 0.07% (7 basis points) difference between the two calculations represents about a 1% greater confidence level under the risk adjusted method. This indicates that the risk adjustment more than offsets the effect of using an inflation assumption higher than that used in the capital market assumptions, and so produces a somewhat greater confidence level.

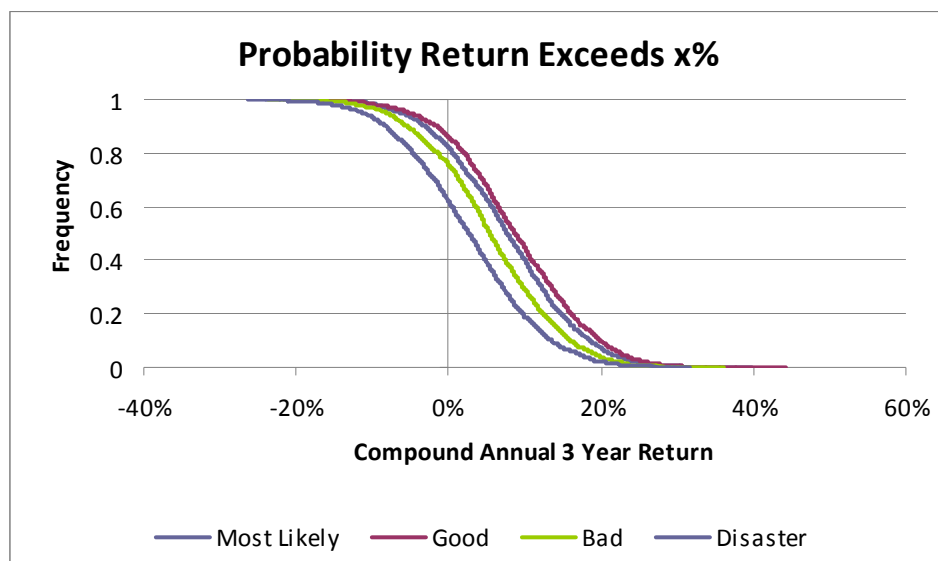
Finally, as one additional point of comparison, we did receive information from the Treasurer’s Office that was prepared by Mercer Investment Consulting and showed that based on their long-term capital market assumptions, the expected geometric mean return of the long-term UCRP asset allocation is 7.96%. We stress that this information was prepared not for purposes of setting the investment return

assumption, but rather for use in their role as investment consultant. Nonetheless, we observe that when adjusted for expenses this result is comparable to our recommendation.

Stochastic Approach

One common methodology for setting the actuarial investment rate of return assumption involves stochastic modeling. While this type of analysis is routinely used for asset allocation studies, we believe some caution should be exercised for using it to determine the actuarial investment rate of return assumption. This is because most often stochastic modeling is based entirely on a single set of capital market assumptions about the level and volatility of future returns. In other words, this approach involves setting one assumption based on another set of assumptions. Aside from the apparent circularity in this approach, this can lead to the undesired result of expected investment returns that vary significantly depending on which investment consultant develops the capital market assumptions used by a retirement plan. As discussed earlier in this report, this is why we use a broader average of capital market returns when using our risk adjustment model.

With that reservation noted, we did receive information from the Treasurer’s office on stochastic returns that were used solely for purposes of setting UCRP’s asset allocation. This stochastic modeling is scenario based and has a very short-term time horizon of three years. Four “most likely” economic scenarios were developed and asset returns were estimated for each scenario. A key component of that modeling was to examine the downside risk under each scenario. The four scenarios studied were described as “Most Likely”, “Good”, “Bad” and “Disaster”. The graph below shows the probability that a given level of compound annual geometric returns is exceeded over the three-year period.



The median compound annual geometric returns over the three-year period for each of these scenarios are respectively, 7.7%, 8.7%, 5.4% and 2.7%. This is indicative of the significant variation in expected returns among the four scenarios.

Besides the wide range of results, the other drawback of relying too heavily on this information for setting the actuarial investment rate of return assumption is that it is based on a very short time horizon (three years), which is much shorter than the duration over which the long-term actuarial investment rate of return assumption is used to project returns for a retirement plan. Nonetheless, these results are at least generally consistent with the 7.50% investment earnings assumption recommended above.

Conclusions and Recommendation

In summary:

- When compared to other systems, the 7.50% assumption is conservative and consistent with The Regents' historical practice in setting the investment earnings assumptions.
- The risk adjustment model indicates a 60% confidence level that the average future return of the UCRP portfolio will be no less than 7.50%. While this is a substantial reduction in confidence level from four years ago, it is consistent with corresponding results from other systems.
- The 7.50% risk adjusted investment return assumption is neither overly conservative nor overly aggressive when measured against the market and inflationary expectations of a sample of investment consultants.

Based on these results, we recommend that the investment return assumption remain at 7.50%.

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 Plan Compensation (HAPC)) and future normal cost collections; and (ii) by increasing total active member payroll over which UAAL payments (or credits if the UAAL is negative) can be amortized. These two impacts are discussed separately below.

As an active member 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, active members 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 employers to maintain the members' standard of living.

As discussed earlier in this report, we are recommending no change to the current 3.50% inflation rate assumption. This inflation component will be used as part of the salary increase assumption.

2. Real “Across the Board” Pay Increases – These increases are typically termed productivity increases since they are considered to be derived from the ability of an organization or economy to produce goods and services in a more efficient manner. As that occurs, some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all active members “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 0.7% to 1.0% 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 August 2010. 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. However, we note that the actual average inflation plus “across the board” increase (i.e., wage inflation) over the four-year experience period was 4.7%. This is nearly 1.5% greater than our proposed price inflation assumption.

Considering these factors, we recommend increasing the real “across the board” salary increase assumption from 0.25% to 0.50%. This means that the combined inflation and “across the board” salary increase assumption increases from 3.75% to 4.00%.

3. Promotional and Merit Increases – As the name implies, these increases come from an active member’s career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For UCRP, this assumption is structured as a function of a member’s service, and it is derived from employer- and member-specific information as part of the experience study. The annual promotional and merit increases are determined by measuring the actual salary increases by active members, net of the inflationary and real “across the board” components. Increases are measured separately for Faculty and Staff/Safety members. This is accomplished by:

- Measuring each continuing member’s actual salary increase over each year of the experience period;
- Excluding any members with increases of more than 50% or decreases of more than 10% during any particular year;
- Categorizing these increases according to member demographics;
- Removing the wage inflation component from these increases (estimated as the increase in the members’ average salary during the year for all members);
- Averaging these annual increases over the four-year experience period; and
- Modifying current assumptions to reflect some portion of these measured increases reflective of their “credibility”.

The following table compares Faculty members' actual average promotional and merit increases by years of service over the four-year experience period from July 1, 2006 through June 30, 2010. The actual increases were reduced by the actual average inflation plus real "across the board" increase (i.e., wage inflation) for each year over the four-year experience period (4.4% on average).

FACULTY

Years of Service	Current Assumptions	July 1, 2006 Through June 30, 2010 Average Faculty Promotional and Merit Increases	Proposed Assumptions
Less than 1	3.25%	0.25%	2.75%
1	3.25	0.59	2.75
2	3.25	2.00	2.75
3	3.25	1.52	2.75
4	3.25	2.06	2.75
5	3.25	1.62	2.70
6	3.20	2.58	2.65
7	3.10	1.82	2.60
8	3.00	2.11	2.50
9	2.90	1.95	2.40
10	2.80	1.78	2.30
11	2.70	1.73	2.20
12	2.60	1.84	2.10
13	2.50	1.67	2.00
14	2.40	1.67	1.90
15	2.30	1.86	1.80
16	2.20	1.18	1.70
17	2.10	1.26	1.60
18	2.00	1.26	1.50
19	1.75	1.56	1.30
20 & over	1.50	0.45	1.10
Average	2.56%	1.36%	2.07%

The following table provides similar information for Staff and Safety members. The actual average promotional and merit increases were determined by reducing the actual average total salary increases by the actual average inflation plus real “across the board” increase (i.e., wage inflation) for each year over the four-year period (4.7% on average).

STAFF AND SAFETY

Years of Service	Current Assumptions	July 1, 2006 Through June 30, 2010 Average Staff and Safety Promotional and Merit Increases	Proposed Assumptions
Less than 1	3.25%	0.65%	2.75%
1	3.00	1.94	2.50
2	2.80	1.83	2.30
3	2.50	1.46	2.10
4	2.20	1.49	1.90
5	2.00	1.26	1.70
6	1.80	1.12	1.50
7	1.70	0.88	1.40
8	1.60	0.70	1.30
9	1.50	0.66	1.20
10	1.40	0.47	1.10
11	1.30	0.28	1.00
12	1.20	0.29	0.90
13	1.10	0.20	0.80
14	1.00	0.14	0.70
15	0.90	0.22	0.60
16	0.80	0.05	0.50
17	0.75	-0.05	0.45
18	0.70	-0.09	0.40
19	0.65	-0.10	0.35
20 & over	0.60	-0.42	0.30
Average	1.86%	0.82%	1.43%

Charts 2 and 3 provide a graphical comparison of the actual promotional and merit increases, compared to the current and proposed assumptions. Chart 2 shows this information for Faculty members and Chart 3 is for Staff and Safety members. The charts also show the actual promotional and merit increases based on an average of both the current and previous four-year experience period. This is discussed below.

We realize that the four-year experience period from July 1, 2006 through June 30, 2010 consisted of some years where salary increases were suppressed and other years where “catchup” pay increases occurred for many members. Therefore, we also examined the prior four-year experience period. We believe that when the two four-year experience periods are combined into an average result it provides a reasonable representation of potential future increases over the long-term. Based on this experience, we are proposing reductions in the promotional and merit salary increases for all members.

As mentioned earlier in this report, the temporary Furlough/Salary Reduction Plan approved by The Regents in July 2009 occurred during the four-year experience study period. The salary data upon which this experience study is based excludes the temporary Furlough/Salary Reduction Plan. This is because of the temporary nature of the Furlough/Salary Reduction Plan and also due to the amendment to UCRP adopted by The Regents to ensure that the Furlough/Salary Reduction Plan has no impact on the calculation of member benefits.

Chart 2
Promotional and Merit Salary Increase Rates - Faculty

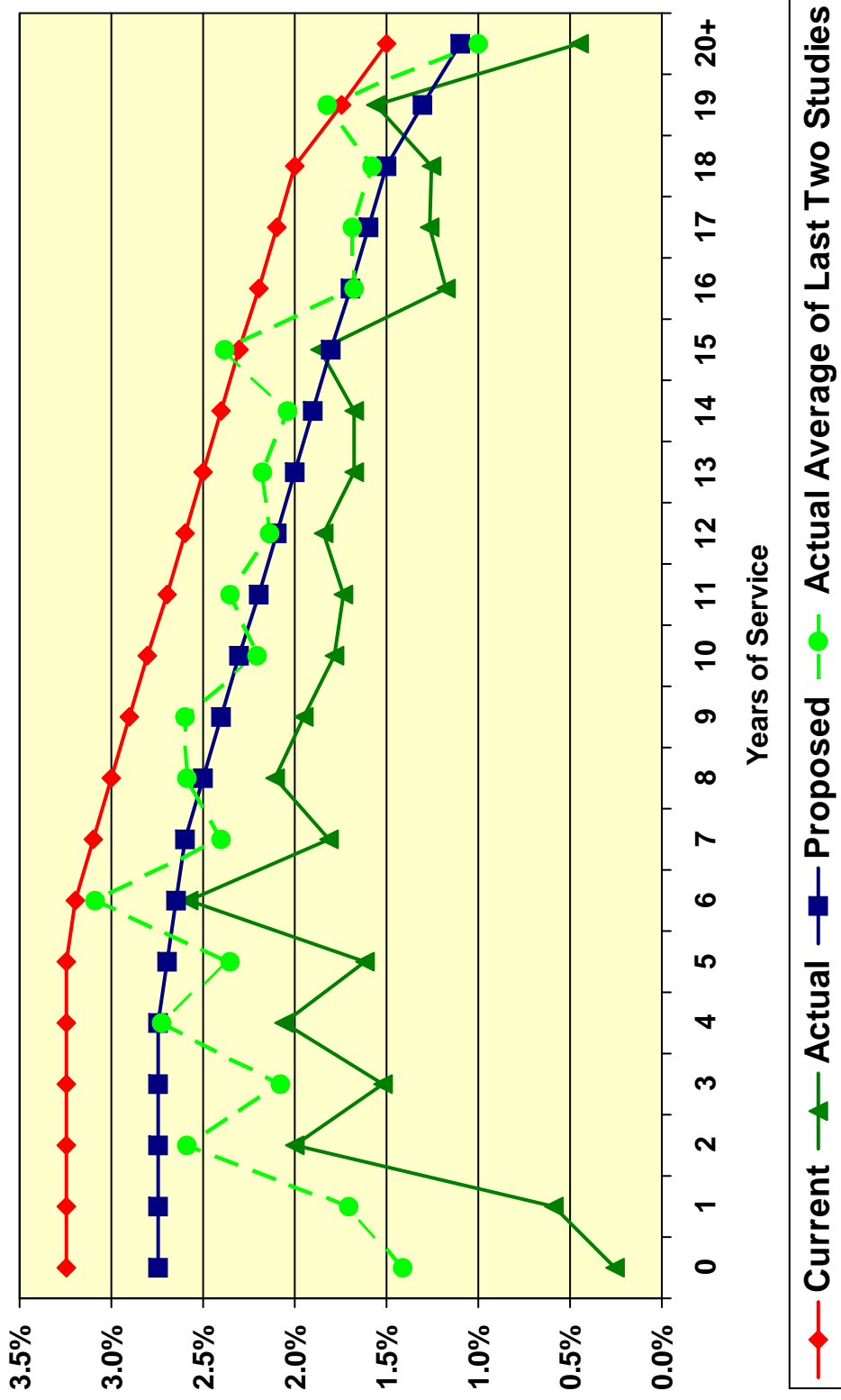
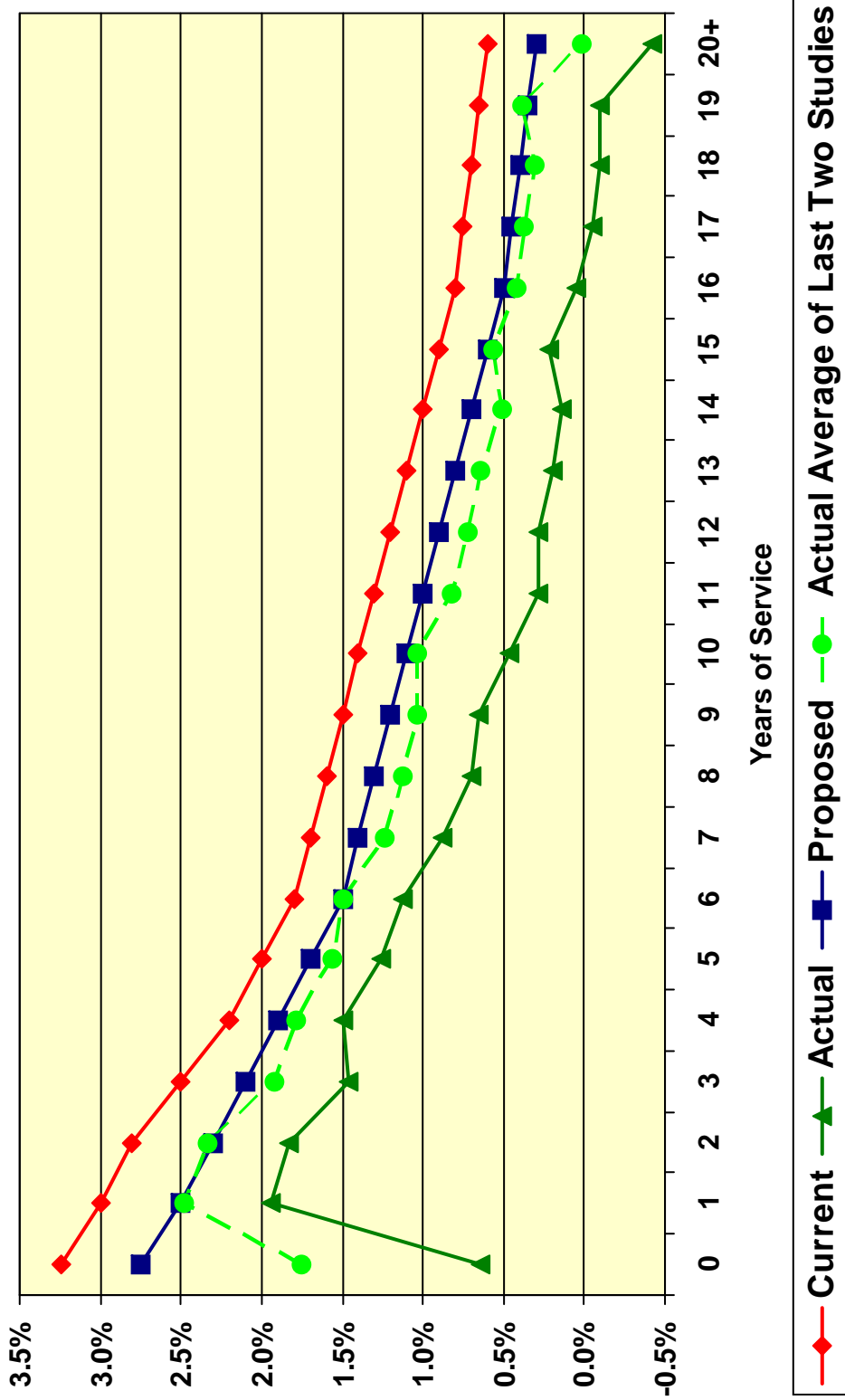


Chart 3
Promotional and Merit Salary Increase Rates -
Staff and Safety



IV. DEMOGRAPHIC ASSUMPTIONS

A. RETIREMENT RATES

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

Currently, the assumed retirement rates are a function of only a member's age. Our experience review analyzed recent years' retirement rates independently for Faculty, Staff, and Safety members, both as a function of age and also as a function of years of service. Our review concluded:

- Age-related retirement rates continue to predict actual experience well for Faculty members,
- Retirement rates for Staff members also correlate well with years of service (at least partially because of the service-based graded eligibilities for retiree health benefits), and
- Experience for Safety members is extremely limited due to the small number of Safety members in the UCRP.

As a result of these observations, we recommend that retirement rates be structured as a function of both age and years of service for Staff members. For Faculty and Safety members, retirement rates will continue to be structured as a function of age only.

The following table shows the observed retirement rates for Faculty members based on the actual experience over the four-year period. Also shown are the current rates assumed and the rates we propose:

FACULTY			
Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
50	2.00%	1.46%	2.00%
51	1.00	0.48	1.00
52	1.00	0.86	1.00
53	1.00	0.79	1.00
54	1.00	0.71	1.00
55	2.00	1.26	2.00
56	2.00	1.05	2.00
57	2.00	1.87	2.00
58	2.00	1.82	2.00
59	3.00	3.54	3.00
60	5.00	5.01	5.00
61	5.00	4.93	5.00
62	5.00	6.10	5.00
63	5.00	5.03	5.00
64	7.00	6.65	7.00
65	8.00	10.23	9.00
66	9.00	11.52	10.00
67	10.00	11.83	11.00
68	12.00	9.60	12.00
69	15.00	15.81	15.00
70	15.00	11.65	15.00
71	12.00	13.02	12.00
72	12.00	13.41	12.00
73	12.00	9.36	12.00
74	12.00	13.92	12.00
75 & Over	100.00	11.46	100.00

For the 65-67 age group, we are proposing increases in the assumed rates for Faculty members. For all other age groups, we recommend maintaining the assumed rates.

Chart 4 compares actual experience with the current and proposed rates of retirement for Faculty members.

The following tables show the observed retirement rates for Staff members (excludes Faculty and Safety members) over the four-year period. Also shown are the current rates assumed and the rates we propose. Separate tables are shown for those with less than ten years of service; those with ten to twenty years of service; and those with twenty or more years of service:

STAFF
Less than Ten Years of Service

Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
50	4.00%	2.26%	2.40%
51	4.00	1.68	1.80
52	4.00	1.87	1.80
53	4.00	2.45	1.80
54	5.00	2.19	2.40
55	5.00	3.42	2.40
56	6.00	2.94	3.00
57	6.00	4.29	3.60
58	8.00	4.36	4.20
59	14.00	5.01	6.00
60	20.00	7.77	8.40
61	20.00	9.27	9.60
62	20.00	10.85	10.80
63	20.00	11.54	10.80
64	25.00	13.65	12.00
65	30.00	23.38	25.00
66	25.00	22.15	22.00
67	25.00	18.53	22.00
68	25.00	18.18	22.00
69	25.00	19.33	22.00
70	20.00	19.77	20.00
71	20.00	20.69	20.00
72	20.00	25.93	20.00
73	20.00	18.37	20.00
74	20.00	18.75	20.00
75 & Over	100.00	33.33	100.00

STAFF
Ten to Twenty Years of Service

Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
50	4.00%	4.08%	4.00%
51	4.00	2.85	3.00
52	4.00	2.07	3.00
53	4.00	2.35	3.00
54	5.00	3.45	4.00
55	5.00	3.87	4.00
56	6.00	4.44	5.00
57	6.00	4.70	6.00
58	8.00	5.12	7.00
59	14.00	8.55	10.00
60	20.00	10.18	14.00
61	20.00	13.49	16.00
62	20.00	16.55	18.00
63	20.00	14.49	18.00
64	25.00	16.20	20.00
65	30.00	25.70	25.00
66	25.00	21.39	22.00
67	25.00	23.31	22.00
68	25.00	18.40	22.00
69	25.00	23.35	22.00
70	20.00	25.20	20.00
71	20.00	14.58	20.00
72	20.00	24.29	20.00
73	20.00	18.75	20.00
74	20.00	27.27	20.00
75 & Over	100.00	22.73	100.00

STAFF
Twenty or More Years of Service

Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
50	4.00%	4.62%	6.00%
51	4.00	1.91	4.50
52	4.00	2.59	4.50
53	4.00	2.90	4.50
54	5.00	4.13	6.00
55	5.00	5.55	6.00
56	6.00	5.25	7.50
57	6.00	6.85	9.00
58	8.00	9.07	10.50
59	14.00	25.11	15.00
60	20.00	24.44	21.00
61	20.00	21.84	24.00
62	20.00	23.08	27.00
63	20.00	21.69	27.00
64	25.00	21.52	30.00
65	30.00	26.60	25.00
66	25.00	21.37	22.00
67	25.00	26.50	22.00
68	25.00	17.34	22.00
69	25.00	21.64	22.00
70	20.00	23.66	20.00
71	20.00	14.00	20.00
72	20.00	20.41	20.00
73	20.00	21.88	20.00
74	20.00	30.43	20.00
75 & Over	100.00	25.00	100.00

Note that we first developed a base set of proposed retirement rates for Staff members with ten to twenty years of service. Then for ages less than 65, the proposed retirement rates for Staff members with less than ten years of service are 60% of the base rates. Similarly, for ages less than 65, the proposed retirement rates for Staff members with twenty or more years of service are 150% of the base rates.

We are generally recommending decreases in the assumed retirement rates for Staff members with less than twenty years of service, and increases in the assumed retirement rates for Staff members with twenty or more years of service.

Charts 5 through 7 compare actual experience with the current and proposed rates of retirement for Staff members, corresponding to the preceding tables.

The following table shows the observed retirement rates for Safety members over the four-year period. Also shown are the current rates assumed and the rates we propose:

SAFETY			
Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
50	15.00%	26.19%	20.00%
51	10.00	14.81	10.00
52	10.00	5.26	10.00
53	10.00	14.81	10.00
54	10.00	4.00	10.00
55	25.00	9.09	20.00
56	25.00	14.29	20.00
57	25.00	30.77	25.00
58	25.00	50.00	25.00
59	25.00	25.00	25.00
60	25.00	0.00	25.00
61	25.00	50.00	30.00
62	50.00	0.00	40.00
63	50.00	0.00	50.00
64	75.00	0.00	60.00
65 & over	100.00	11.11	100.00

We are recommending various changes in the retirement rates for Safety members. Overall, these changes are increases in the assumed rates.

Chart 8 compares actual experience with the current and proposed rates of retirement for Safety members.

Please note that in determining the actual rates of retirement over the four-year period we included any retirements that occurred on July 1, 2010 as most of those retirements are reported to us in the July 1, 2010 data used in the actuarial valuation. Conversely, most retirements that occurred on July 1, 2006

were reported in the July 1, 2006 valuation data and are not included in the actual experience used in this study (i.e., they were included in the prior study).

In prior valuations, deferred vested members were assumed to retire at age 59. The average age at retirement over the prior four years was 59. We recommend maintaining the assumed retirement age of 59 for all deferred vested members.

We did review the average age at retirement for deferred vested members separately for Faculty and Staff over the last four years. There were minor differences in the average age at retirement and they did not appear to be sufficient to warrant using different assumptions at this time.

Currently there is no assumption made as to whether inactive members will go on to work for a reciprocal system. As a result, their liabilities do not include any adjustment for salary increases or service credits for eligibility purposes earned at the reciprocal system. However, we do assume that all deferred vested members in UCRP receive the inactive COLA (generally 2% each year) from termination date until retirement date. This reduces the impact on actuarial liabilities of assuming no salary increases for those deferred vested members who work for a reciprocal system.

We will continue to assume that no inactive members go on to work for a reciprocal system. As necessary, we will also work with University of California Office of the President (UCOP) staff on obtaining data to denote which inactive members went on to work for a reciprocal system, and include this data in future experience studies.

Chart 4
Retirement Rates - Faculty

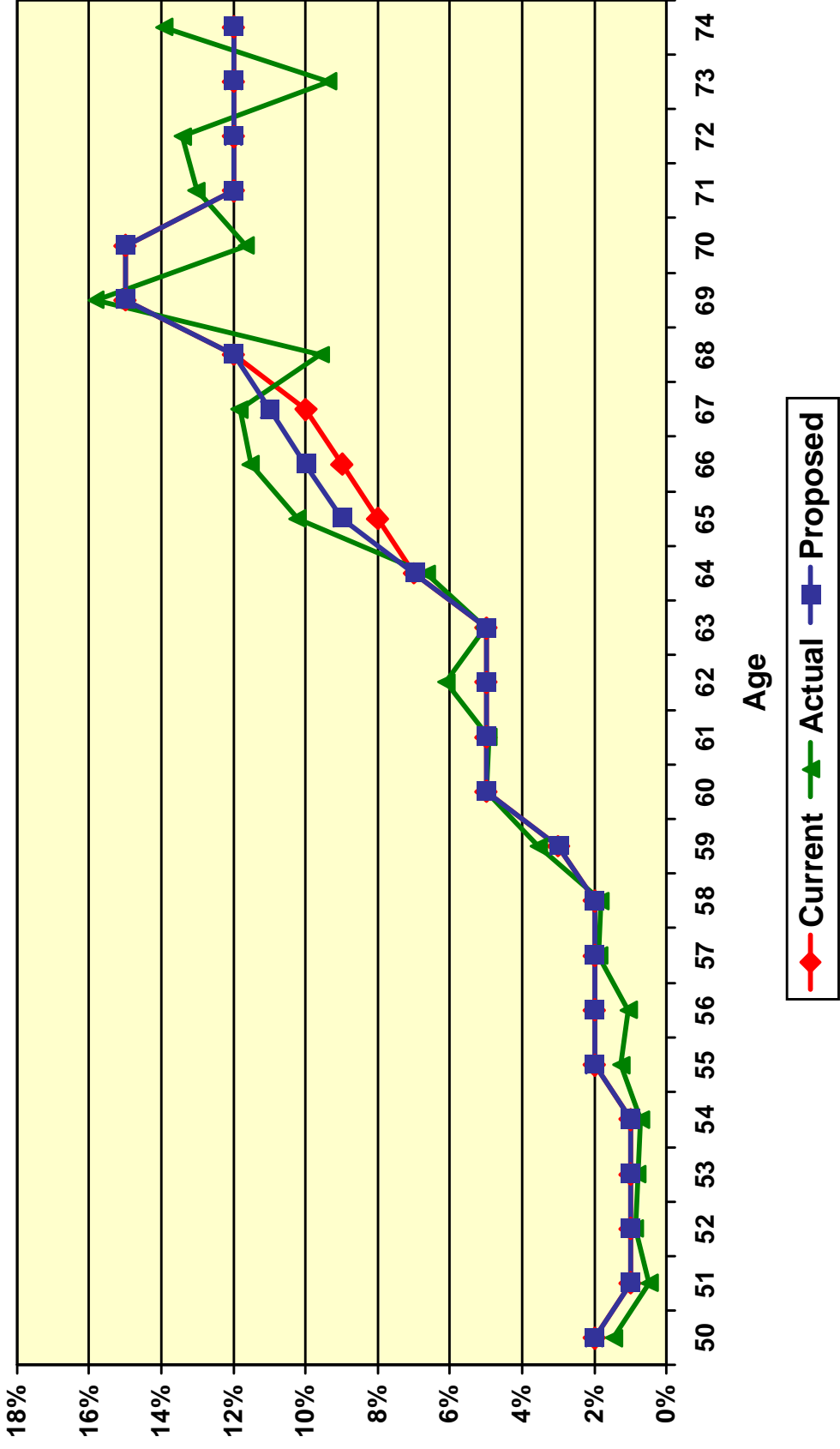


Chart 5
Retirement Rates - Staff
Less than Ten Years of Service

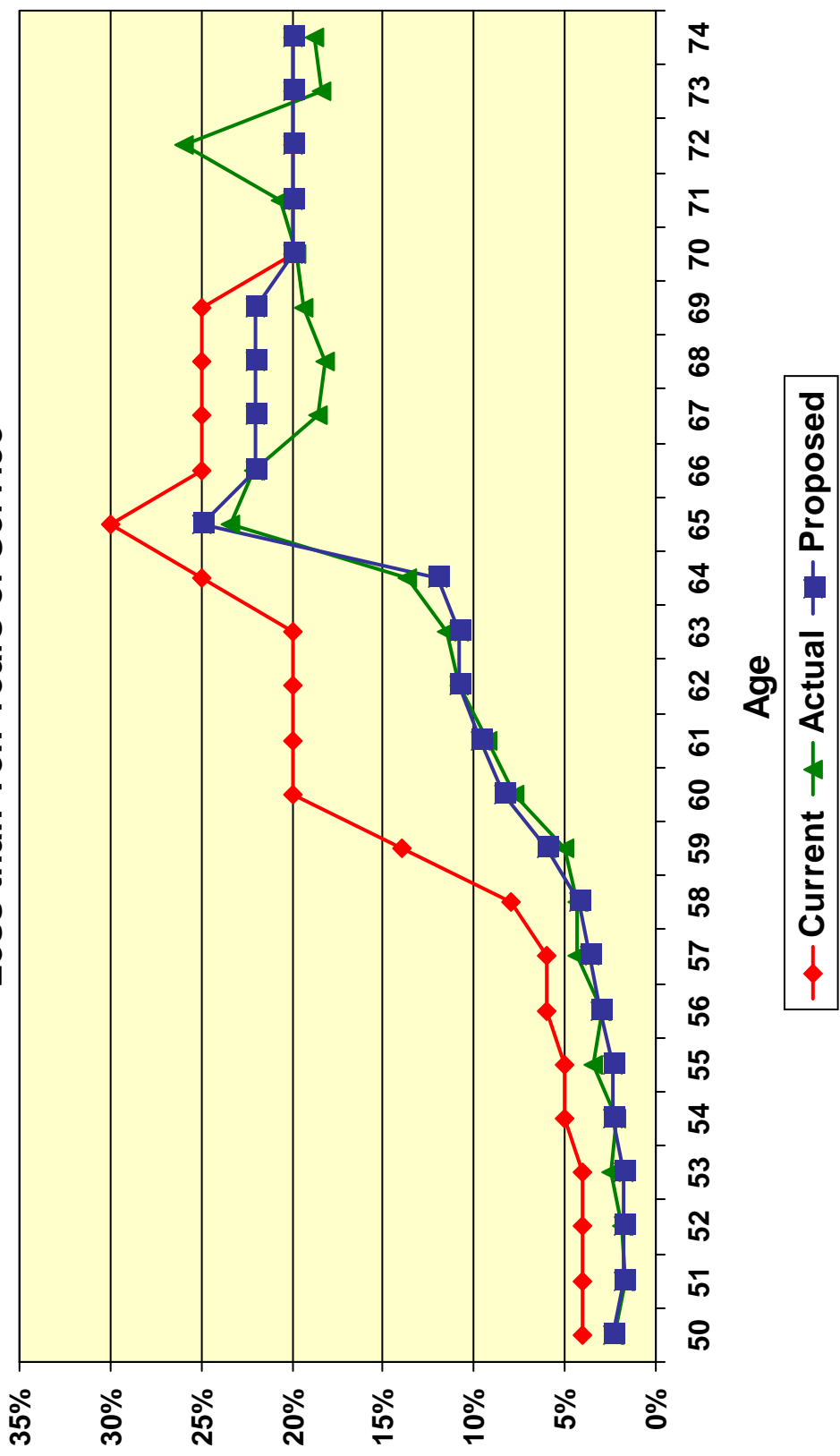


Chart 6
Retirement Rates - Staff
Ten to Twenty Years of Service

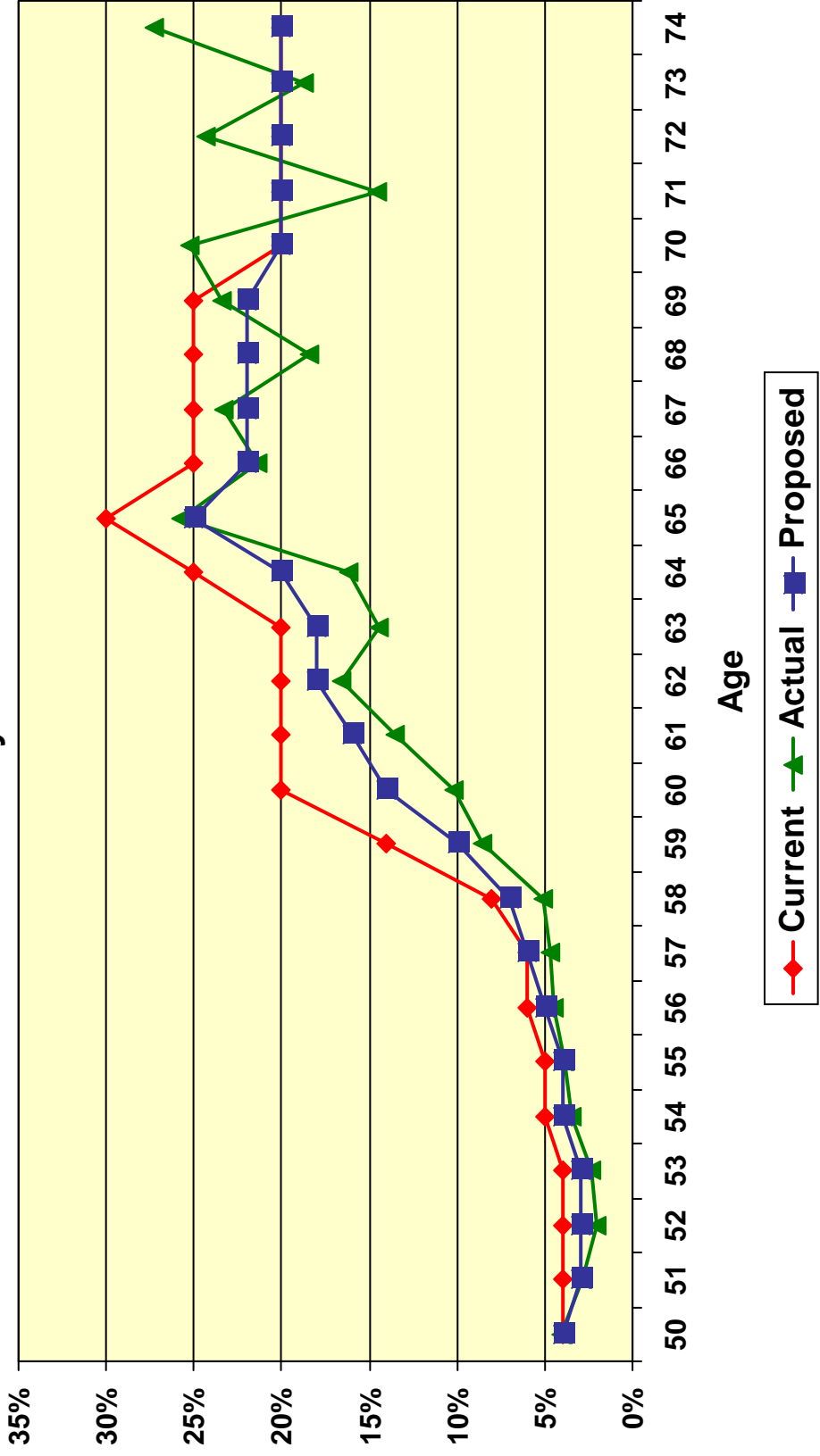


Chart 7
Retirement Rates - Staff
Twenty or More Years of Service

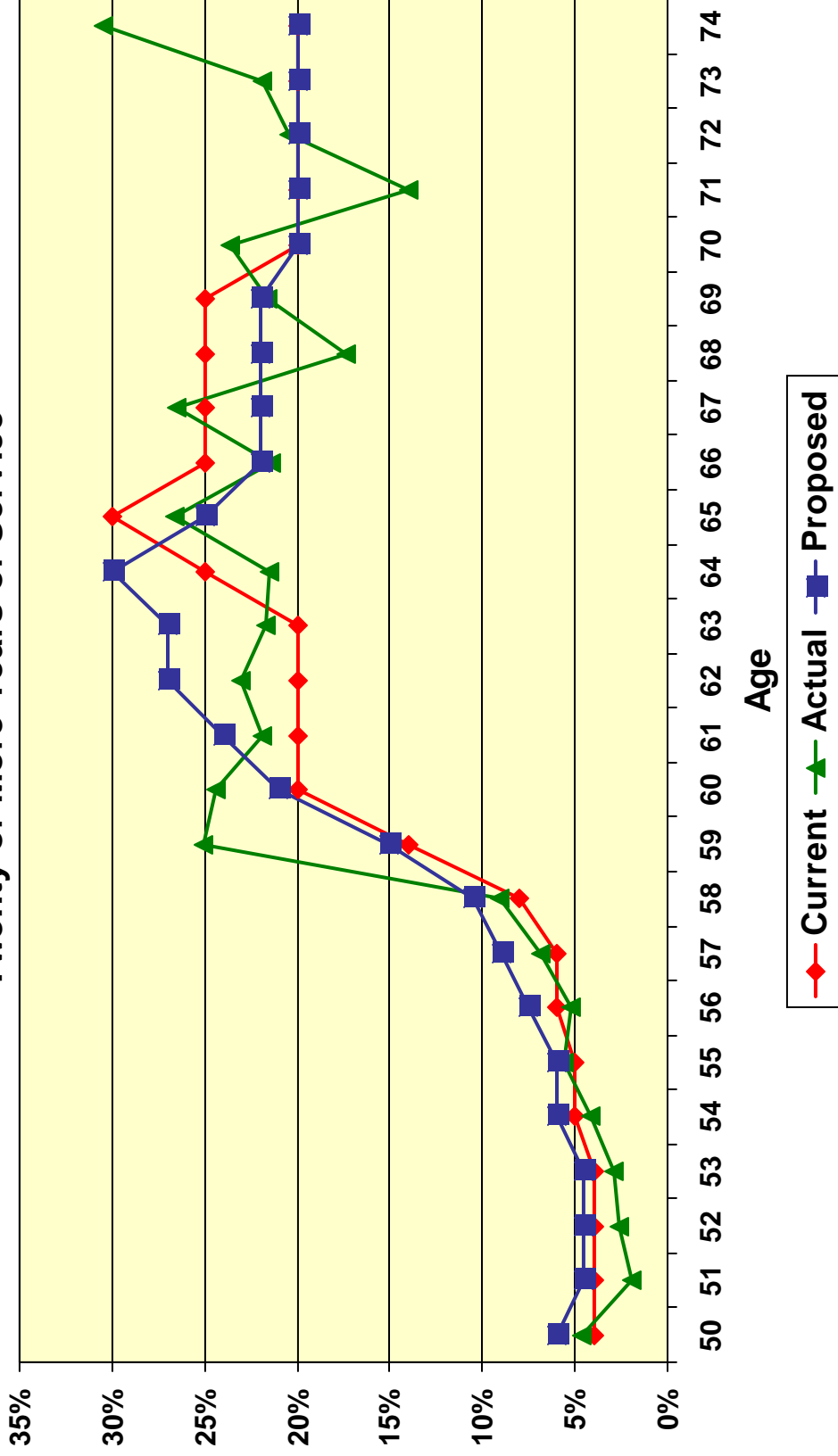
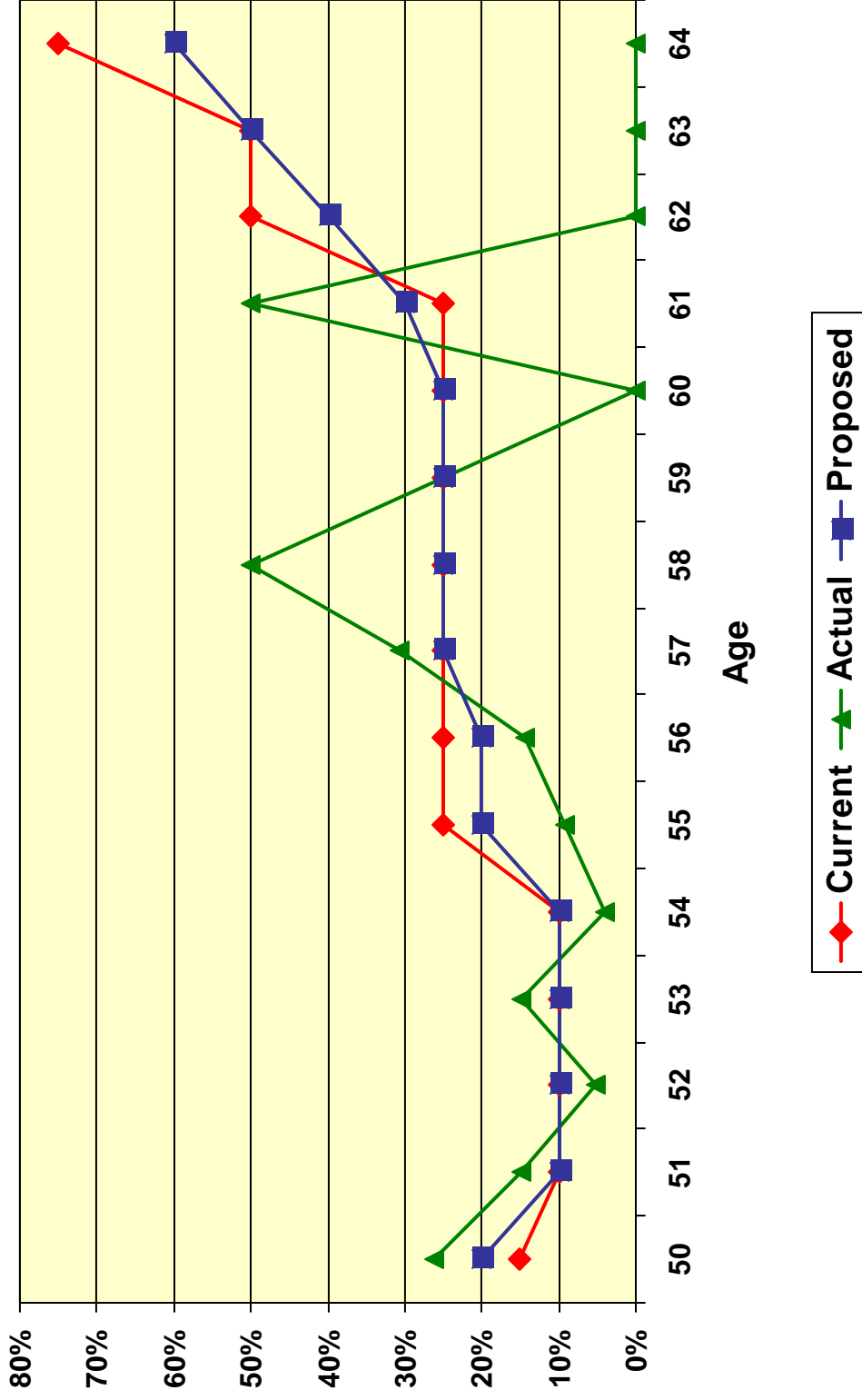


Chart 8
Retirement Rates - Safety



B. MORTALITY RATES – NON-DISABLED (HEALTHY)

The non-disabled or “healthy” mortality rates project what proportion of members will die before retirement as well as the life expectancy of members who are not receiving Disability Income. The table currently being used for healthy post-retirement mortality rates is the 1994 Group Annuity Reserving Mortality Table, projected with scale AA to 2002. Ages are set back two years for males (from the male table) and set back one year for females (from the female table).

Post-Retirement Mortality

Among retired members, the actual deaths compared to the expected deaths under the current and proposed assumptions for the last four years are as follows:

Year Ending June 30,	Healthy Pensioners - Male			Healthy Pensioners - Female		
	Expected Deaths	Actual Deaths	Proposed Expected Deaths	Expected Deaths	Actual Deaths	Proposed Expected Deaths
2007	494	468	388	350	365	308
2008	524	440	413	376	371	331
2009	559	480	443	404	370	356
2010	<u>589</u>	<u>492</u>	<u>468</u>	<u>434</u>	<u>396</u>	<u>382</u>
Total	2,166	1,880	1,712	1,564	1,502	1,377
Actual / Expected	87%		110%	96%		109%

Chart 9 summarizes the above information. Experience shows that there were significantly fewer deaths than predicted by the current tables. Therefore, we recommend changing the mortality table for healthy pensioners to the RP-2000 Combined Healthy Mortality Tables (separate tables for males and females) projected with scale AA to 2025, with ages set back two years.

This recommendation will bring the combined (male and female) actual to expected ratio very close to 110%. This is consistent with standard actuarial practice to include some margin in the rates to anticipate expected future improvements in life expectancy. Generally, preferable practice is to have a margin of at least 10%; that is, the actual deaths among current members are around 10% greater than the expected deaths during the study period.

Chart 10 shows the life expectancies (i.e. expected future lifetime) under the current and proposed tables.

Pre-Retirement Mortality

The number of deaths among active and inactive vested members is not large enough to provide a statistically credible basis for a specific pre-retirement mortality analysis. Therefore, we propose that pre-retirement mortality follow the same tables used for post-retirement mortality.

Mortality Tables for Annuity Option Factors and Lump Sum Cashout Factors

Currently, the mortality table used for determining annuity option factors and Lump Sum Cashout factors is the 1994 Group Annuity Reserving Mortality Table for males, unloaded, projected with scale AA to 2002 set back three years for members and five years for Eligible Survivors and Contingent Annuitants. Based on the proposed valuation mortality tables and the actual sex distribution of active UCRP members, we propose using the RP-2000 Combined Healthy Mortality Tables projected with scale AA to 2025 set back two years weighted 40% male and 60% female for members. For Eligible Survivors and Contingent Annuitants, we propose applying a weighting of 60% male and 40% female.

In general, these changes will result in increases to the annuity option factors and Lump Sum Cashout factors. If the proposed assumptions are adopted by The Regents then we will work with UCOP to implement the new annuity option factors. We would propose that a July 1, 2012 effective date be used for the changes to the annuity option factors and Lump Sum Cashout factors. This would be consistent with the one-year delay in applying the valuation assumption changes recommended herein to the total funding policy contribution. Such contribution will be determined in the July 1, 2011 actuarial valuation but not effective until July 1, 2012. It is our experience that implementing changes to annuity option factors and Lump Sum Cashout factors consistent with the date that the total funding policy rates would be implemented is by far the most prevalent practice among public sector retirement systems in California.

Chart 9
Post-Retirement Deaths
Healthy/Non-disabled Pensioners

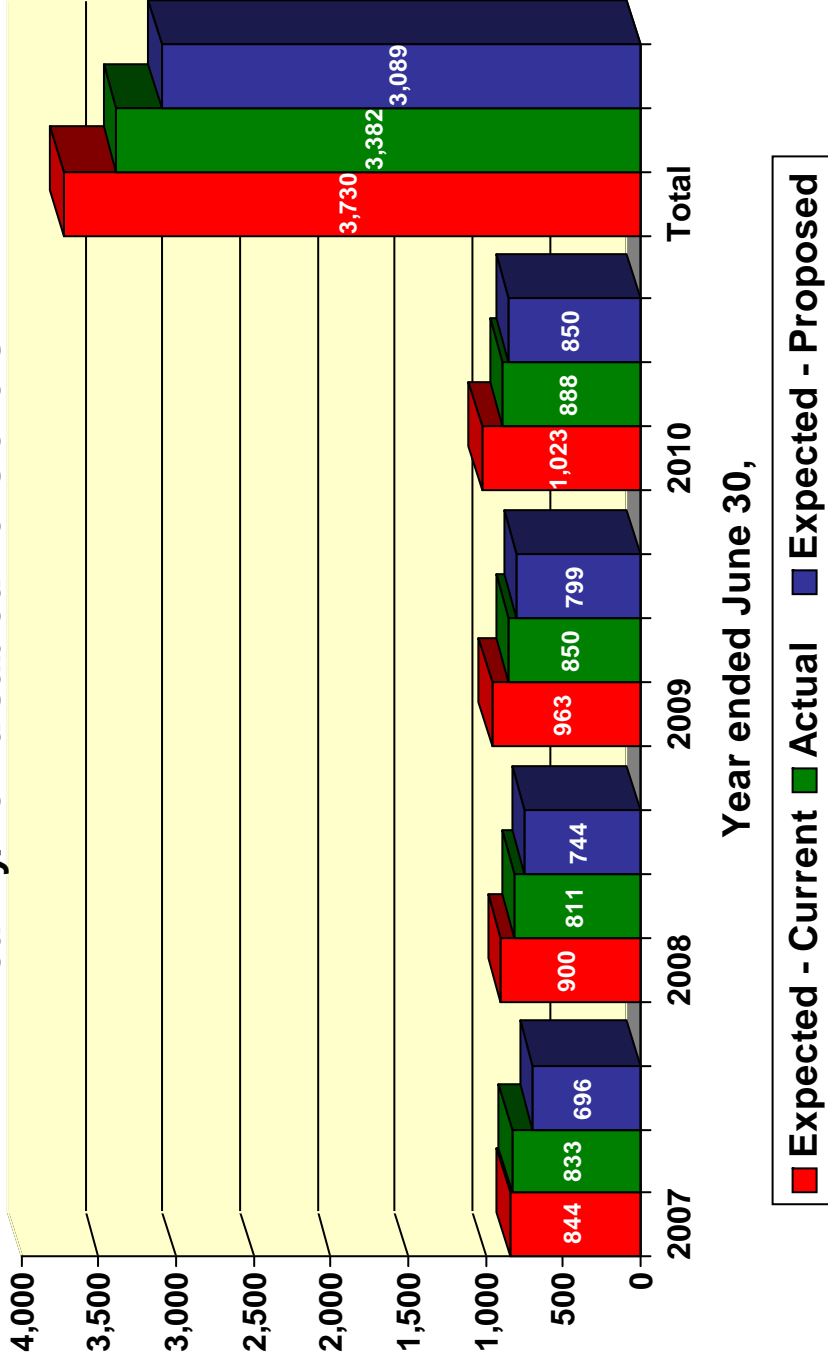
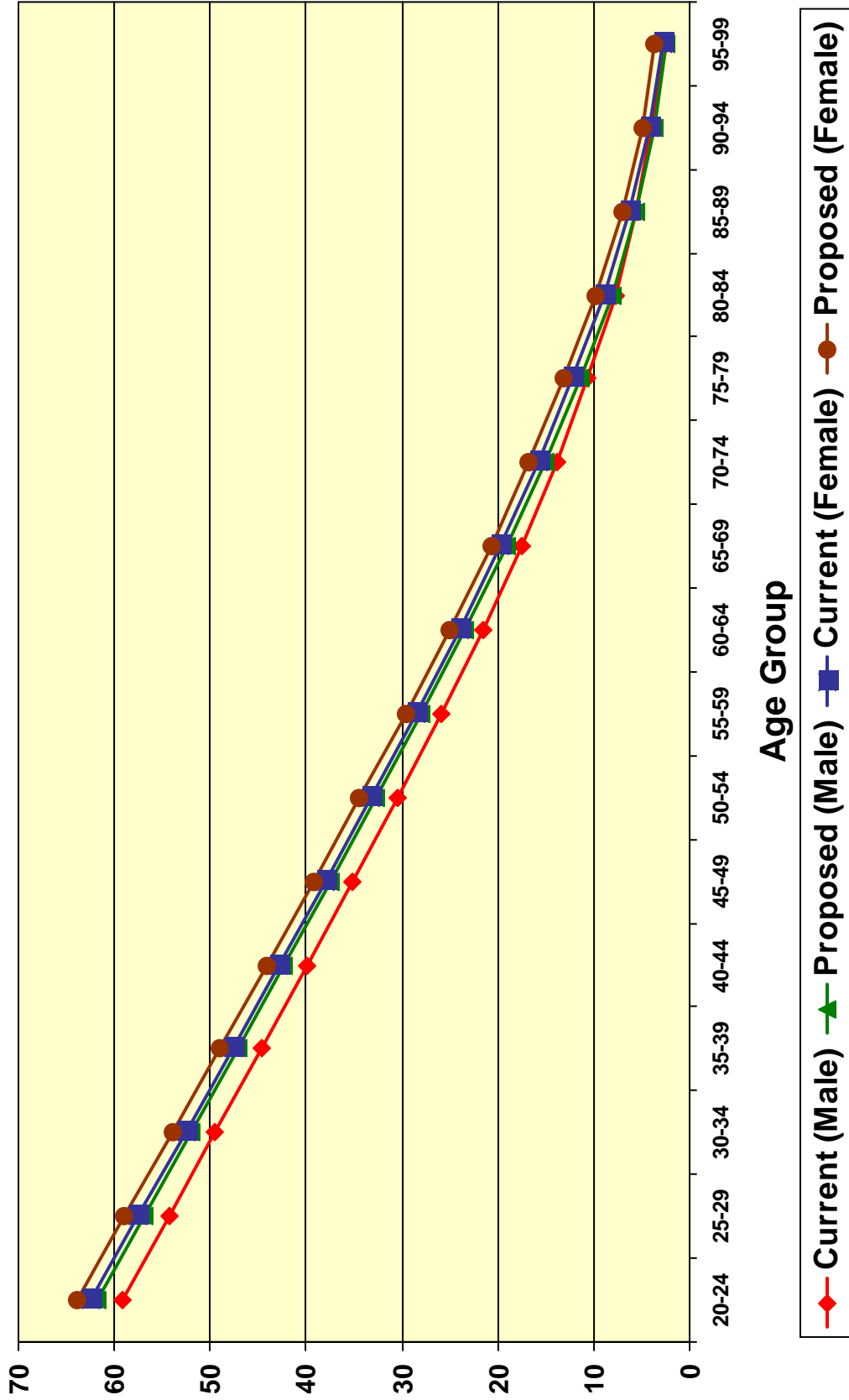


Chart 10
Life Expectancies (Healthy Pensioners)



C. MORTALITY RATES - DISABLED

Since mortality rates for members receiving Disability Income can be higher than for non-disabled or “healthy” members, a different mortality assumption is often used. The table currently being used is the RP-2000 Disabled Retiree Mortality Table, with a set back of two years for males (from the male table) and one year for females (from the female table).

Disabled Mortality

Among members receiving Disability Income, the actual deaths compared to the expected deaths under the current and proposed assumptions for the last four years are as follows:

Year Ending June 30,	<u>Disabled Pensioners - Male</u>			<u>Disabled Pensioners - Female</u>		
	Expected Deaths	Actual Deaths	Proposed Expected Deaths	Expected Deaths	Actual Deaths	Proposed Expected Deaths
2007	31	28	21	23	25	20
2008	30	18	20	23	27	21
2009	30	20	20	23	26	20
2010	<u>29</u>	<u>21</u>	<u>19</u>	<u>23</u>	<u>19</u>	<u>20</u>
Total	120	87	80	92	97	81
Actual / Expected	73%		109%	105%		120%

Experience shows that there were fewer deaths than predicted by the current tables.

We are recommending a change in the disabled mortality table to the RP-2000 Disabled Retiree Mortality Table projected with scale AA to 2025, with a set back of two years for males and no set back for females. This recommendation will bring the combined (male and female) actual to expected ratio to 114%. This is consistent with the proposed assumption for “healthy” pensioners, where we noted that it is preferable to have at least a 10% margin to allow for future mortality improvement.

Chart 11 compares actual to expected deaths under both the current and proposed assumptions for members receiving Disability Income over the last four years.

Chart 12 shows the life expectancies (i.e. expected future lifetime) under both the current and proposed tables.

We also continue to recommend that the disabled mortality rates apply only while the Disability Income benefit is being received. In operation, disability benefits are paid until age 65 in most cases, at which time the member “crosses over” and receives a service retirement. In effect, the member’s total benefit is a combination of an immediate but temporary disability benefit, followed by a deferred retirement benefit.

For valuing these members’ deferred retirement benefits, we will continue to use the healthy mortality rates. This is done in order to prevent actuarial losses from occurring when members “cross over” from receiving a Disability Income benefit to receiving a retirement benefit since from that point they are currently included with healthy retirees for valuation purposes. If a data flag becomes available in the future on who “crosses over” to retirement then we may be able to isolate those retirees and value them with disabled mortality, if appropriate.

Chart 11
Post-Retirement Deaths
Members Receiving Disability Income

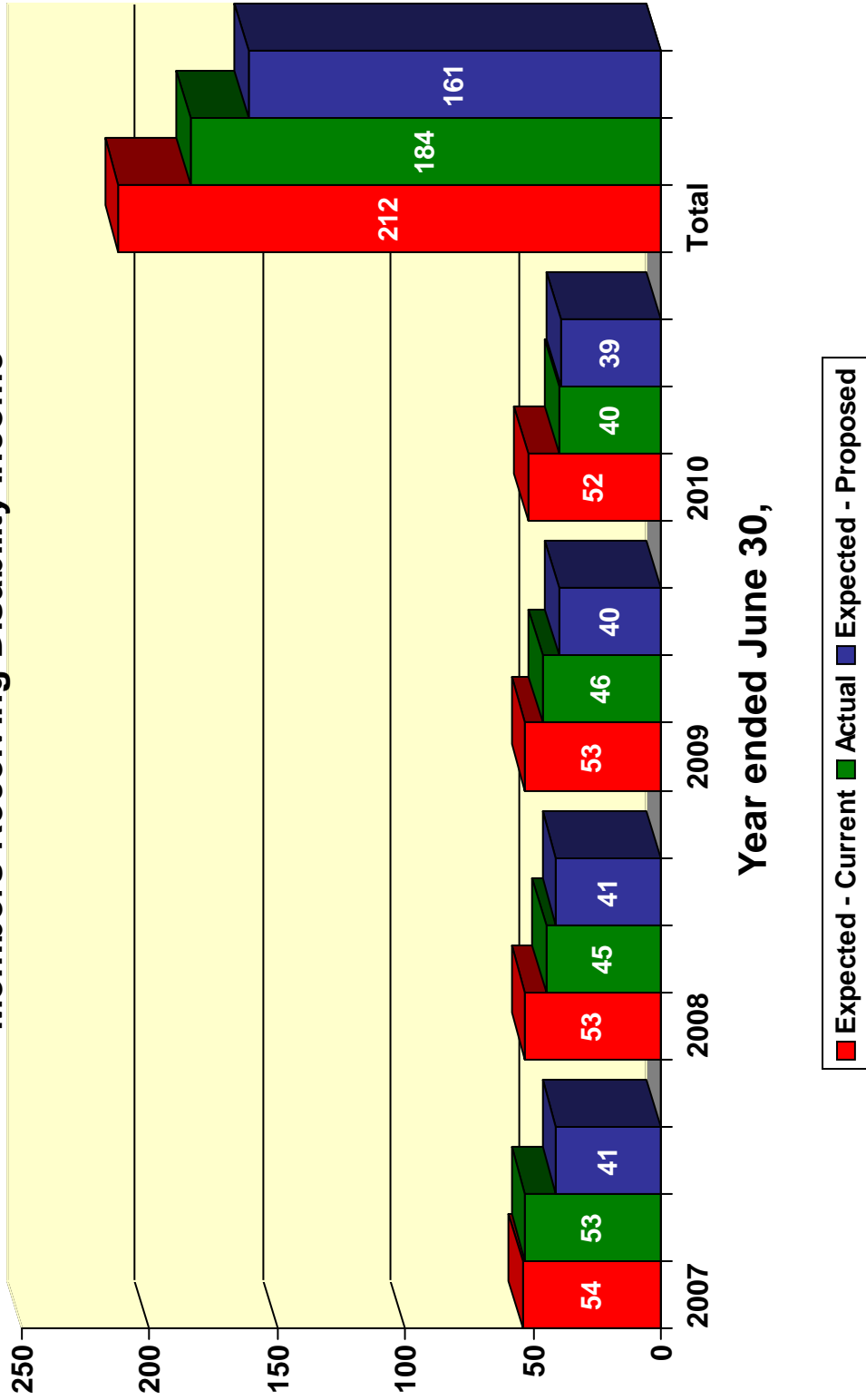
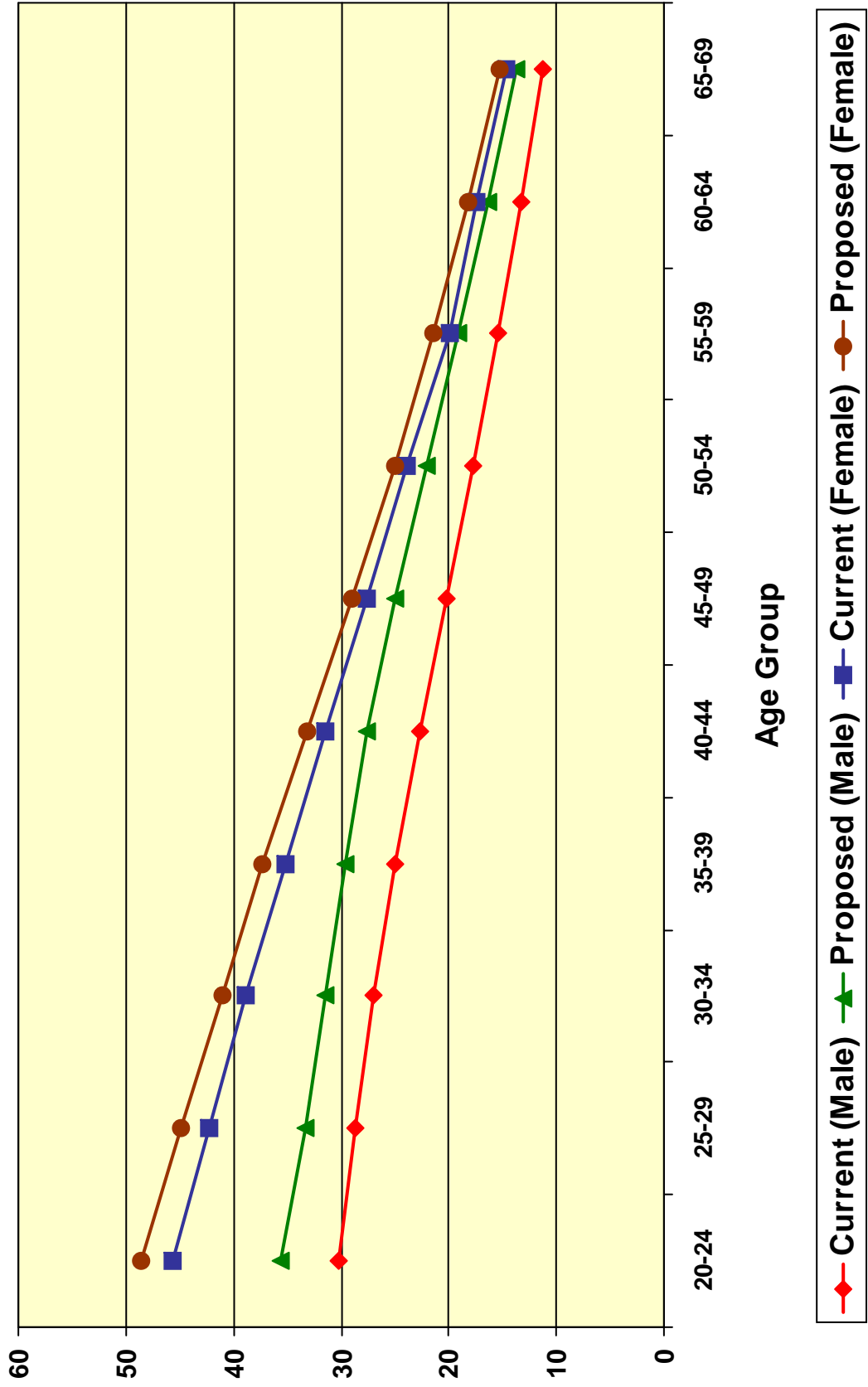


Chart 12
Life Expectancies (Members Receiving Disability Income)



D. TERMINATION RATES

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current assumptions, for members who terminate with over five years of service, the member is assumed to choose a deferred vested benefit. This was based on the fact that there was a period of about twenty years during which there were no member contributions being made to UCRP. Members who terminate with less than five years of service are only entitled to a refund of their member contributions.

Currently, there are separate termination assumptions for Faculty and Staff/Safety members and they are a function of both a member's age and service. Separate tables apply for each year of service category for those with less than five years of service. After that, there is a table that also varies by age that applies to all members with five or more years of service.

Our experience review analyzed termination rates during the most recent four-year period, both as a function of age and years of service. Our review found the following:

- There are distinct differences between Faculty and Staff termination rates. Compared to Faculty termination rates, Staff termination rates are higher.
- While termination rates correlate with both years of service and age, we believe that there is a stronger correlation with years of service. This is also consistent with our experience from other systems.
- Some terminations do occur for members that are eligible to retire, but most of those are limited to members with at least five, but less than ten years of service. Therefore, we have excluded from our review any termination experience attributable to members eligible to retire. This is discussed in more detail later in this section.
- Since the number of Safety members is small and the data is not credible enough to develop termination rates for Safety members only, we have included them in with the Staff members' experience and assumption setting process.

As a result of these observations, we recommend that the termination rate assumptions be:

1. Established separately for Faculty and Staff/Safety members (as they currently are);

2. Structured as a function of years of service only, instead of select and ultimate rates that are a function of both age and years of service.

The termination experience for Faculty members over the last four years by years of service is shown in the table below. We also show the current and proposed assumptions.

FACULTY

Years of Service	Current Assumptions*	Actual Rate	Proposed Assumptions
Less than 1	16.78%	21.94%	19.00%
1	9.79	14.28	12.00
2	7.67	9.02	8.00
3	6.02	7.24	7.00
4	5.01	5.16	6.00
5	4.36	6.20	5.75
6	4.16	6.14	5.50
7	3.98	6.33	5.25
8	3.83	6.86	5.00
9	3.73	6.40	4.75
10	3.60	4.64	4.50
11	3.49	4.36	4.25
12	3.40	3.84	4.00
13	3.32	3.90	3.75
14	3.22	5.16	3.50
15	3.12	4.13	3.25
16	3.07	2.86	3.00
17	3.01	4.80	2.75
18	3.03	2.51	2.50
19	2.96	4.47	2.25
20 & over	2.76	14.08	2.00

* The rate shown is an average rate developed from the current age and service-based assumptions for members in that service category.

It is important to note that not every service category has enough exposures and/or decrements such that the results in that category are statistically credible. This is mainly the case for those members with twenty or more years of service since most members with that much service are eligible to retire and were excluded from the experience (as discussed earlier).

Chart 13 compares actual to expected terminations of the past four years under both the current and proposed assumptions for Faculty members.

Chart 14 shows the actual, current and proposed termination rates for Faculty members by years of service.

The actual termination experience over the four-year period was higher than what was assumed. We propose increasing the termination rates for Faculty members to reflect a weighting between the rates currently assumed and the actual experience that occurred during the recent four-year period.

The termination experience for Staff and Safety members over the last four years by years of service is shown in the table below. We also show the current and proposed assumptions.

STAFF AND SAFETY

Years of Service	Current Assumptions*	Actual Rate	Proposed Assumptions
Less than 1	21.48%	21.03%	21.00%
1	16.71	17.97	17.00
2	12.90	14.60	14.00
3	9.30	11.40	11.00
4	7.79	9.38	9.00
5	6.68	10.95	8.00
6	6.32	9.73	7.50
7	6.04	8.45	7.00
8	5.80	7.78	6.50
9	5.59	7.30	6.00
10	5.35	5.80	5.50
11	5.15	5.22	5.25
12	4.91	4.70	5.00
13	4.72	4.34	4.75
14	4.51	4.27	4.50
15	4.32	3.75	4.25
16	4.15	3.34	4.00
17	3.97	3.61	3.75
18	3.85	2.13	3.50
19	3.74	2.83	3.25
20 & over	3.33	2.89	3.00

* The rate shown is an average rate developed from the current age and service-based assumptions for members in that service category.

Chart 15 compares actual to expected terminations of the past four years under both the current and proposed assumptions for Staff and Safety members.

Chart 16 shows the actual, current and proposed termination rates for Staff and Safety members by years of service.

Similar to Faculty members, the actual termination experience over the four-year period for Staff and Safety members was higher than what was assumed. We also propose increasing the termination rates for Staff and Safety members to reflect a weighting between the currently assumed rates and the actual experience that occurred during the recent four-year period.

Currently termination rates continue to be applied even for members eligible to retire, that is, it is assumed that some members eligible to retire at termination will defer their benefit rather than retire immediately. As briefly mentioned earlier, the actual termination experience over the four-year period shows that there are some terminations occurring for members eligible to retire. However, they are mostly for members with at least five, but less than ten years of service (i.e. members that have a relatively small pension liability and that are also not eligible for retiree health benefits). Therefore, we propose applying no termination rates for members eligible to retire, that is, we will assume that members eligible to retire at termination will retire in accordance with the retirement rate assumptions rather than terminate and defer their benefit.

As noted earlier, for members who terminate with over five years of service, we currently assume that those members will choose a deferred vested benefit. This assumption was mainly based on the period of around two decades over which there were no member contributions being made to UCRP. However, because member contributions have resumed for current UCRP active members and more importantly, since member contributions will be part of the new pension tier for those members hired on or after July 1, 2013, we are proposing a change to this assumption. We recommend an assumption that for members who terminate in the future with five or more years of service, a member will choose between a refund of member contributions and a deferred vested benefit based on which option is more valuable, as measured by its present value at the date of the member's termination.

Chart 13
Actual Number of Terminations Compared to Expected - Faculty

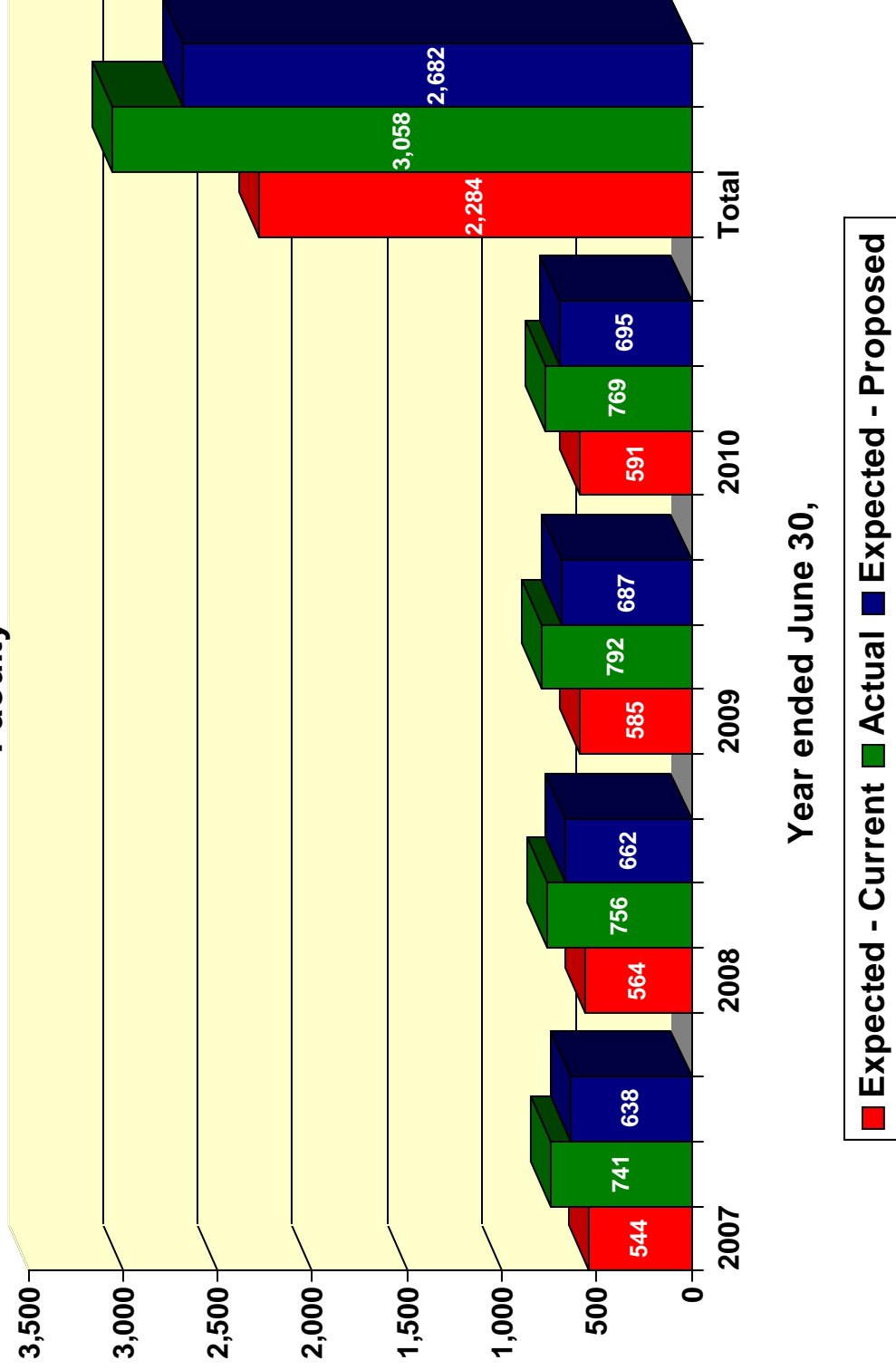


Chart 14
Termination Rates - Faculty

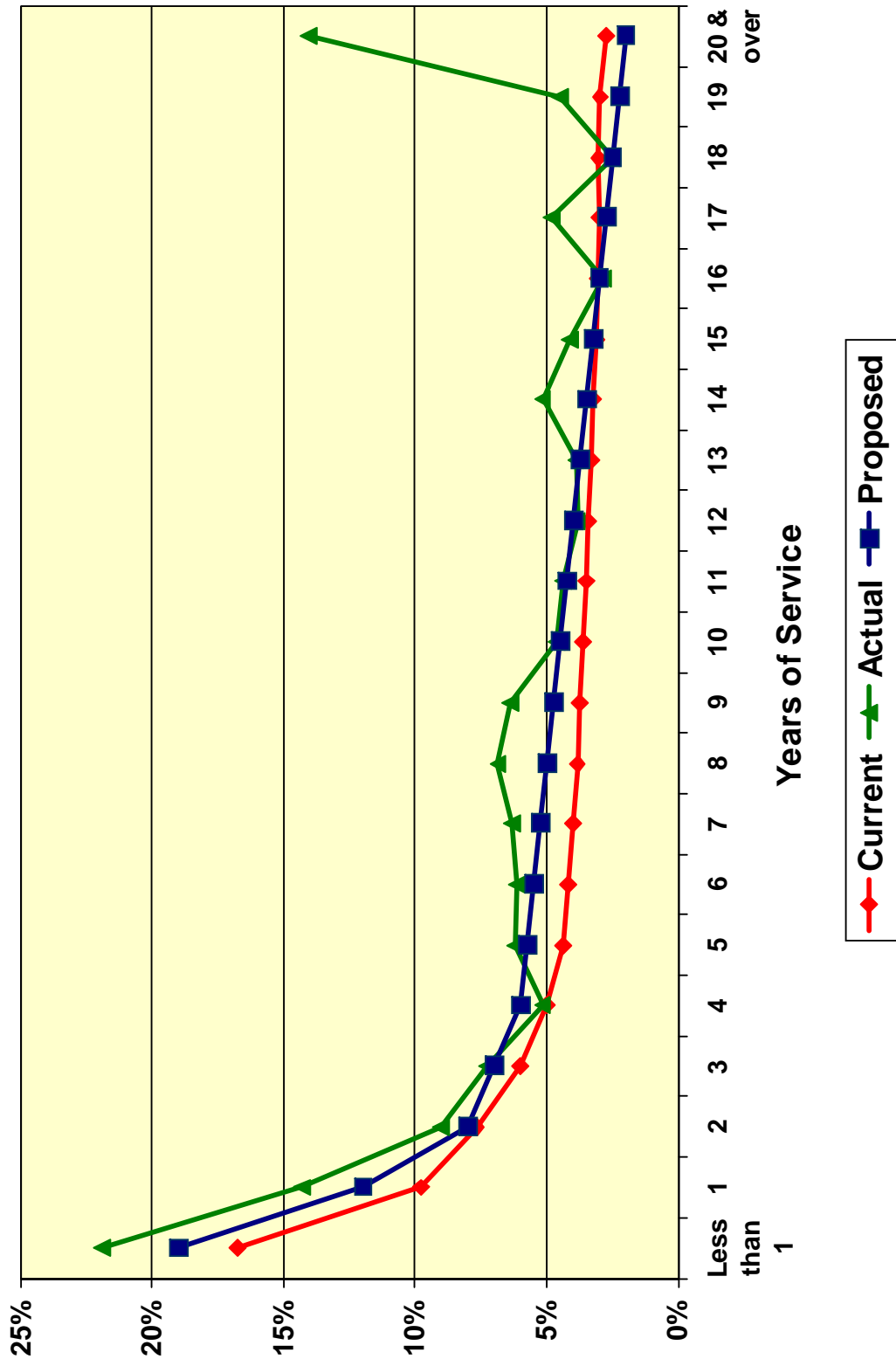
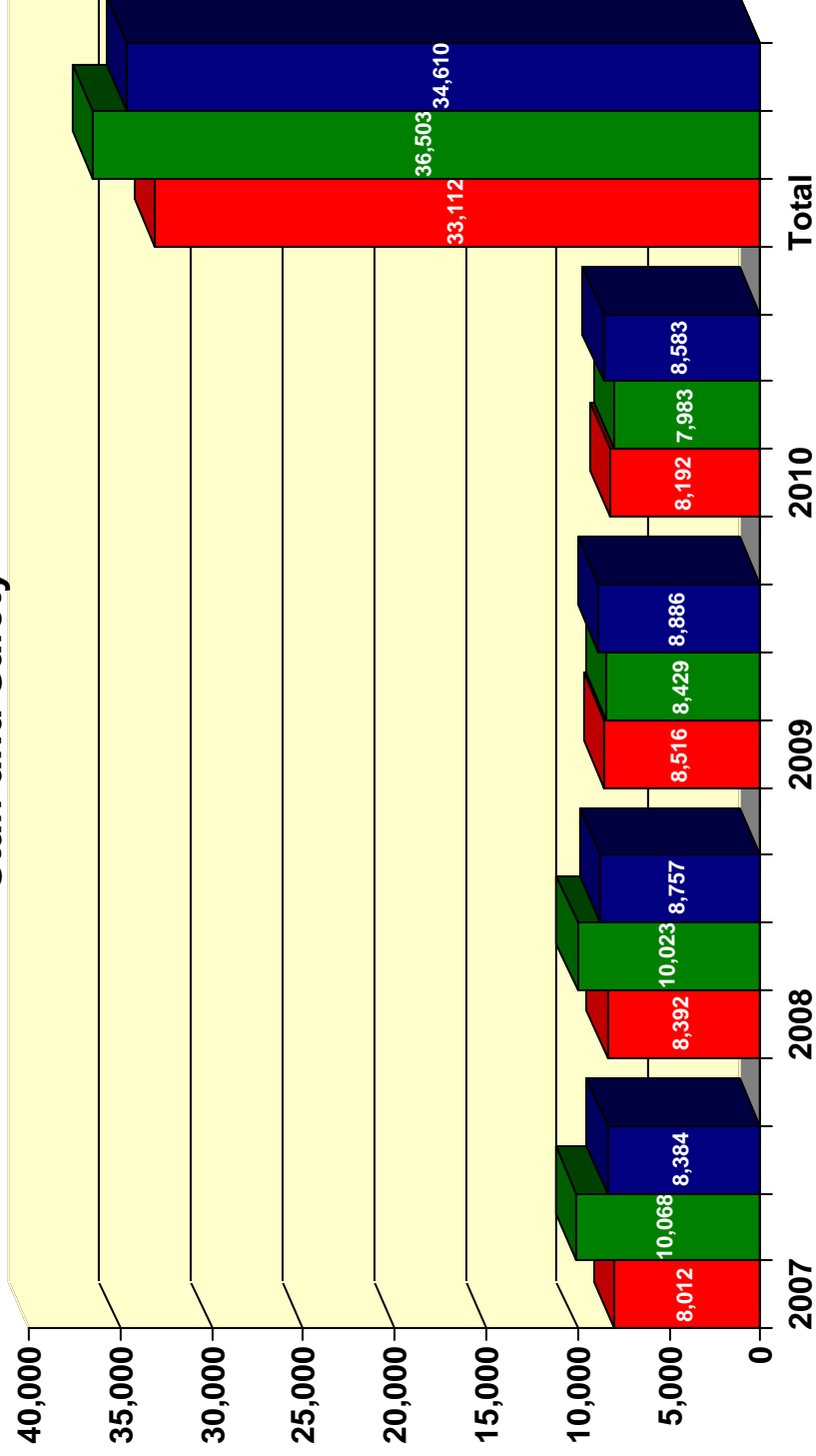


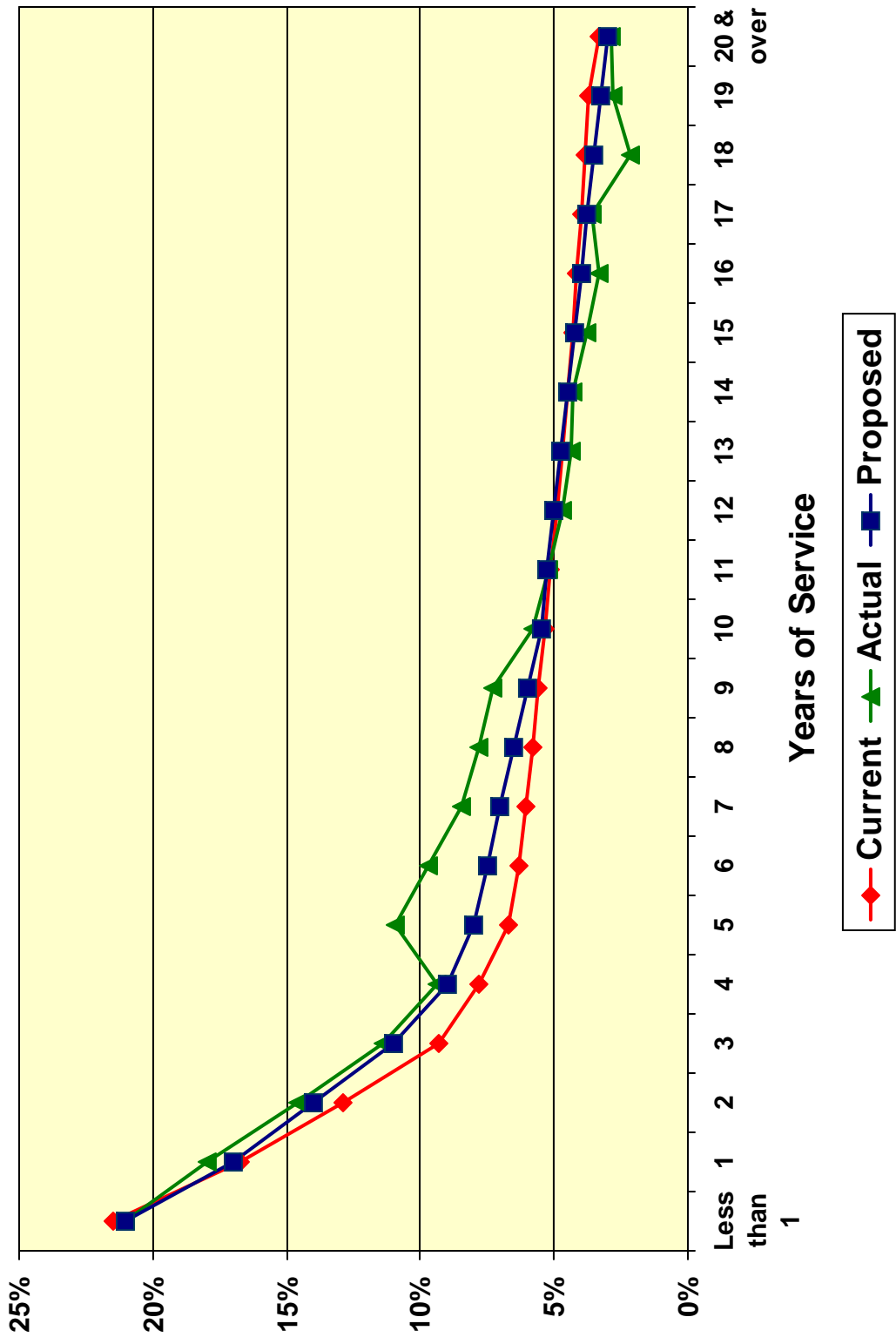
Chart 15
Actual Number of Terminations Compared to Expected -
Staff and Safety



Year ended June 30,

■ Expected - Current ■ Actual ■ Expected - Proposed

Chart 16
Termination Rates - Staff and Safety



E. DISABILITY INCIDENCE RATES

When a member becomes disabled, he or she is generally entitled to a Disability Income benefit if he or she had five or more years of Service Credit. Safety members are eligible for a duty disability without regard to years of Service Credit. The following summarizes the actual incidence of disabilities over the past four years compared to the current and proposed assumptions:

Rates of Disability Incidence – Males			
Age	Current Assumption	Actual Rate	Proposed Assumption
20 – 24	0.10%	0.00%	0.02%
25 – 29	0.11	0.00	0.04
30 – 34	0.14	0.02	0.07
35 – 39	0.19	0.02	0.10
40 – 44	0.24	0.06	0.15
45 – 49	0.30	0.15	0.20
50 – 54	0.39	0.27	0.35
55 – 59	0.54	0.20	0.35
60 – 64	0.54	0.28	0.35
65 & over	0.54	0.06	0.15

Rates of Disability Incidence – Females			
Age	Current Assumption	Actual Rate	Proposed Assumption
20 – 24	0.06%	0.00%	0.02%
25 – 29	0.09	0.00	0.04
30 – 34	0.11	0.02	0.07
35 – 39	0.19	0.04	0.10
40 – 44	0.29	0.11	0.20
45 – 49	0.42	0.18	0.30
50 – 54	0.60	0.33	0.40
55 – 59	0.86	0.32	0.50
60 – 64	0.86	0.39	0.50
65 & over	0.86	0.15	0.20

Chart 17 compares the actual number of disabilities for males over the past four years to that expected under both the current and proposed assumptions. Chart 18 graphs the same information for females.

Chart 19 shows actual disablement rates for males, compared to the assumed and proposed rates. Chart 20 graphs the same information for females.

The proposed disability rates were significantly reduced to reflect the past four years experience. The actual incidence of disabilities during the four-year period was significantly lower than that expected under the current assumptions. This was most significant at the higher end of the age ranges (i.e., 55 and over). Larger changes have been made to the disability incidence rates at those ages. This is also consistent with the disability experience from the four-year period before this study.

Chart 17
Actual Number of Disabilities Compared to Expected - Males

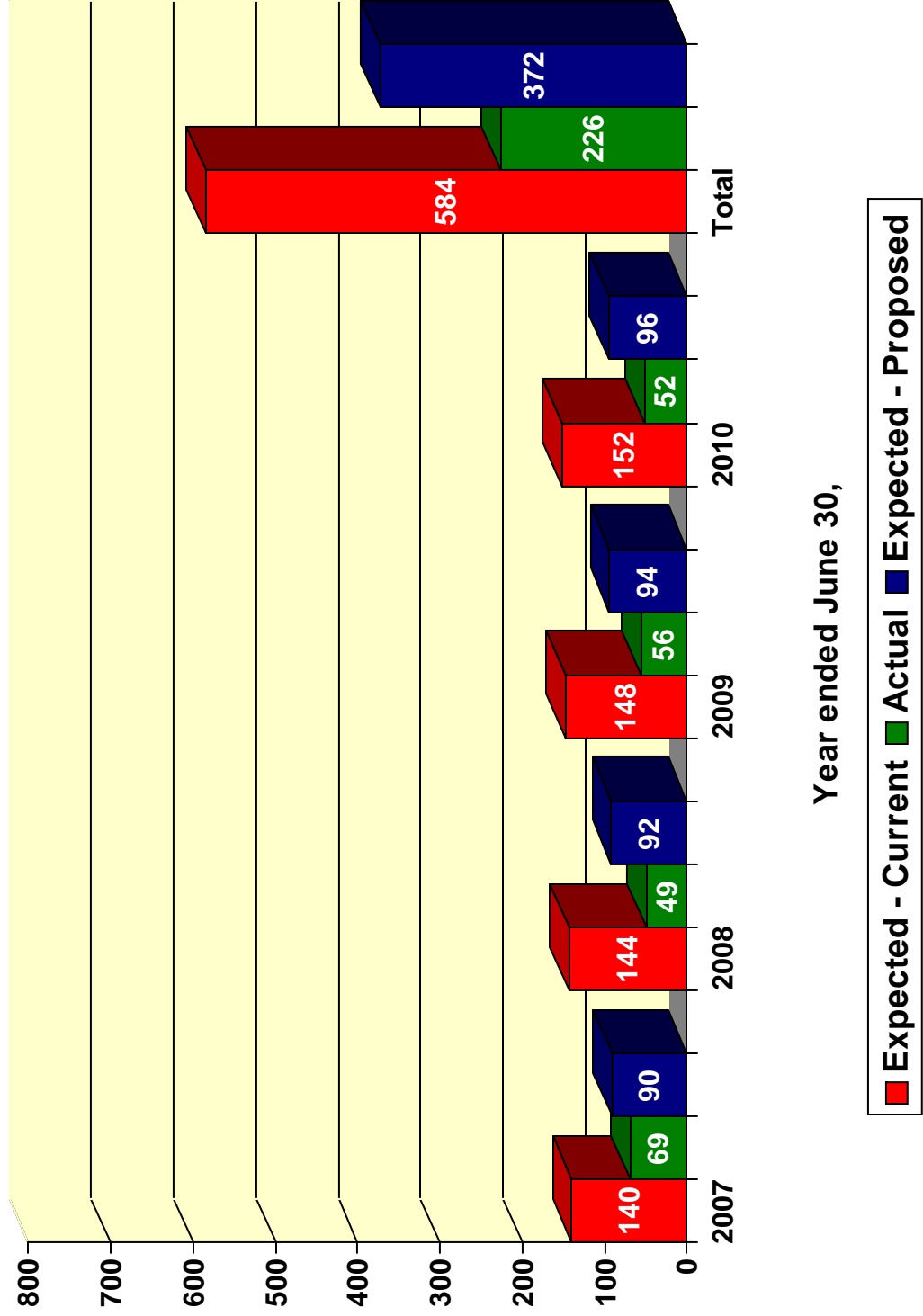
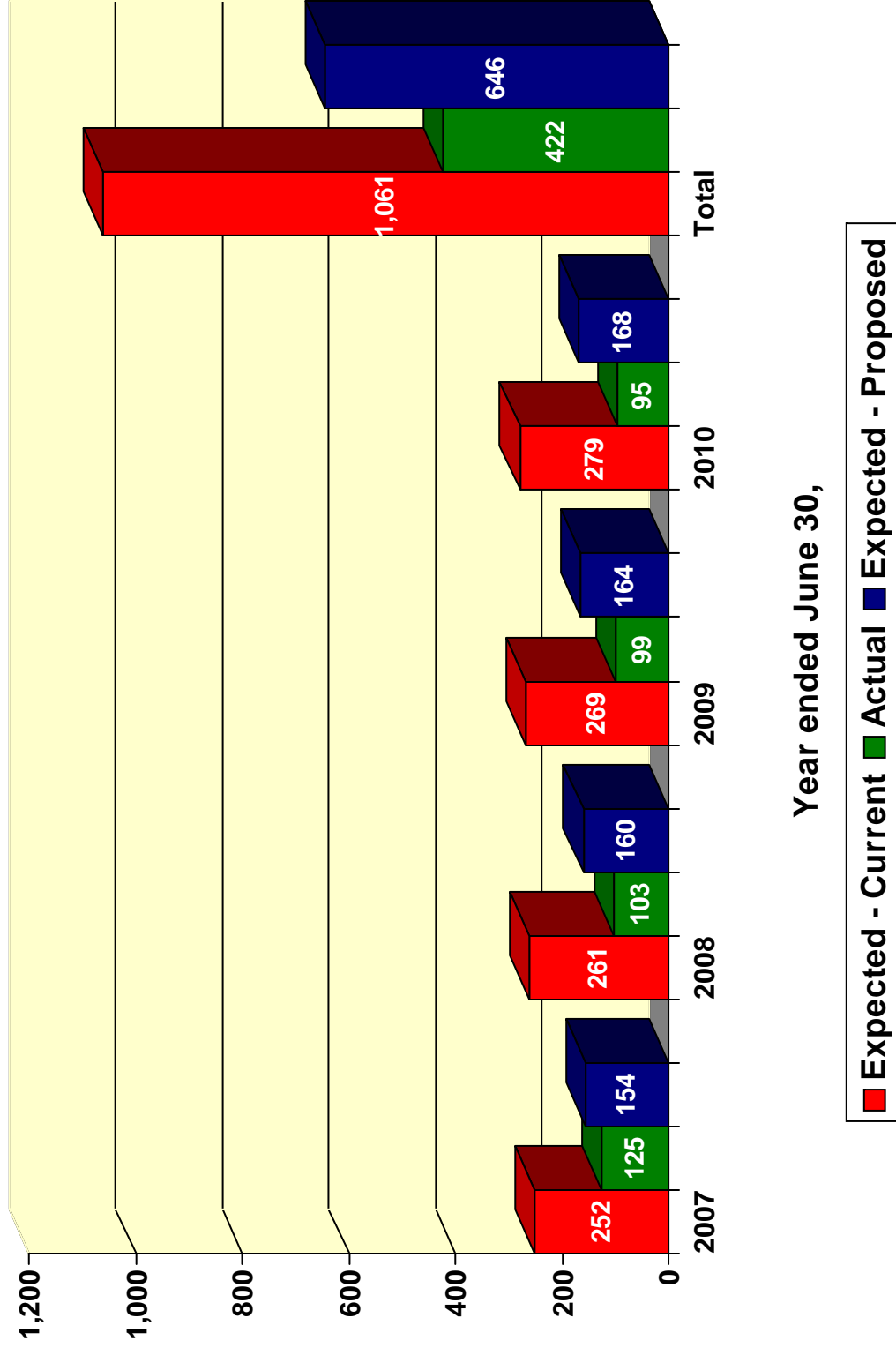


Chart 18
Actual Number of Disabilities Compared to Expected - Females



Year ended June 30,

Chart 19
Disablement Rates - Males

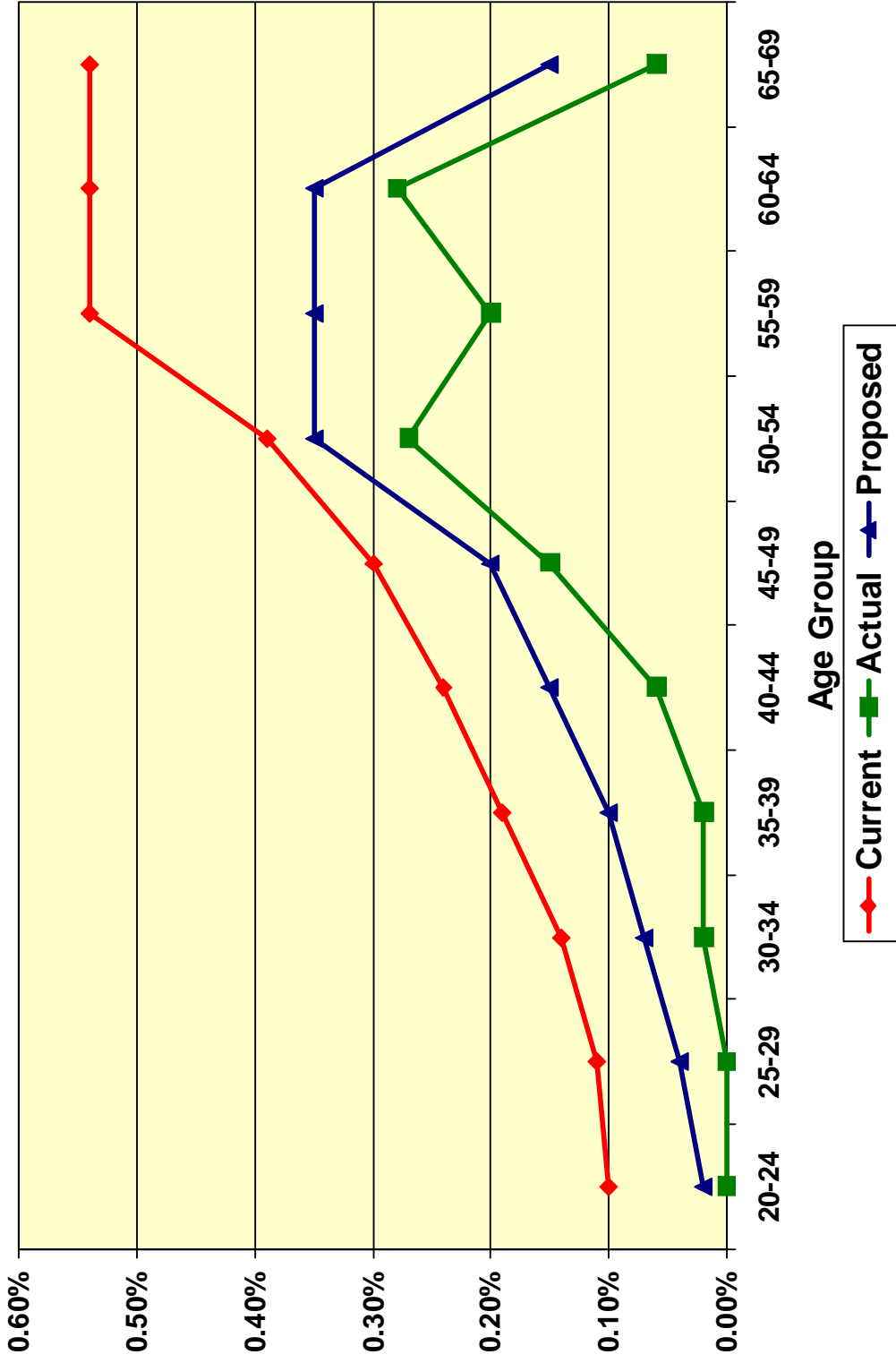
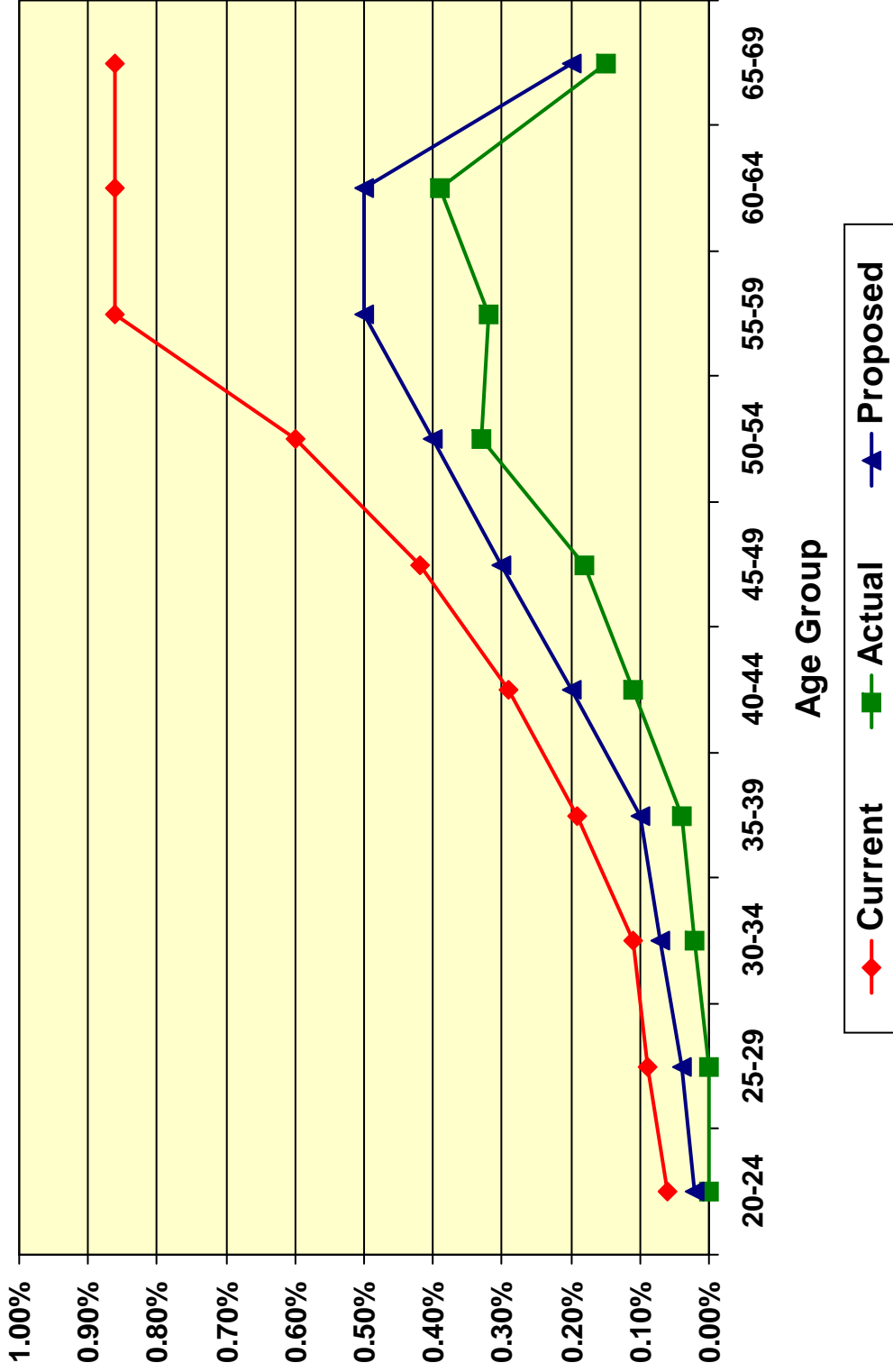


Chart 20
Disablement Rates - Females



F. ELIGIBLE SURVIVOR ASSUMPTIONS

For members that are not assumed to elect a Lump Sum Cashout, we assume that the Basic Retirement Income (BRI) option is elected. Upon the death of a member whose benefit is coordinated with Social Security, this option provides Eligible Survivors with a benefit of 25% of the benefit the member was receiving before their death. For members whose benefits are not coordinated with Social Security and for Safety members the benefit is 50% of the benefit the member was receiving before their death. For those members without Eligible Survivors, however, there is no annuity death benefit payable upon the member’s death under the BRI option. Therefore, the percentage of members who have an Eligible Survivor impacts the value of this benefit. Currently, we assume that 85% of males and 65% of females will have an Eligible Survivor at time of death.

We reviewed new retirees (excluding terminations who were eligible to retire and elect Lump Sum Cashouts) during the four-year period and determined the actual percentage of these new retirees that had an Eligible Spouse or Eligible Domestic Partner at the time of retirement. The results of that analysis are shown below:

New Retirees – Actual Percent with Eligible Spouse or Domestic Partner

Year Ending June 30,	Male	Female
2007	79%	58%
2008	79%	57%
2009	80%	56%
2010	78%	56%
Total	79%	57%

UCRP’s experience during this four-year period is very consistent with the experience during the previous four-year period and is somewhat lower than what was assumed. We recommend maintaining the current assumption for the percent with Eligible Survivors at 85% for males at all ages and 65% for females at all ages. Setting this assumption above the actual experience will allow for some conservatism in the assumption to account for those that have Eligible Survivors that are neither Eligible Spouses nor Eligible Domestic Partners. There may also be a gradual increase in Eligible Survivors over time due to the recent extension of benefits to Eligible Domestic Partners.

Chart 21 shows the actual percent with Eligible Survivors separately for males and females, along with the assumed and proposed percentages.

Since the value of the Eligible Survivor’s benefit is dependent on his/her age and sex, we must also have assumptions for the age and sex of the Eligible Survivor. Based on the experience during the four-year period and studies done for other retirement systems we believe that the current assumptions (shown below) are reasonable. Since the majority of Eligible Survivors are expected to be of the opposite sex, even with the inclusion of Eligible Domestic Partners, we will continue to assume that the Eligible Survivor’s sex is the opposite of the member. This assumption will continue to be monitored in future experience studies.

The current and recommended assumption for the age of the Eligible Survivor is shown below:

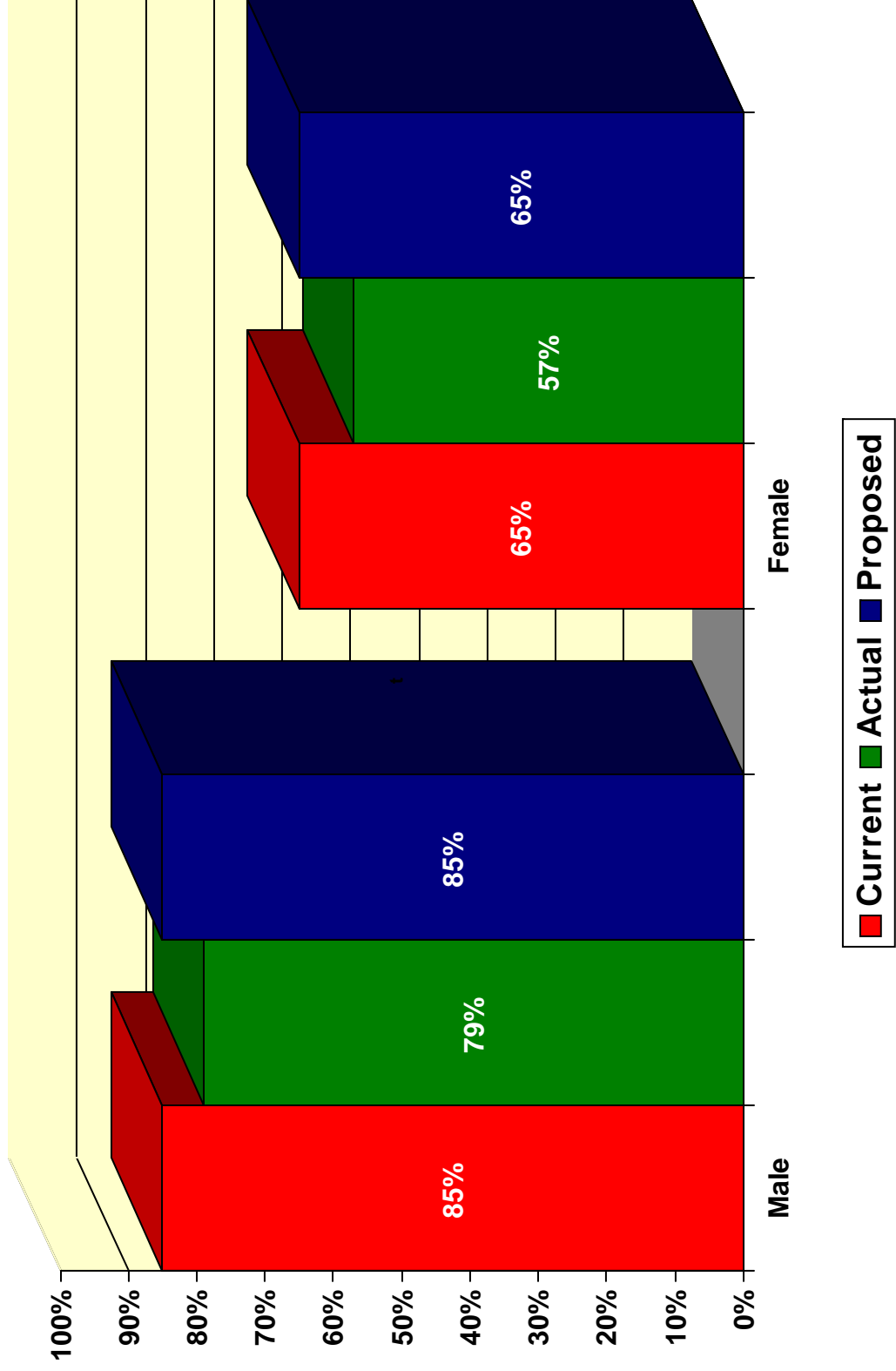
Eligible Survivor Ages – Current Assumptions		
Beneficiary Sex	Eligible Survivor’s Age as Compared to Member’s Age	
	Current Assumption	Recommended Assumption
Male	3 years older	No change
Female	3 years younger	No change

We also have an assumption for the number of Eligible Survivors per active member with Eligible Survivors. This is necessary because disability benefits and pre-retirement death benefits for members whose benefits are not coordinated with Social Security are based on how many Eligible Survivors the member has. The current assumption is shown below:

Number of Eligible Survivors (Sample Ages)		
Age	Number of Eligible Survivors per Active Member with Survivors	
	Male	Female
20	1.0	1.0
25	1.8	2.1
30	2.2	2.7
35	2.7	2.8
40	3.0	2.4
45	2.8	2.1
50	2.5	1.7
55	2.0	1.4
60	1.5	1.2
65	1.3	1.1

Because this assumption only applies to the death and disability decrements for members that are not coordinated with Social Security, who are now less than 2% of the population, this assumption has very little impact on the valuation and also very little experience data. For those reasons, we recommend maintaining the current assumption.

Chart 21
Percent with Eligible Survivors



G. SERVICE FROM UNUSED SICK LEAVE CONVERSION

At retirement, members can convert their unused sick leave to increase the Service Credit used in the calculation of their retirement benefit. Members must retire within 120 days of their separation from service to be allowed to convert their unused sick leave. Also, Plan provisions specify that members electing a Lump Sum Cashout do not have Service Credit from unused sick leave included in the calculation of their Lump Sum Cashout.

We collected information on the actual amount of sick leave converted to Service Credit for retirees during the four-year period studied. This information was compared against the current assumption to determine if the current assumption for unused sick leave converted to Service Credit expressed as a percentage of total Service Credit (before including the sick leave converted to Service Credit) is reasonable.

The tables below show the actual sick leave converted to Service Credit as a percentage of total Service Credit (before including the sick leave converted to Service Credit) at retirement separately for Faculty, Staff and Safety members. This includes only those members who retired from active membership, are not receiving Disability Income and did not elect to take a Lump Sum Cashout.

Faculty New Retirees (Non-disability and excluding Lump Sum Cashouts)

Year of Retirement	Current Assumption	Actual Rate	Proposed Assumption
2006 – 2010	0.15%	0.12%	0.13%

Staff New Retirees (Non-disability and excluding Lump Sum Cashouts)

Year of Retirement	Current Assumption	Actual Rate	Proposed Assumption
2006 – 2010	1.40%	1.52%	1.45%

Safety New Retirees (Non-disability and excluding Lump Sum Cashouts)

Year of Retirement	Current Assumption	Actual Rate	Proposed Assumption
2006 – 2010	2.25%	1.81%	2.00%

Chart 22 shows the same information in graphical format.

Note that some Faculty members have earned sick leave from a prior appointment at the University.

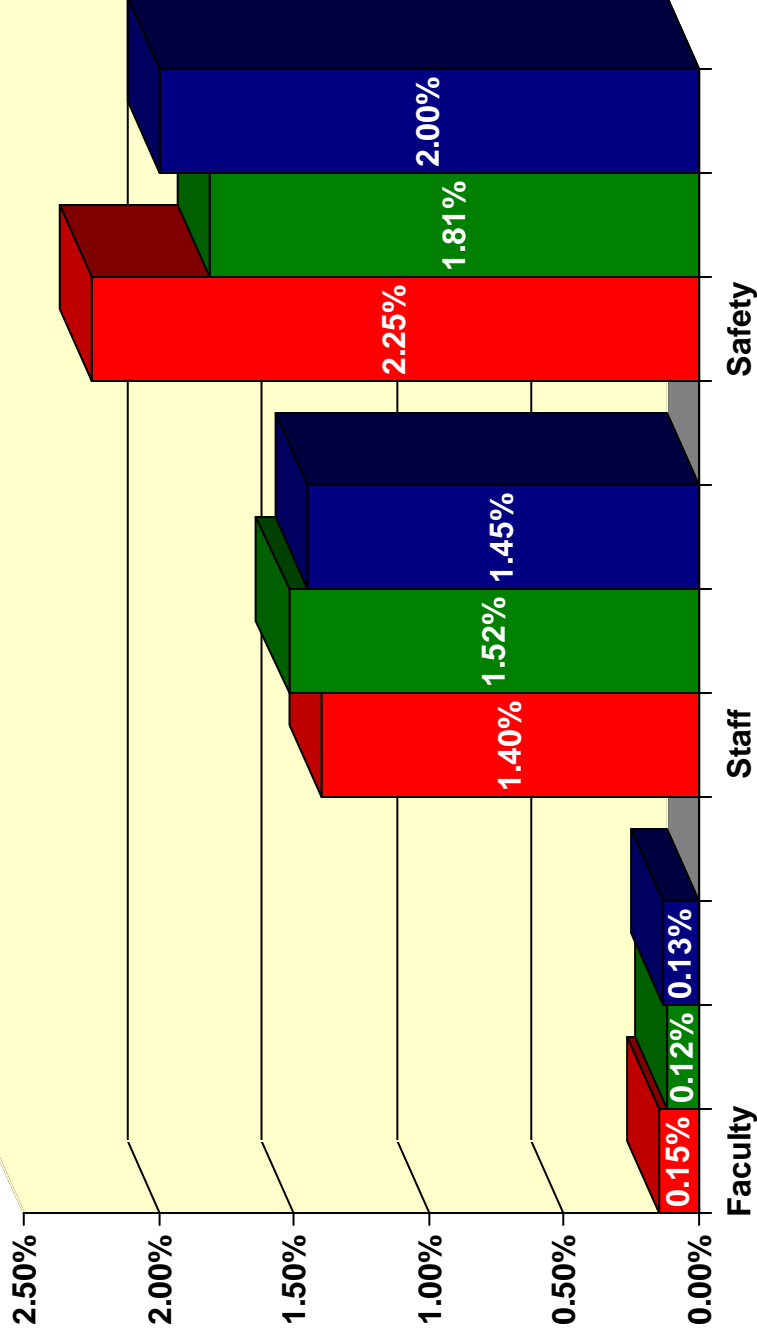
We are recommending a decrease in the assumption for service from unused sick leave conversion at retirement for Faculty and Safety members and an increase for Staff members based on the experience during the four-year period. Like some of our recommendations in this report, the proposed changes are not based solely on fully recognizing the actual experience over the four-year period. Rather, the proposed assumptions are a blend based on the actual experience during this four-year period, the previous four-year period and the current assumption. We will continue to monitor this assumption as more actual experience becomes available.

We are not recommending the introduction of an assumption for service from unused sick leave conversion for any retirements other than those non-disability retirements that occur from active membership and do not elect a Lump Sum Cashout. This is based on the following reasons:

- For those that do not retire immediately from active membership, they will in most instances retire more than 120 days after they separated from active membership and therefore will not be able to convert unused sick leave to Service Credit at retirement.
- For those that elect a Lump Sum Cashout at termination we understand that their Service Credit from unused sick leave conversion is not included in the calculation of their Lump Sum Cashout.
- For those that become disabled or die from active membership, we determined that there is minimal Service Credit from unused sick leave converted due to these individuals having less time to accumulate sick leave to be converted before their disablement or death occurs. This is in contrast to members that retire from active membership, who have more years to accumulate sick leave to be converted upon their retirement. Also, disabled members may have more need to use their sick leave prior to disability retirement.

Chart 22

Service Credit from Unused Sick Leave Conversion as a % of
Total Service Credit (before Unused Sick Leave Conversion)



Includes New Non-disability retirements
(excluding Lump Sum Cashouts)

Expected - Current Actual Expected - Proposed

H. LUMP SUM CASHOUT TAKE-RATE

At termination, members who are eligible to retire can elect to have their benefit paid in the form of a one-time Lump Sum Cashout (LSC). We collected information on the actual number of members electing an LSC during the four-year period studied. This information was used to develop the Lump Sum Cashout take-rate assumption.

Currently, the LSC take-rate assumptions are not a function of age or years of service. We did analyze LSC take-rates by years of service. Our review concluded:

- For members terminating from active membership who are eligible to retire, we observed that LSC take-rates correlated well with years of service. The take-rates for these members are higher at lower years of service and decline over time. This is mainly due to the fact that members forego retiree health benefits if they elect an LSC. Generally, members with ten or more years of service would be eligible for retiree health benefits at retirement and those benefits increase gradually as service increases to twenty years.
- For members electing an LSC from inactive status or “crossing over” from disabled status, LSC take-rates did not vary as significantly based on years of service. Note that any members retiring from inactive status already forego their retiree health benefits.

Therefore, we recommend that LSC take-rates be:

1. Structured as a function of years of service for those terminating from active membership that are eligible for retirement.
2. Maintained as a flat percentage regardless of years of service for all other Lump Sum Cashouts.

The following tables show the actual percentage of members that elected an LSC by years of service. Tables are shown separately for members terminating from active membership, inactive (deferred vested) status and also for those whose disability income ends when they “cross over”. Also shown are the current rates assumed and the rates we propose.

New LSC Elections from Active Membership

Year of Service	Current Assumptions	Actual Percentage Electing a Lump Sum Cashout	Proposed Assumptions
5 & Under	12.00%	46.76%	30.00%
6	12.00	48.04	30.00
7	12.00	48.67	30.00
8	12.00	45.45	30.00
9	12.00	22.54	30.00
10	12.00	19.69	15.00
11	12.00	17.81	15.00
12	12.00	16.37	15.00
13	12.00	17.70	15.00
14	12.00	12.40	15.00
15	12.00	15.30	12.50
16	12.00	13.78	12.50
17	12.00	9.88	12.50
18	12.00	12.01	12.50
19	12.00	9.56	12.50
20	12.00	11.45	7.50
21	12.00	7.14	7.50
22	12.00	7.20	7.50
23	12.00	5.36	7.50
24	12.00	6.47	7.50
25	12.00	6.59	5.00
26	12.00	7.75	5.00
27	12.00	5.20	5.00
28	12.00	7.81	5.00
29	12.00	1.89	5.00
30 & Over	12.00	3.44	5.00

New LSC Elections from Inactive (Deferred Vested) Status

Year of Service	Current Assumptions	Actual Percentage Electing a Lump Sum Cashout	Proposed Assumptions
5 & Under	45.00%	54.67%	45.00%
6	45.00	55.56	45.00
7	45.00	53.54	45.00
8	45.00	47.90	45.00
9	45.00	49.76	45.00
10	45.00	46.51	45.00
11	45.00	50.36	45.00
12	45.00	51.11	45.00
13	45.00	54.07	45.00
14	45.00	54.00	45.00
15	45.00	48.91	45.00
16	45.00	40.23	45.00
17	45.00	46.34	45.00
18	45.00	43.40	45.00
19	45.00	48.15	45.00
20	45.00	32.00	45.00
21	45.00	47.27	45.00
22	45.00	42.22	45.00
23	45.00	39.39	45.00
24	45.00	35.71	45.00
25	45.00	37.04	45.00
26	45.00	26.47	45.00
27	45.00	21.43	43.00
28	45.00	13.33	45.00
29	45.00	27.59	45.00
30 & Over	45.00	20.59	45.00

New LSC Elections at “Cross Over” from Disability Status

Year of Service	Current Assumptions	Actual Percentage Electing a Lump Sum Cashout	Proposed Assumptions
5 & Under	12.00%	25.40%	13.00%
6	12.00	17.65	13.00
7	12.00	10.81	13.00
8	12.00	14.29	13.00
9	12.00	27.27	13.00
10	12.00	13.16	13.00
11	12.00	10.26	13.00
12	12.00	7.69	13.00
13	12.00	11.90	13.00
14	12.00	11.90	13.00
15	12.00	10.00	13.00
16	12.00	17.39	13.00
17	12.00	3.70	13.00
18	12.00	20.00	13.00
19	12.00	15.00	13.00
20	12.00	16.67	13.00
21	12.00	11.11	13.00
22	12.00	11.11	13.00
23	12.00	12.50	13.00
24	12.00	5.88	13.00
25	12.00	20.00	13.00
26	12.00	8.33	13.00
27	12.00	33.33	13.00
28	12.00	16.67	13.00
29	12.00	33.33	13.00
30 & Over	12.00	4.55	13.00

Charts 23 through 25 show the same information in graphical format.

Based on the experience during the four-year period we recommend the introduction of a service-based LSC take-rate assumption for members terminating from active membership that are eligible to retire, with rates ranging from 5% to 30%. This compares to the current assumption of 12% for all members terminating from active membership, regardless of years of service. The proposed rates are increases for those with less than about fifteen years of service and decreases for those with more than about twenty years of service. For inactive (deferred vested) members we recommend maintaining the 45% LSC take-rate assumption. For “crossovers” from disability we recommend increasing the LSC take-rate assumption from 12% to 13%. The proposed changes are not based solely on fully recognizing the actual experience over the four-year period, but instead are based on a blend of the actual experience during the four-year period and the current assumption. This assumption will continue to be monitored closely as more experience becomes available.

Chart 23
Lump Sum Cashout Take-Rate -
Active Members

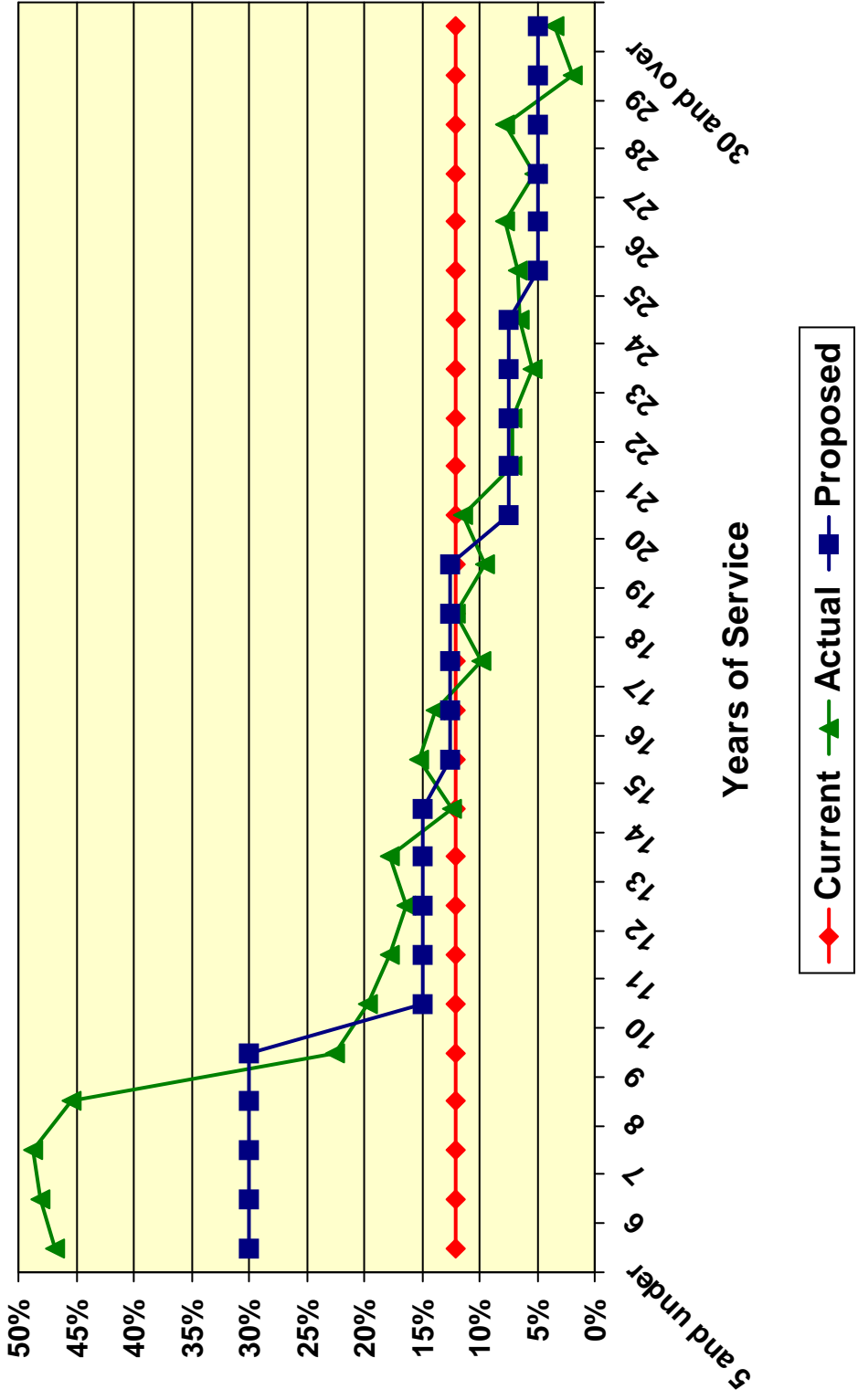


Chart 24
Lump Sum Cashout Take-Rate -
Inactive (Deferred Vested) Members

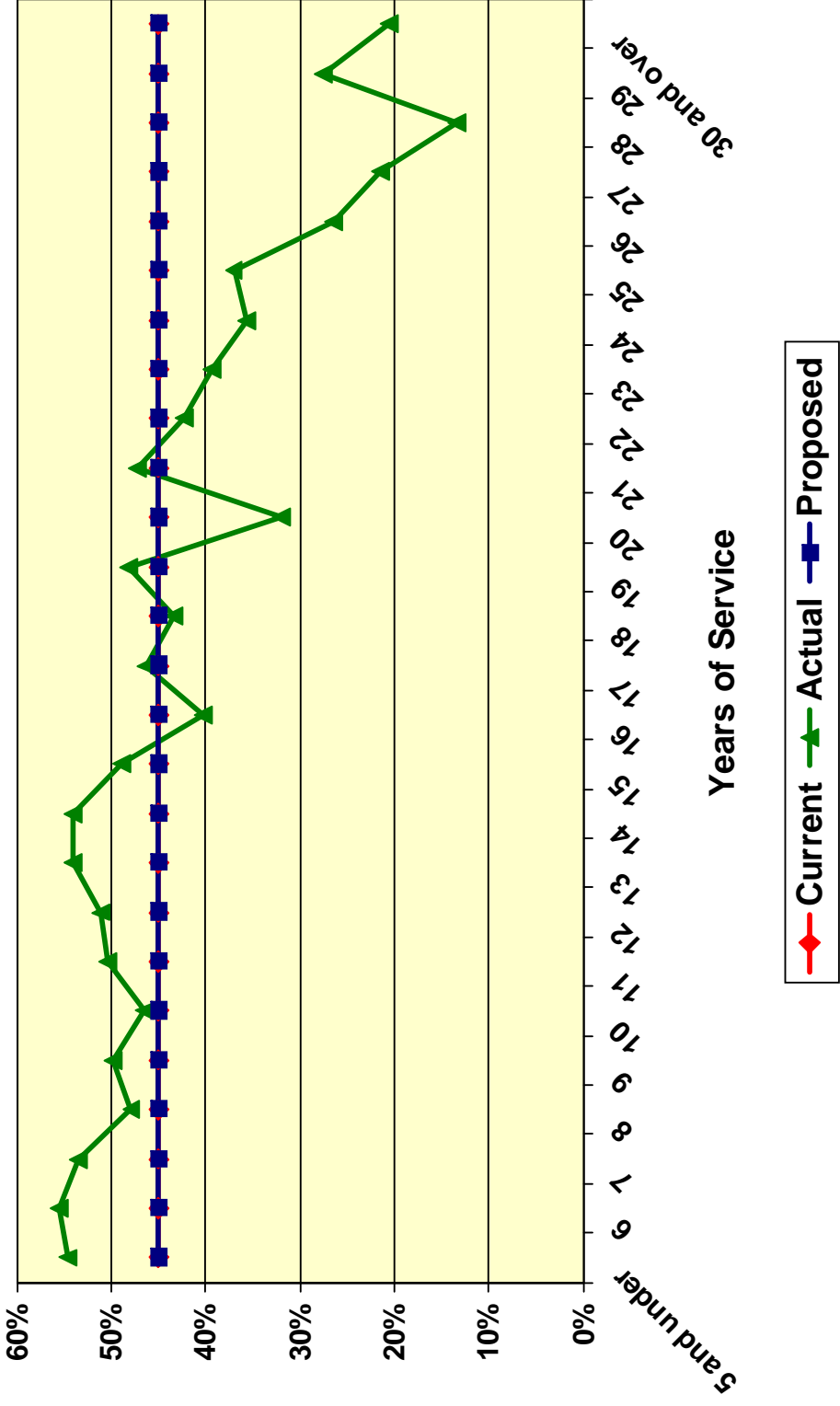
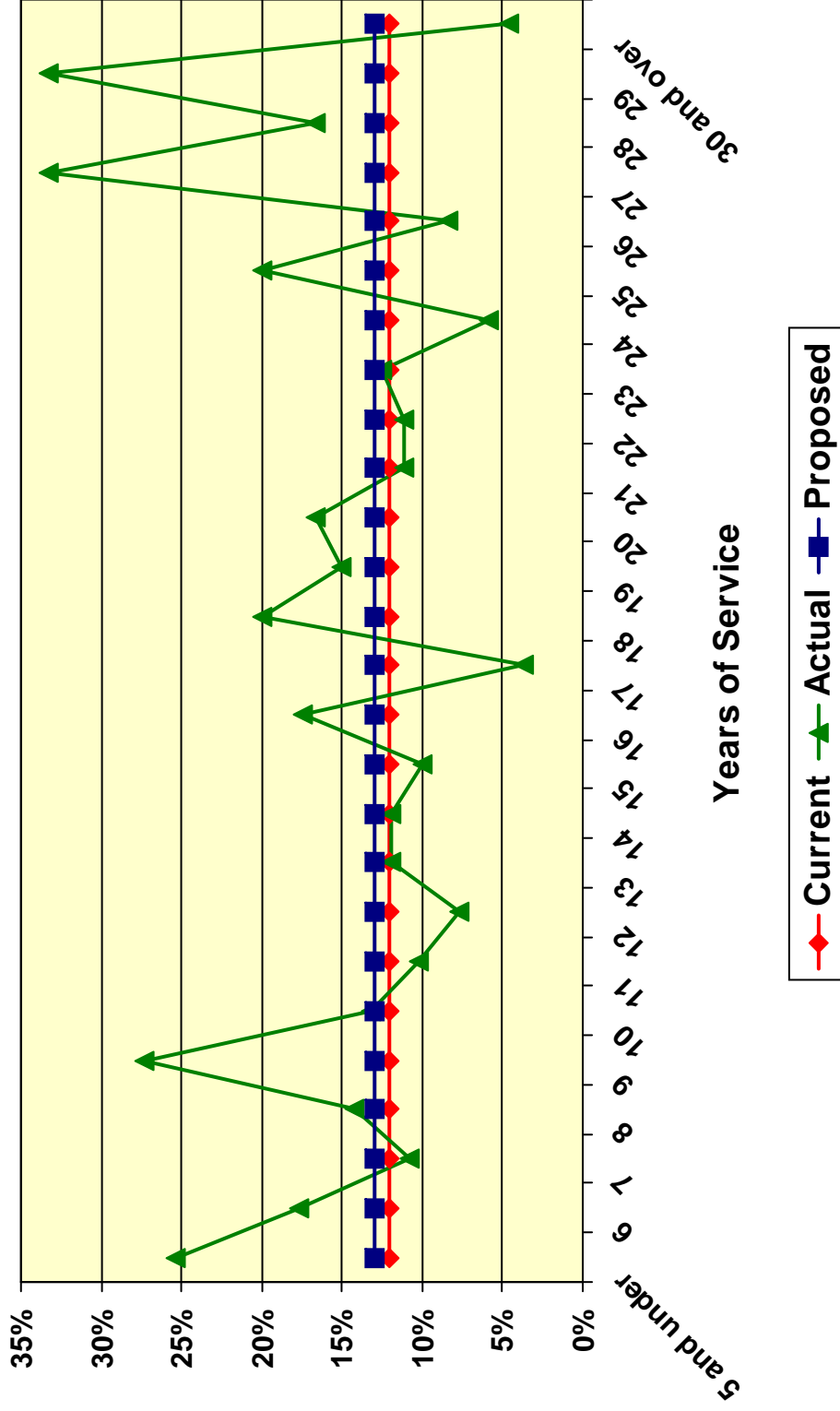


Chart 25
Lump Sum Cashout Take-Rate -
Disability "Crossovers"



I. FUTURE BENEFIT ACCRUALS

Benefits under the Plan are based on the service credit and compensation earned by the member. In order to project benefits and determine the liabilities, an assumption about the amount of Service Credit earned by members each year is necessary.

Over the last four years, the average service credit earned by continuing active members from one valuation date to the next was 0.94 service credit. Based on this actual experience, we recommend continuing to assume that all members earn full-time service (or 1.00 service credit) per year in the future. Compensation for those members that actually earned less than a full year of service credit in a particular year will be projected to be full-time equivalent for future years.

J. ADMINISTRATIVE EXPENSES

Like benefit payments made to members, expenses incurred in connection with the Plan's operation are paid from Plan assets. These expenses include fees for administrative, legal, accounting, and actuarial services, as well as routine costs for printing, mailings, computer-related activities, and other functions carried out by the Plan. They generally do not include investment-related expenses. In order to reflect future administrative expenses in the Plan's funding costs, a 0.50% of payroll load is currently added to the Plan's normal cost. In operation, the actual amount of expenses has been about equal to those expected over the four-year period.

To more accurately reflect administrative expenses as a percentage of active payroll in the future, we have expressed the actual total administrative expenses as a percentage of valuation payroll for the last four years excluding the payroll for the Los Alamos National Laboratory (LANL) and the Lawrence Livermore National Laboratory (LLNL). This information is shown in the table below.

Administrative Expenses as a Percentage of Valuation Payroll (All dollars in 000's)

Year Ending June 30	Valuation Payroll* at Beginning of Plan Year	Total Administrative Expenses	Total %
2010	\$7,873,644	\$32,656	0.41%
2009	7,468,809	32,449	0.43%
2008	6,930,772	36,556	0.53%
2007	6,328,367	38,918	<u>0.61%</u>
Average			0.50%

* Excludes LANL and LLNL payroll.

Based on this experience and future expectations, we do not recommend a change at this time and recommend keeping the assumption at 0.50% of payroll per year.

V. COST IMPACT OF ASSUMPTION CHANGES

The following table shows the changes in funding elements due to the proposed assumption changes (including the effect of the proposed changes to the assumptions used for annuity option factors and Lump Sum Cashout factors) as if they were applied to the July 1, 2010 actuarial valuation. If all of the proposed assumption changes were implemented, the Plan's Normal Cost as a dollar amount would have increased by \$14 million (1.0%) and the Actuarial Accrued Liability (AAL) would have increased by \$1.77 billion (3.7%). The total funding policy contribution would have increased from 23.25% to 25.50% of payroll.

Funding Elements for Plan Year Beginning July 1, 2010

	Current Assumptions (\$ in 000s)	Proposed Assumptions (\$ in 000s)
Normal cost (beginning of year)	\$1,354,302	\$1,367,988
Percentage of payroll (beginning of year)	16.94%	17.12%
Percentage of payroll (middle of year)	17.56%	17.75%
Market value of assets	\$34,574,454	\$34,574,454
Actuarial value of assets (AVA)	41,195,318	41,195,318
Actuarial accrued liability (AAL)	47,504,309	49,269,872
Unfunded/(Overfunded) actuarial accrued liability	6,308,991	8,074,554
Funded ratio on actuarial value basis (AVA/AAL)	86.7%	83.6%
Funded ratio on market value basis (MVA/AAL)	72.8%	70.2%
Covered Payroll	7,944,437	7,988,613
Total funding policy contribution:		
Percentage of payroll*	23.25%	25.50%
Estimated annual dollar amount**	\$1,867,921	\$2,052,104

* Total funding policy contributions are for the Plan Year starting one year after the date of the actuarial valuation. The total funding policy contributions shown are for the non-laboratory segment of UCRP.

** Based on estimated covered payroll of \$8,034,068 (also in thousands) for the 2011-2012 Plan Year under the current assumptions and \$8,047,466 under the proposed assumptions. Actual contributions are set by The Regents.

The change to the mortality table was significant as it increased the Normal Cost by 0.5% of payroll and the AAL by \$1.6 billion. Changes to the assumptions for termination rates and disability incidence offset most of this increase in Normal Cost, but only slightly offset this increase in AAL. Note that per The Regents' funding policy, a fifteen-year period was used to amortize the increase in the UAAL due to the assumption changes when determining the total funding policy contribution. A summary of valuation results by UCRP segment is shown on the next page. We stress that this is an illustration based on applying the proposed assumptions to the previous valuation (2010).

Summary of UCRP July 1, 2010 Valuation Results by Segment (\$ in 000s) — Illustration Based on Proposed Assumptions

	Total UCRP	Campus and Medical Centers*	Lawrence Berkeley National Laboratory (LBNL)	Lawrence Livermore National Laboratory (LLNL)	Los Alamos National Laboratory (LANL)
Normal Cost (beginning of year)	\$1,367,988	\$1,324,978	\$43,010	\$0	\$0
Market value of assets	34,574,454	28,312,060	1,412,821	2,528,604	2,320,970
Actuarial value of assets (AVA)	41,195,318	33,733,692	1,683,364	3,012,820	2,765,442
Actuarial accrued liability (AAL)	49,269,872	40,577,903	1,609,323	3,852,194	3,230,452
Unfunded/(Overfunded) actuarial accrued liability	8,074,554	6,844,211	(74,041)	839,374	465,010
Funded Ratio (AVA/AAL)	83.6%	83.1%	104.6%	78.2%	85.6%
Estimated Covered Payroll for 2011-2012 Plan Year	\$8,308,157	\$8,047,466	\$260,691	\$0	\$0
Total funding policy contributions					
Percent of payroll**		25.50%	25.50%	N/A	N/A
Estimated dollar amount in 000s		\$2,052,104	\$66,476	N/A	N/A
Required Contractual Contributions***					
Estimated dollar amount in 000s		N/A	N/A	\$179,242	\$91,037

* Includes Hasting College of Law

** The illustrated total funding policy contributions shown for the campus and medical centers and LBNL segments would be for the Plan Year beginning July 1, 2011. Actual contributions for these two segments will be set by The Regents.

*** The illustrated contributions shown for the LLNL and LANL Retained Segments would be required for the Plan Year beginning July 1, 2010 under the terms of the University's contracts with the Department of Energy, and are due by February 29, 2012.

Note: Results may not add due to rounding.

APPENDIX A

CURRENT ACTUARIAL ASSUMPTIONS

Post – Retirement Mortality Rates:

Healthy: 1994 Group Annuity Reserving Mortality Table unloaded, projected with scale AA to 2002. Ages are set back two years for males (from the male table) and set back one year for females (from the female table).

Disabled: RP-2000 Disabled Retiree Mortality Table. Ages are set back two years for males (from the male table) and set back one year for females (from the female table).

Sample Termination Rates Before Retirement:

Age	Rate (%)					
	Healthy Mortality		Disabled Mortality*		Disability Incidence	
	Male	Female	Male	Female	Male	Female
20	0.04	0.03	2.26	0.75	0.10	0.06
25	0.06	0.03	2.26	0.75	0.10	0.08
30	0.08	0.03	2.26	0.75	0.12	0.10
35	0.09	0.04	2.26	0.75	0.17	0.16
40	0.10	0.06	2.26	0.75	0.22	0.25
45	0.13	0.09	2.26	0.75	0.28	0.36
50	0.20	0.12	2.64	1.06	0.36	0.53
55	0.33	0.21	3.29	1.55	0.47	0.75
60	0.60	0.40	3.93	2.08	0.54	0.86
65	1.10	0.79	4.66	2.66	0.54	0.86

* Assumed to apply only while receiving UCRP Disability Income.

Sample Termination Rates Before Retirement (continued):

**Rate (%)
Withdrawal – Faculty**

	Less than one Year of Service	At least one, but less than two Years of Service	At least two, but less than three Years of Service	At least three, but less than four Years of Service	At least four, but less than five Years of Service	Five or more Years of Service
Age	Unisex	Unisex	Unisex	Unisex	Unisex	Unisex
20	24.00	22.00	21.00	21.00	13.00	9.00
25	23.00	20.00	19.00	17.00	11.00	8.00
30	22.00	14.00	12.00	11.00	10.00	7.00
35	19.00	11.00	9.00	7.00	7.00	6.00
40	16.00	10.00	8.00	6.00	5.00	4.00
45	15.00	8.00	6.00	5.00	4.00	3.00
50	14.00	6.00	5.00	4.00	3.00	2.00
55	13.00	5.00	4.00	3.00	3.00	1.00
60	12.00	4.00	3.00	3.00	2.00	1.00
65	11.00	3.00	2.00	2.00	1.00	1.00

**Rate (%)
Withdrawal – Staff and Safety**

	Less than one Year of Service	At least one, but less than two Years of Service	At least two, but less than three Years of Service	At least three, but less than four Years of Service	At least four, but less than five Years of Service	Five or more Years of Service
Age	Unisex	Unisex	Unisex	Unisex	Unisex	Unisex
20	27.00	24.00	21.00	16.00	15.00	13.00
25	26.00	23.00	20.00	15.00	14.00	12.00
30	24.00	21.00	17.00	14.00	13.00	10.00
35	22.00	17.00	14.00	11.00	10.00	8.00
40	19.00	14.00	11.00	8.00	7.00	6.00
45	17.00	11.00	9.00	6.00	5.00	4.00
50	14.00	9.00	7.00	5.00	4.00	2.00
55	12.00	7.00	6.00	4.00	3.00	2.00
60	11.00	6.00	5.00	3.00	2.00	1.00
65	10.00	5.00	4.00	2.00	1.00	1.00

Retirement Rates:

Retirement Probability – Unisex			
Age	Faculty	Staff	Safety
50	2.00%	4.00%	15.00%
51	1.00	4.00	10.00
52	1.00	4.00	10.00
53	1.00	4.00	10.00
54	1.00	5.00	10.00
55	2.00	5.00	25.00
56	2.00	6.00	25.00
57	2.00	6.00	25.00
58	2.00	8.00	25.00
59	3.00	14.00	25.00
60	5.00	20.00	25.00
61	5.00	20.00	25.00
62	5.00	20.00	50.00
63	5.00	20.00	50.00
64	7.00	25.00	75.00
65	8.00	30.00	100.00
66	9.00	25.00	100.00
67	10.00	25.00	100.00
68	12.00	25.00	100.00
69	15.00	25.00	100.00
70	15.00	20.00	100.00
71	12.00	20.00	100.00
72	12.00	20.00	100.00
73	12.00	20.00	100.00
74	12.00	20.00	100.00
75	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:

Deferred vested members are assumed to retire at age 59.

Form of Payment:

For those members not electing a Lump Sum Cashout:
 Life annuity for members without an Eligible Survivor;
 25% contingent annuity for members with Social Security who have an Eligible Survivor;
 50% contingent annuity for members without Social Security who have an Eligible Survivor;

50% contingent annuity for Safety members who have an Eligible Survivor.

It is also assumed that some members elect a Lump Sum Cashout (see Lump Sum Assumptions).

Future Benefit Accruals: 1.0 year of service per year for the full-time employees. Part-time employees are assumed to earn full-time service for all future years.

Definition of Active Members: All members of UCRP who are not separated from active membership as of the valuation date or have not started receiving a monthly pension on or before the valuation date.

Percent with Eligible Survivors: 85% of male members and 65% of female members are assumed to have Eligible Survivors at time of decrement.

Eligible Survivor Ages: Members assumed to have an opposite sex Eligible Spouse or Eligible Domestic Partner, with females three years younger than males.

Number of Survivors (Samples):

Age	Number of Survivors per Active Member with Survivors	
	Male	Female
20	1.0	1.0
25	1.8	2.1
30	2.2	2.7
35	2.7	2.8
40	3.0	2.4
45	2.8	2.1
50	2.5	1.7
55	2.0	1.4
60	1.5	1.2
65	1.3	1.1

Economic Assumptions

Net Investment Return: 7.50% (including 3.50% for inflation)

Consumer Price Index: Increase of 3.50% per year; COLA increases are assumed to be 2.00% per year.

Administrative Expenses:

0.50% of payroll added to normal cost.

Salary Increases:**Annual Rate of Compensation Increase**

Inflation: 3.50% per year, plus “across the board” salary increases of 0.25% per year, plus the following merit and promotional increases:

Years of Service	Faculty	Staff and Safety
Less than 1	3.25%	3.25%
1	3.25	3.00
2	3.25	2.80
3	3.25	2.50
4	3.25	2.20
5	3.25	2.00
6	3.20	1.80
7	3.10	1.70
8	3.00	1.60
9	2.90	1.50
10	2.80	1.40
11	2.70	1.30
12	2.60	1.20
13	2.50	1.10
14	2.40	1.00
15	2.30	0.90
16	2.20	0.80
17	2.10	0.75
18	2.00	0.70
19	1.75	0.65
20 & over	1.50	0.60

Actuarial Methods**Actuarial Value of Assets:**

The market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and the expected returns on a market value basis and is recognized over a five-year period.

Actuarial Cost Method:

Entry Age Normal Actuarial Cost Method. Entry Age is calculated as the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salaries, as if the current benefit accrual rate has always been in effect.

Covered Payroll:

Covered payroll for a Plan Year is determined by annualizing actual payroll for the prior Plan Year increased by the assumed rate of salary growth. Covered payroll is then reduced to anticipate members who leave active status during the year.

Other Actuarial Assumptions**Lump Sum Assumptions:**

<i>Discount Rate:</i>	7.50%
<i>COLA:</i>	2.00%
<i>Mortality:</i>	1994 Group Annuity Reserving Mortality Table unloaded for males, projected with scale AA to 2002, with ages set back three years.
<i>Take-rate:</i>	For those terminating from active membership and for those who were receiving a disability income and now “crossing over”, we are assuming that 12% elect a Lump Sum Cashout. For those members who are leaving inactive (deferred vested) status, we are assuming that 45% elect a Lump Sm Cashout.

Approximations:

<i>Sick Leave</i>	Service has been increased by 0.15% for Faculty, 1.40% for Staff, and 2.25% for Safety members to account for unused sick leave. This assumption applies only for members retiring from active membership and not electing a Lump Sum Cashout. For all other benefits there is assumed to be no conversion of unused sick leave to service credit.
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APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS

Post – Retirement Mortality Rates:

Healthy: RP-2000 Combined Healthy Mortality Table projected with scale AA to 2025. Ages are set back two years for males (from the male table) and females (from the female table).

Disabled: RP-2000 Disabled Retiree Mortality Table projected with scale AA to 2025. Ages are set back two years for males (from the male table).

Sample Termination Rates Before Retirement:

Age	Rate (%)					
	Healthy Mortality		Disabled Mortality*		Disability Incidence	
	Male	Female	Male	Female	Male	Female
20	0.02	0.01	1.43	0.49	0.02	0.02
25	0.03	0.01	1.55	0.52	0.03	0.03
30	0.03	0.02	1.99	0.58	0.06	0.06
35	0.06	0.03	1.99	0.57	0.09	0.09
40	0.08	0.04	1.94	0.51	0.13	0.16
45	0.10	0.06	1.71	0.50	0.18	0.26
50	0.12	0.09	1.76	0.75	0.29	0.36
55	0.18	0.16	1.98	1.35	0.35	0.46
60	0.35	0.35	2.63	1.93	0.35	0.50
65	0.70	0.67	3.27	2.47	0.23	0.32

* Assumed to apply only while receiving UCRP Disability Income.

Sample Termination Rates Before Retirement (continued):

Years of Service	Rate (%) Withdrawal*	
	Faculty	Staff and Safety
Less than 1	19.00	21.00
1	12.00	17.00
2	8.00	14.00
3	7.00	11.00
4	6.00	9.00
5	5.75	8.00
6	5.50	7.50
7	5.25	7.00
8	5.00	6.50
9	4.75	6.00
10	4.50	5.50
11	4.25	5.25
12	4.00	5.00
13	3.75	4.75
14	3.50	4.50
15	3.25	4.25
16	3.00	4.00
17	2.75	3.75
18	2.50	3.50
19	2.25	3.25
20 & over	2.00	3.00

* The greater of a refund of member contributions and a deferred annuity is valued when a member withdraws. No withdrawal is assumed after a member is first assumed to retire.

Retirement Rates:

Retirement Probability – Unisex			
Age	Faculty	Staff*	Safety
50	2.00%	4.00%	20.00%
51	1.00	3.00	10.00
52	1.00	3.00	10.00
53	1.00	3.00	10.00
54	1.00	4.00	10.00
55	2.00	4.00	20.00
56	2.00	5.00	20.00
57	2.00	6.00	25.00
58	2.00	7.00	25.00
59	3.00	10.00	25.00
60	5.00	14.00	25.00
61	5.00	16.00	30.00
62	5.00	18.00	40.00
63	5.00	18.00	50.00
64	7.00	20.00	60.00
65	9.00	25.00	100.00
66	10.00	22.00	100.00
67	11.00	22.00	100.00
68	12.00	22.00	100.00
69	15.00	22.00	100.00
70	15.00	20.00	100.00
71	12.00	20.00	100.00
72	12.00	20.00	100.00
73	12.00	20.00	100.00
74	12.00	20.00	100.00
75	100.00	100.00	100.00

* These rates apply for those with ten to twenty years of service. For ages under 65, 60% of these rates will be used for those with less than ten years of service and 150% of these rates will be used for those with twenty or more years of service.

**Retirement Age and Benefit
for Deferred Vested Members:**

Deferred vested members are assumed to retire at age 59.

Form of Payment:

For those members not electing a Lump Sum Cashout:

Life annuity for members without an Eligible Survivor;

25% contingent annuity for members with Social Security who have an Eligible Survivor;

50% contingent annuity for members without Social Security who have an Eligible Survivor;

50% contingent annuity for Safety members who have an Eligible Survivor.

It is also assumed that some members elect a Lump Sum Cashout (see Lump Sum Assumptions).

Future Benefit Accruals:

1.0 year of service per year for the full-time employees. Part-time employees are assumed to earn full-time service for all future years.

Definition of Active Members:

All members of UCRP who are not separated from active membership as of the valuation date or have not started receiving a monthly pension on or before the valuation date.

Percent with Eligible Survivors:

85% of male members and 65% of female members are assumed to have Eligible Survivors at time of decrement.

Eligible Survivor Ages:

Members assumed to have an opposite sex Eligible Spouse or Eligible Domestic Partner, with females three years younger than males.

Number of Survivors (Samples):

Age	Number of Survivors per Active Member with Survivors	
	Male	Female
20	1.0	1.0
25	1.8	2.1
30	2.2	2.7
35	2.7	2.8
40	3.0	2.4
45	2.8	2.1
50	2.5	1.7
55	2.0	1.4
60	1.5	1.2
65	1.3	1.1

Economic Assumptions

- Net Investment Return:** 7.50% (including 3.50% for inflation)
- Consumer Price Index:** Increase of 3.50% per year; COLA increases are assumed to be 2.00% per year.
- Administrative Expenses:** 0.50% of payroll added to normal cost.
- Salary Increases:**

Annual Rate of Compensation Increase

Inflation: 3.50% per year, plus “across the board” salary increases of 0.50% per year, plus the following merit and promotional increases:

<u>Years of Service</u>	<u>Faculty</u>	<u>Staff and Safety</u>
Less than 1	2.75%	2.75%
1	2.75	2.50
2	2.75	2.30
3	2.75	2.10
4	2.75	1.90
5	2.70	1.70
6	2.65	1.50
7	2.60	1.40
8	2.50	1.30
9	2.40	1.20
10	2.30	1.10
11	2.20	1.00
12	2.10	0.90
13	2.00	0.80
14	1.90	0.70
15	1.80	0.60
16	1.70	0.50
17	1.60	0.45
18	1.50	0.40
19	1.30	0.35
20 & over	1.10	0.30

Actuarial Methods

- Actuarial Value of Assets:** The market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and the expected returns on a market value basis and is recognized over a five-year period.

Actuarial Cost Method: Entry Age Normal Actuarial Cost Method. Entry Age is calculated as the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salaries, as if the current benefit accrual rate has always been in effect.

Covered Payroll: Covered payroll for a Plan Year is determined by annualizing actual payroll for the prior Plan Year increased by the assumed rate of salary growth. Covered payroll is then reduced to anticipate members who leave active status during the year.

Other Actuarial Assumptions

Lump Sum Assumptions:

Discount Rate: 7.50%
COLA: 2.00%
Take-rate:

Members Terminating From Active Membership and Eligible to Retire	
Years of Service	Percentage Electing Lump Sum Cashout
Less than 10	30.0%
10 – 14	15.0%
15 – 19	12.5%
20 – 24	7.5%
25 & over	5.0%

For those who were receiving a disability income and now “crossing over”, we are assuming that 13% elect a Lump Sum Cashout. For those members who are leaving inactive (deferred vested) status, we are assuming that 45% elect a Lump Sum Cashout.

Mortality: RP-2000 Combined Healthy Mortality Table projected with scale AA to 2025 set back two years; weighted 40% male and 60% female.

Approximations:

Sick Leave Service has been increased by 0.13% for Faculty, 1.45% for Staff, and 2.00% for Safety members to account for unused sick leave. This assumption applies only for members retiring from active membership and not electing a Lump Sum Cashout. For all other benefits there is assumed to be no conversion of unused sick leave to service credit.