**Kern County Employees'
Retirement Association**

ACTUARIAL EXPERIENCE STUDY

**Analysis of Actuarial Experience
During the Period
July 1, 2010 through June 30, 2013**

★ Segal Consulting

✳ Segal Consulting

June 30, 2014

Board of Retirement
Kern County Employees' Retirement Association
11125 River Run Boulevard
Bakersfield, CA 93301

**Re: Review of Non-economic Actuarial Assumptions for the June 30, 2014
       Actuarial Valuation**

Dear Members of the Board:

We are pleased to submit this report of our review of the actuarial experience of the
Kern County Employees' Retirement Association. This study has been conducted under the
amended schedule approved by the Retirement Board that bases the study on demographic
experience from July 1, 2010 to June 30, 2013. The study develops proposed actuarial
assumptions to be used in future actuarial valuations starting with the
June 30, 2014 actuarial valuation.

Please note that we have also reviewed the economic assumptions. The economic actuarial
assumption recommendations for the June 30, 2014 valuation are provided in a separate report.

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

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

Sincerely,

Paul Angelo, FSA, MAAA, FCA, EA   John W. Monroe, ASA, MAAA, EA
Senior Vice President and Actuary   Vice President and Associate Actuary

JAC/dar

TABLE OF CONTENTS

Page

Segal Consulting

I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS

To project the cost and liabilities of the pension 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 future contribution requirement is adjusted.

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

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

This study was undertaken in order to review the demographic actuarial assumptions and to compare the actual experience with that expected under the current assumptions during the three-year experience period from July 1, 2010 through June 30, 2013. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 35, "Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations" and ASOP No. 27 "Selection of Economic Assumptions for Measuring Pension Obligations." These Standards of Practice put forth guidelines for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected future experience, we are recommending various changes in the current actuarial assumptions.

The economic assumptions are currently reviewed every three years at the same time as the non-economic assumptions. See the separate report titled "Review of Economic Actuarial Assumptions for the June 30, 2014 Actuarial Valuation."

In this report we are recommending changes in the assumptions for retirement from active employment, reciprocal salary increases, pre-retirement mortality, healthy life post-retirement mortality, disabled life post-retirement mortality, turnover (including percent assumed to elect a refund of member contributions), disability (non-service connected and service connected) and promotional and merit salary increases.

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

Ref: Pg. 5 **Retirement Rates -** The probability of retirement at each age at which participants are eligible to retire.

Recommendation: Adjust the current retirement rates to those developed in Section III(B). Both General and Safety members are assumed to retire at slightly younger ages overall.

Ref: Pg. 14 **Mortality Rates -** The probability of dying at each age. Mortality rates are used to project life expectancies.

Recommendation: Decrease pre- and post-retirement mortality rates for non-disabled Safety members and non-disabled General female members and slightly increase mortality rates for non-disabled General male members as developed in Section III(C). Decrease mortality rates for disabled General members and increase mortality rates for disabled Safety members as developed in Section III(D).

Ref: Pg. 27 **Termination Rates** - The probability of leaving employment at each age and receiving either a refund of contributions or a deferred vested retirement benefit.

Recommendation: Increase the current termination rates for General members and decrease the rates for Safety members to those developed in Section III(E). We are also recommending small increases in the proportion of Safety members assumed to elect a refund of member contributions at termination.

Ref: Pg. 37 **Disability Incidence Rates** - The probability of becoming disabled at each age.

> ***Recommendation: Decrease the current disability rates overall for both General and Safety members to those developed in Section III(F).***

Ref: Pg. 42 **Individual Salary Increases -** Increases in the salary of a member between the date of the valuation to the date of separation from active service.

> ***Recommendation: Change the promotional and merit increases to those developed in Section III(G). Overall assumed salary increases are slightly lower for General members and slightly higher for Safety members under the new assumptions.***

We have estimated the impact of proposed assumption changes as if they were applied to the June 30, 2013 actuarial valuation. If all of the proposed demographic assumption changes were implemented, the average employer rate would have increased by 0.96% of compensation. The average member rate would have increased by 0.03% of compensation. Of the various demographic assumption changes, the most significant cost impact is from the mortality assumption change.

If all of the proposed economic assumptions (recommended in a separate report) were implemented (including the proposed change to an explicit administrative expense load), the average employer rate would have increased by 3.25% of compensation and the average member rate would have been increased by 0.20%. Of the various economic assumption changes, the most significant cost impact is from the investment return assumption change.

Therefore, the estimated cost impact of all proposed assumption changes (both demographic and economic) is 4.21% of compensation for the average employer rate, where the Normal Cost rate increased by 0.40%, the UAAL amortization rate increased by 3.00% and the explicit administrative expense load is 0.81%. The average member rate would have increased by 0.23% of compensation, including the explicit administrative load of 0.09%. The allocation of the explicit administrative expense load between employers and members is discussed in the economic assumptions report.

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

II. BACKGROUND AND METHODOLOGY

In this report, we analyzed the "demographic" or "non-economic" assumptions only. Our analysis of the "economic" assumptions for the June 30, 2014 valuation is provided in a separate report. Demographic assumptions include the probabilities of certain events occurring in the population of members, referred to as "decrements," e.g., termination from service, disability retirement, service retirement, and death after retirement. We also review the individual salary increases net of inflation (i.e., the promotional and merit assumptions) in this report.

Demographic Assumptions

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

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

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

III. ACTUARIAL ASSUMPTIONS

A.   ECONOMIC ASSUMPTIONS

The economic assumptions are currently reviewed every three years at the same time as the non-economic assumptions.   See the separate report titled "Review of Economic Actuarial Assumptions for the June 30, 2014 Actuarial Valuation".

B.   RETIREMENT RATES

The age at which a member retires from service (i.e., who did not retire on a disability pension) will affect both the amount of the benefits that will be paid to that member as well as the period over which funding must take place.

The table on the following page shows the observed service retirement rates for General Tier I members based on the actual experience over the past three years.   The observed service retirement rates were determined by comparing those members who actually retired from service to those eligible to retire from service.   This same methodology is followed throughout this report and was described in Section II.   Also shown are the current assumed rates and the rates we propose:

General Tier I

Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
Under 50	0.00%	57.89%	0.00%
50	6.00	7.66	6.00
51	6.00	5.34	6.00
52	6.00	6.33	6.00
53	6.00	7.67	6.00
54	7.00	10.19	8.00
55	9.00	14.04	11.00
56	11.00	12.10	12.00
57	13.00	18.66	15.00
58	16.00	16.31	16.00
59	18.00	19.88	19.00
60	22.00	25.61	23.00
61	25.00	24.14	25.00
62	30.00	29.79	30.00
63	30.00	26.71	30.00
64	30.00	25.60	30.00
65	30.00	29.79	30.00
66	40.00	49.23	40.00
67	40.00	33.33	40.00
68	40.00	36.36	40.00
69	40.00	57.14	40.00
70 & Over	100.00	24.39	100.00

As shown above, we recommend minor increases in the retirement rates at some ages for General Tier I members.

Chart 1 that follows later in this section compares actual experience with the current and proposed rates of retirement for General Tier I members.

The following table shows the observed retirement rates for Safety Tier I members over the past three years. Also shown are the current assumed rates and the rates we propose:

Safety Tier I

Age	Current Rate of Retirement	Actual Rate of Retirement	Proposed Rate of Retirement
Under 45	0.00%	3.28%	0.00%
45	1.00	5.88	2.00
46	1.00	2.04	2.00
47	1.00	1.64	2.00
48	1.00	3.45	2.00
49	6.00	12.36	8.00
50	16.00	30.63	20.00
51	14.00	20.00	16.00
52	16.00	20.73	18.00
53	18.00	16.88	18.00
54	20.00	22.22	20.00
55	22.00	28.81	24.00
56	25.00	34.55	28.00
57	27.00	26.32	28.00
58	30.00	40.63	35.00
59	25.00	16.67	20.00
60	25.00	16.67	20.00
61	25.00	15.79	20.00
62	100.00	33.33	50.00
63	100.00	20.00	50.00
64	100.00	37.50	50.00
65 & Over	100.00	50.00	100.00

We recommend increases in the retirement rates at most ages before 58 and decreases in the retirement rates at most ages after 58 for Safety members. We are increasing the age at which 100% retirement is assumed from age 62 to age 65.

Chart 2 compares actual experience with the current and proposed rates for Safety members.

There is not enough General Tier II, General Tier III or Safety Tier II experience to perform a statistically meaningful study. Accordingly, we have based our recommended rates for General Tier II, General Tier III and Safety Tier II on a combination of the current assumptions for these tiers and the actual retirement experience for Tier I members.

The following table shows the current assumed rates and the rates we proposed for General Tier II and General Tier III members:

	General Tiers IIA and IIB		General Tier III	
Age	Current Rate of Retirement	Proposed Rate of Retirement	Current Rate of Retirement	Proposed Rate of Retirement
Under 50	0.00%	0.00%	0.00%	0.00%
50	3.00	3.00	0.00	0.00
51	3.00	3.00	0.00	0.00
52	3.00	3.00	3.00	3.00
53	3.00	3.00	3.00	3.00
54	3.00	3.50	3.00	3.50
55	5.00	6.00	5.00	6.00
56	6.00	6.50	6.00	6.50
57	7.00	8.00	7.00	8.00
58	10.00	10.00	10.00	10.00
59	11.00	11.50	11.00	11.50
60	13.00	13.50	13.00	13.50
61	17.00	17.00	17.00	17.00
62	30.00	30.00	30.00	30.00
63	30.00	30.00	30.00	30.00
64	30.00	30.00	30.00	30.00
65	30.00	30.00	30.00	30.00
66	40.00	40.00	40.00	40.00
67	40.00	40.00	40.00	40.00
68	40.00	40.00	40.00	40.00
69	40.00	40.00	40.00	40.00
70 & Over	100.00	100.00	100.00	100.00

The following table shows the current assumed rates and the rates that we propose for Safety Tier II.

Safety Tier IIA and IIB		
Age	Current Rate of Retirement	Proposed Rate of Retirement
Under 50	0.00%	0.00%
50	5.00	6.00
51	5.00	6.00
52	5.00	6.00
53	8.00	8.00
54	18.00	18.00
55	20.00	22.00
56	20.00	22.00
57	20.00	22.00
58	20.00	22.00
59	25.00	20.00
60	25.00	20.00
61	25.00	20.00
62	50.00	50.00
63	50.00	50.00
64	50.00	50.00
65	100.00	100.00
66	100.00	100.00
67	100.00	100.00
68	100.00	100.00
69	100.00	100.00
70 & Over	100.00	100.00

Segal Consulting

<u>Deferred Vested Members</u>

In prior valuations, deferred vested General and Safety members were assumed to retire at age 57 and 53, respectively. The average age at retirement over the prior three years was 57 for General members and 53 for Safety members. We recommend maintaining the General assumption of age 57 and the Safety assumption of age 53.

<u>Reciprocity</u>

It was also assumed that 55% of inactive General and 60% of inactive Safety deferred vested members would be covered under a reciprocal retirement system and receive a 4.75% annual salary increase from termination until their date of retirement. During the last three years, actual experience shows that 13% of General members and 43% of Safety members went on to be covered by a reciprocal retirement system. We recommend maintaining a 55% reciprocal assumption for General members and a 60% reciprocal assumption for Safety members. This recommendation takes into account the experience of all deferred vested members as of June 30, 2013 instead of just new deferred vested members during the three-year period. This is because there is a lag between a member's date of termination and the time that it is known if they have reciprocity with a reciprocal retirement system.

Based on our recommended salary increase assumptions, we propose that the current 4.75% annual salary increase assumption be decreased to 4.25% to anticipate salary increases from the date of termination from KCERA to the expected date of retirement.

<u>Survivor Continuance Under Unmodified Option</u>

In prior valuations, it was assumed that 75% of all active male members and 55% of all active female members would be married or have an eligible domestic partner when they retired. We reviewed new retirees during the three-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
2011	75%	56%
2012	69%	53%
2013	66%	50%
Total	71%	54%

According to experience of members who retired during the last three years, about 71% of all male members and 54% of all female members were married or had a domestic partner at retirement. We recommend maintaining the assumption at 75% for male members and maintaining the assumption at 55% for female members.

Since the value of the survivor's benefit is dependent on the survivor's age and sex, we must also have assumptions for the age and sex of the survivor. Based on the experience during the three-year period and studies done for other retirement systems, we believe that it is reasonable to continue to assume a three-year age difference for the survivor's age as compared to the member's age.

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

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

Survivor Ages – Current Assumptions

| | Survivor's Age as Compared to Member's Age | |
Beneficiary Sex	Current Assumption	Recommended Assumption
Male	3 years older	No change
Female	3 years younger	No change

Chart 1
Retirement Rates - General Tier I Members
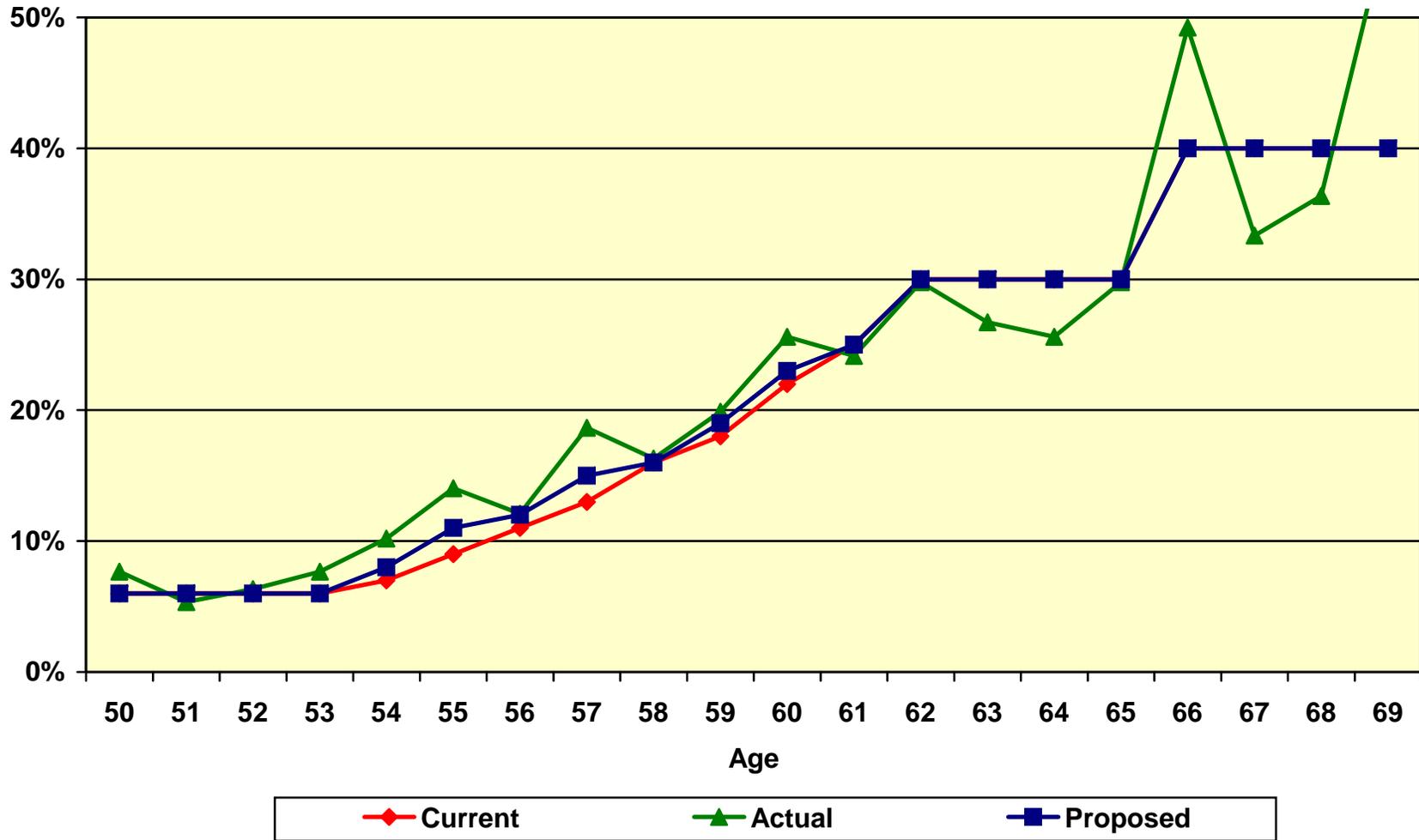
**Chart 2
Retirement Rates - Safety Tier I Members**

Legend: Current, Actual, Proposed

Segal Consulting
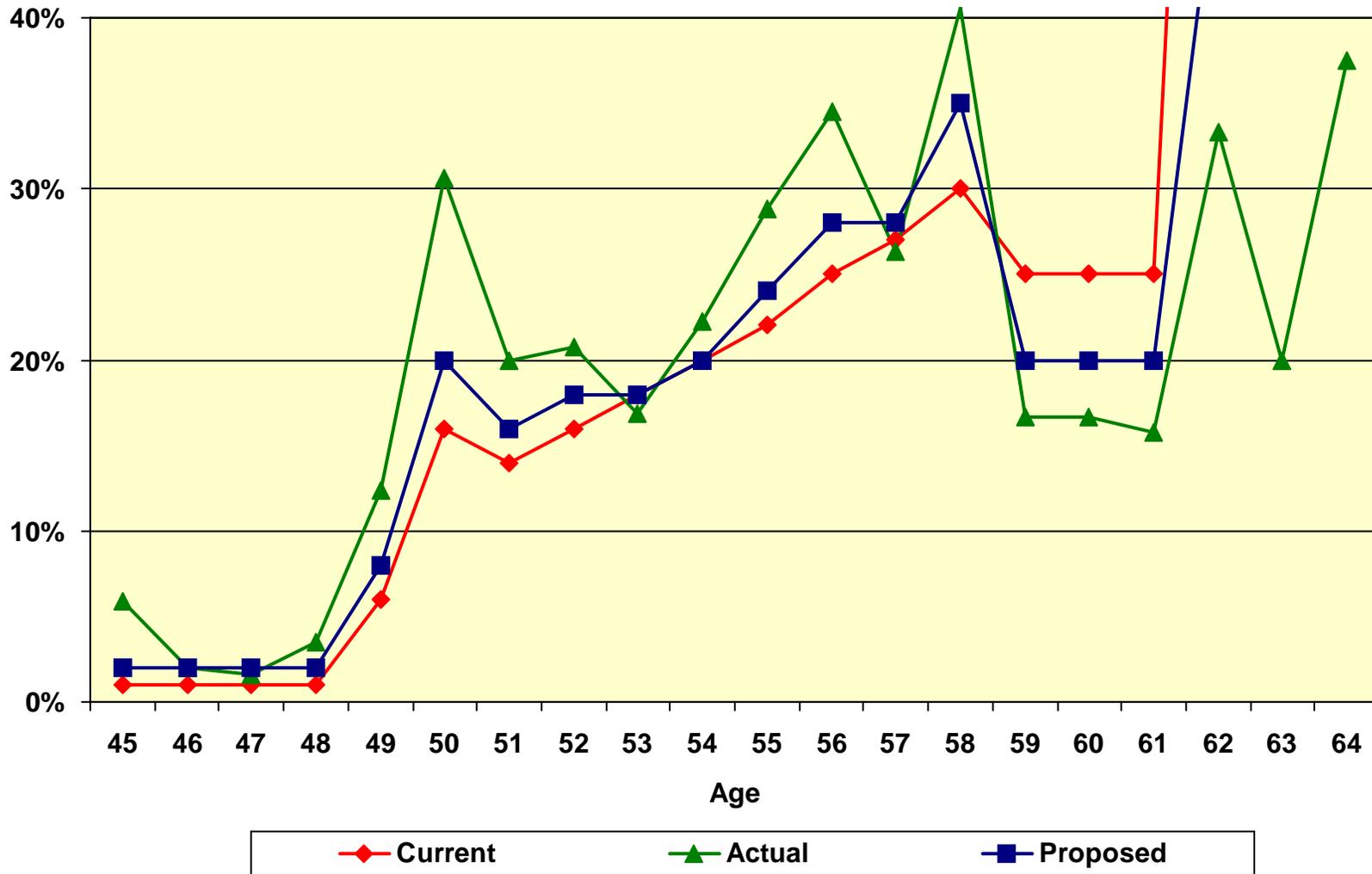
C. MORTALITY RATES - HEALTHY

The "healthy" mortality rates project what proportion of members will die before retirement as well as the life expectancy of a member who retires from service (i.e., who did not retire on a disability pension). The table currently being used for both General and Safety post-service retirement mortality rates is the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) with ages set back two years for males and one year for females. Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who has taken a service (non-disability) retirement.

Recent changes to ASOP 35 have increased the actuary's responsibility to consider and to disclose an allowance for future mortality improvement in this assumption. Ways to reflect anticipated future mortality improvement include:

➤ Mortality of a longer-lived group – The table in use, without projection, forecasts fewer deaths than the current experience level, thus implicitly allowing for future mortality improvement.

➤ Projection to a future year – The same mortality table is used for all members, but that table is intended to be reflective of mortality at a future date, not as of today.

➤ Generational mortality – Each year of birth has its own mortality table that reflects the forecasted improvements. Thus, younger participants have more future mortality improvement built in than older participants do.

Historically, we have used the approach described in the first bullet when setting mortality assumptions for KCERA. Generally, we have set the mortality assumption so that actual deaths will be at least 10% greater than those assumed.

Pre-Retirement Mortality

The number of deaths among active and deferred vested members is not large enough to provide a statistically credible basis for a specific pre-retirement mortality analysis. Therefore, we continue to propose that pre-retirement mortality follow the same tables used for post-retirement mortality. We recommend maintaining the current assumptions that all pre-retirement deaths are assumed to be ordinary (non-service connected) and will continue to monitor in future studies.

<u>Post-Retirement Mortality (Service Retirements)</u>

Our analysis starts with a table that shows among all service retired members, the actual deaths compared to the expected deaths under the current assumptions for the last three years. We also show the deaths under proposed assumptions based on using a methodology generally consistent with prior years. As noted above, in prior years we have generally set the mortality assumption so that actual deaths will be at least 10% greater than those assumed. We are recommending continuation of that methodology in this experience study, with a change in that we recommend applying a projection to a future year in combination with using the mortality of a longer-lived group. However, as discussed later in this section, the Board should be aware that a future recommendation may include the use of a generational mortality table.

	General – Healthy			Safety – Healthy		
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	109	124	110	41	39	34
Female	<u>164</u>	<u>177</u>	<u>156</u>	<u>3</u>	<u>1</u>	<u>2</u>
Total	273	301	266	44	40	36
Actual / Expected	110%		113%	91%		111%

Chart 3 compares actual to expected deaths for General members under the current and proposed assumptions over the last three years. Experience shows that there were more deaths than predicted by the current table.

Chart 4 has the same comparison for Safety members. Experience shows that there were fewer deaths than predicted by the current table.

For General service retirees the ratio of actual to expected deaths was 110%. We recommend changing the current table to the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) projected with Scale BB to 2023 with ages set forward one year for males and females. This will bring the actual to expected ratio to 113%. This is consistent with ASOP 35 as we are continuing to include about a 10% margin in the rates to anticipate expected future improvement in life expectancy.

For Safety service retirees the ratio of actual to expected deaths was 91%. We recommend changing the current table to the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) projected with Scale BB to 2023 with ages set back one year for males and females. This will bring the actual to expected ratio to 111%.

Chart 5 shows the life expectancies (i.e. expected future lifetime) under the current and the proposed tables for General members.

Chart 6 shows the same information for Safety members.

As mentioned earlier, we want to make the Board aware that a future recommendation might be for the use of a generational mortality table. While the use of generational mortality tables is under considerable discussion as an emerging practice within the actuarial profession, to date it is still uncommon for public sector retirement plans to actually use a generational mortality table. However, we anticipate that actuarial practice will continue to move in this direction, for reasons we will now discuss.

A generational mortality table provides dynamic projections of mortality experience for each cohort of retirees. For example, the mortality rate for someone who is 65 next year will be slightly less than for someone who is 65 this year. In general, using generational mortality anticipates increases in the cost of the Plan over time as participants' life expectancies are projected to increase. This is in contrast to updating a static mortality assumption with each experience study as we have proposed in this and prior experience studies.

Using generational mortality rather than static mortality incorporates a more explicit assumption for future mortality improvement. Accordingly, the goal is to start with a mortality table that closely matches the current experience (without a margin for future mortality improvement), and then reflect mortality improvement by projecting lower mortality rates in future years. That is why, for an illustrative generational mortality table that we developed for the Plan, the current actual to expected ratio shown in the tables below is only around 100%. In future years these ratios would remain around 100%, as long as actual mortality improved at the same rates as anticipated in the generational mortality tables.

	General – Healthy			Safety – Healthy		
	Expected Deaths	Actual Deaths	Proposed Expected Deaths*	Expected Deaths	Actual Deaths	Proposed Expected Deaths**
Male	109	124	127	41	39	39
Female	164	177	176	3	1	2
Total	273	301	303	44	40	41
Actual / Expected	110%		99%	91%		98%

*   *For illustration purposes only and shown for the RP-2000 Combined Healthy Mortality Table projected to 2012 (middle year of the experience study period) with Scale BB, with ages set forward one year for males and females.*

** *For illustration purposes only and shown for the RP-2000 Combined Healthy Mortality Table projected to 2012 (middle year of the experience study period) with Scale BB, with ages set back one year for males and females.*

★ Segal Consulting

Note that using generational mortality increases current liabilities and costs more than using static mortality but should result in fewer changes (and cost increases) in later years. For example, the generational mortality table developed above would increase the total (employer and employee) contribution rate by about 2% of compensation more than the updated static table that we are recommending.[1]

Note that there are currently unresolved issues regarding how generational mortality tables would be used in determining member contribution rates, optional forms of payments and reserve values. These issues would need to be addressed for KCERA before using a generational mortality table.

<u>Mortality Table for Member Contributions</u>

We recommend that the mortality table used for determining contributions for General members be updated from the RP-2000 Combined Healthy Mortality Table set back two years for males and one year for females weighted 30% male and 70% female to the RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set forward one year for males and females weighted 30% male and 70% female. This is based on the proposed valuation mortality table for General members and the actual sex distribution of General members.

For Safety members, we recommend the mortality table be changed from the RP-2000 Combined Healthy Mortality Table set back two years for males and one year for females weighted 80% male and 20% female to the RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set back one year for males and females weighted 80% male and 20% female. This is based on the proposed valuation mortality table for Safety members and the actual sex distribution of Safety members.

---

[1] These cost increases reflect the hypothetical adoption of generational mortality for both healthy and disabled retirees.

Chart 3
Post - Retirement Deaths
Non - Disabled General Members

Year ended June 30,

Legend: Expected - Current | Actual | Expected - Proposed

Segal Consulting

-18-
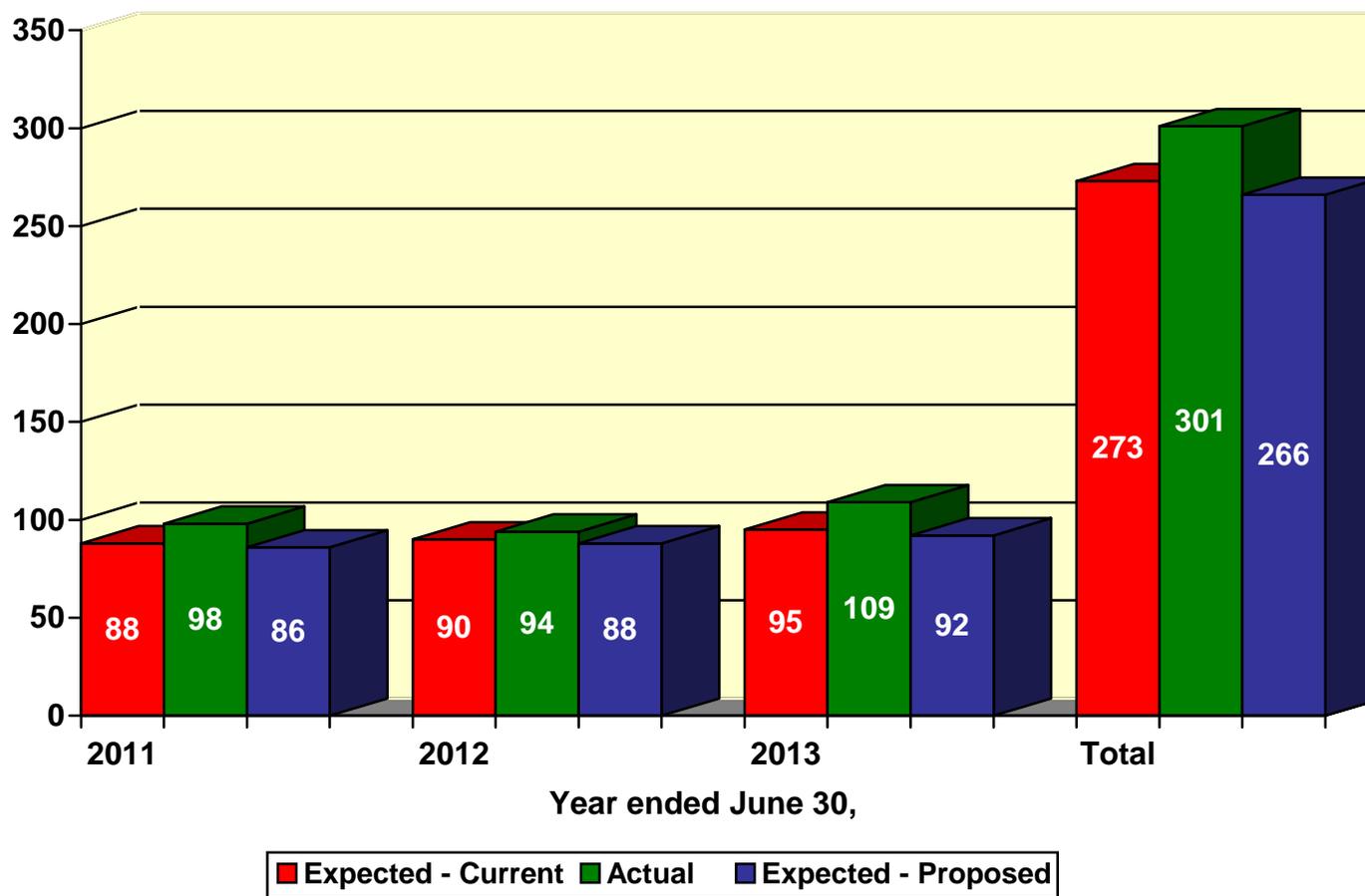
Chart 4
Post - Retirement Deaths
Non - Disabled Safety Members

Year ended June 30,

Legend: ■ Expected - Current ■ Actual ■ Expected - Proposed

Year ended June 30	Expected - Current	Actual	Expected - Proposed
2011	14	17	12
2012	15	13	12
2013	15	10	12
Total	44	40	36
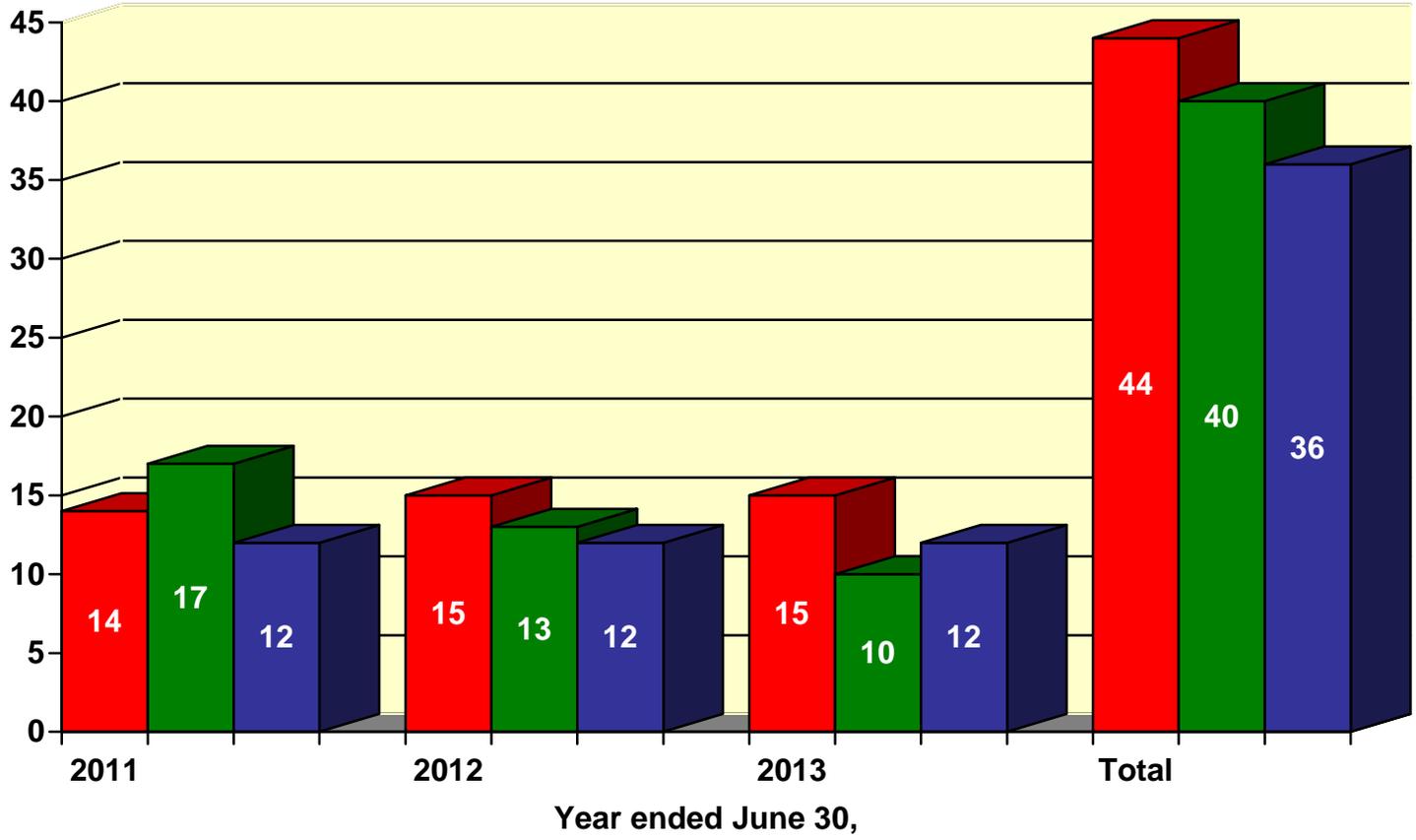
Chart 5
Life Expectancies
Non - Disabled General Members

Segal Consulting
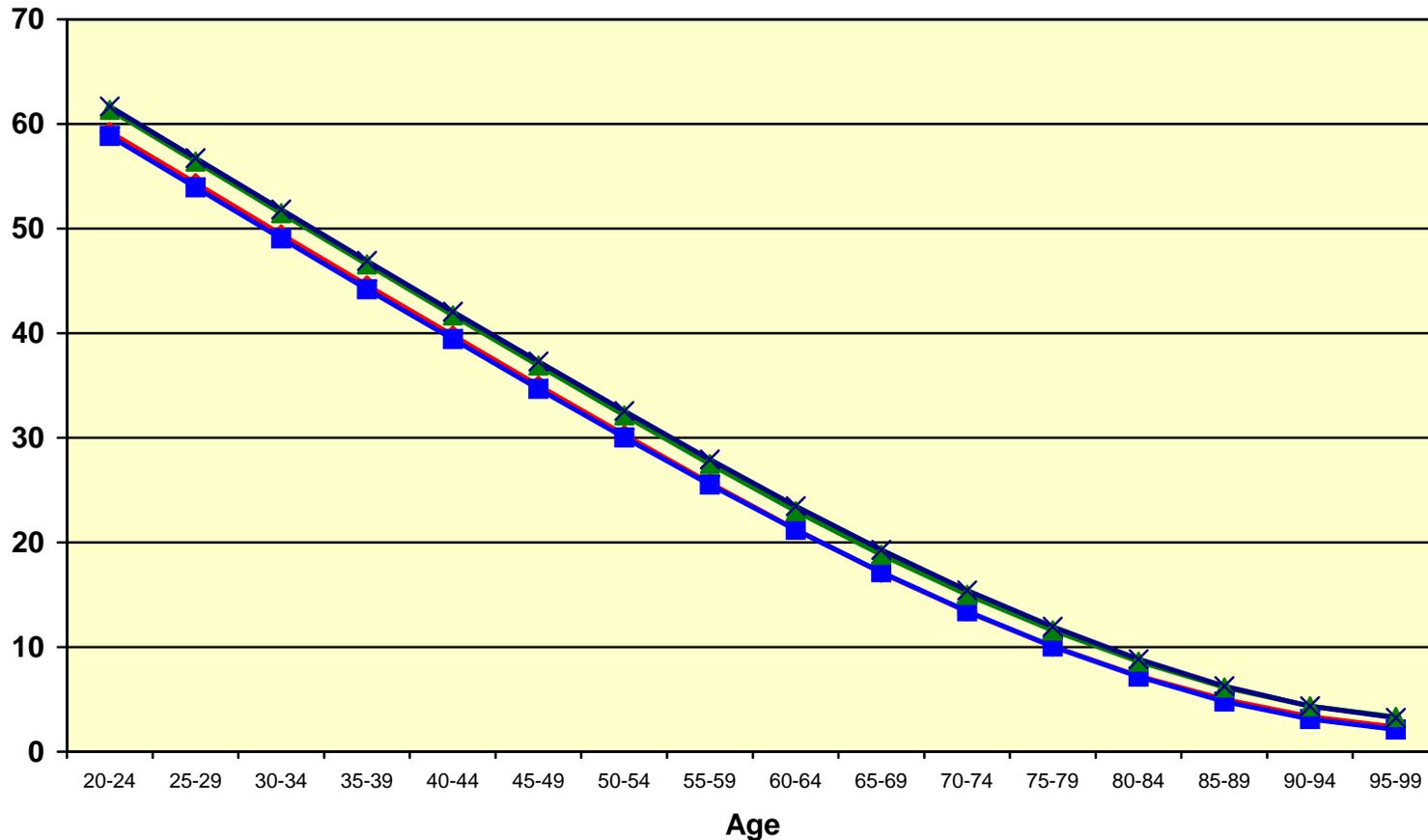
Chart 6
Life Expectancies
Non - Disabled Safety Members

Segal Consulting
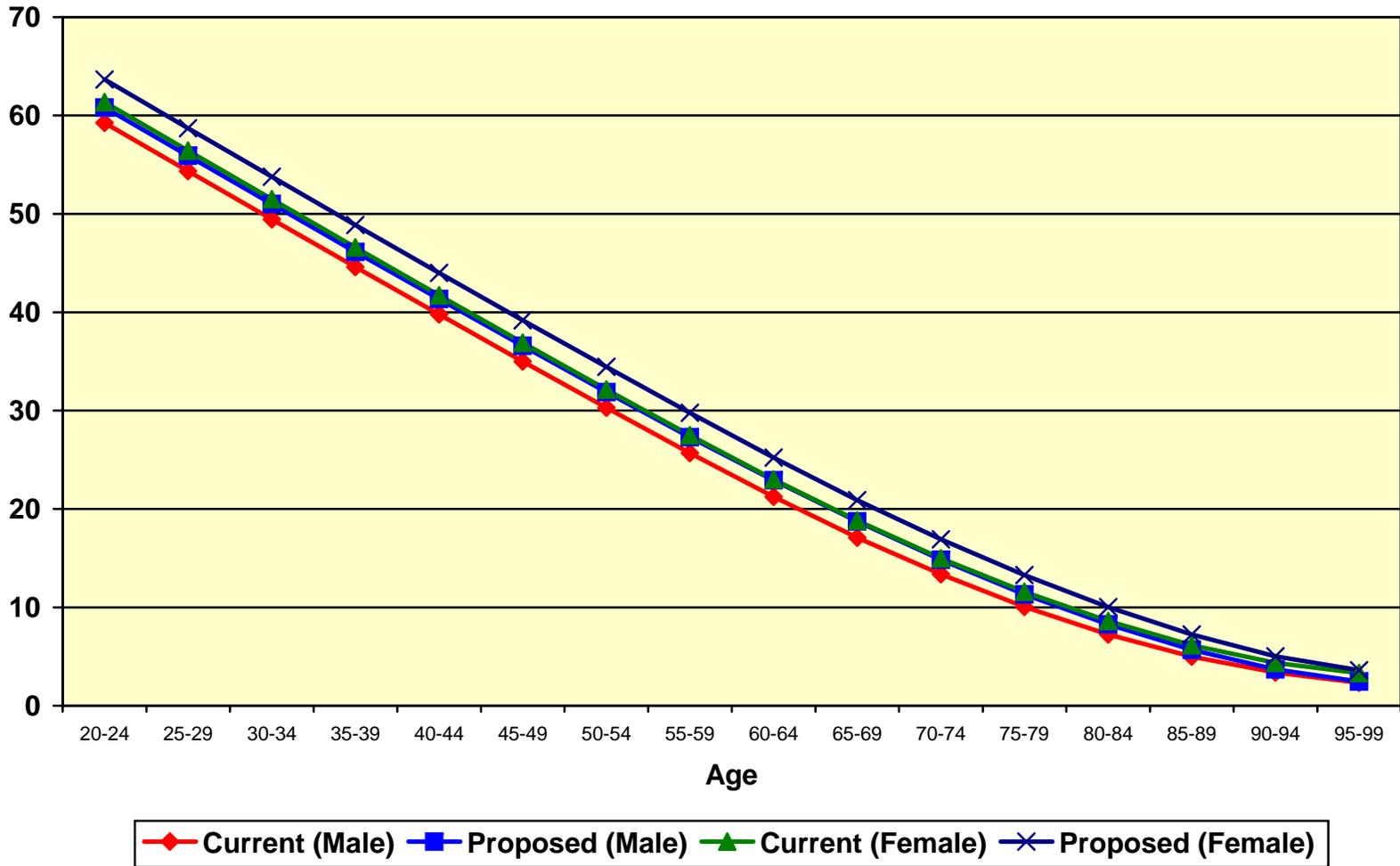
D. MORTALITY RATES - DISABLED

Since death rates for disabled members can vary from those of healthy members, a different mortality assumption is often used. For General members, the table currently being used is the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) with ages set forward six years for males and females. For Safety members, the table currently being used is the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) with ages set forward one year for males and females.

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

	General – Disabled			Safety – Disabled		
	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	22	21	20	21	24	22
Female	21	22	20	1	2	1
Total	43	43	40	22	26	23
Actual / Expected	100%		108%	118%		113%

Based on this experience, we recommend that the mortality table for General members be changed to the RP-2000 Combined Healthy Mortality Table (separate tables for males and females) projected with Scale BB to 2023 with ages set forward eight years. We recommend that the mortality table for Safety members be changed to the RP-2000 Combined Table (separate tables for males and females) projected with Scale BB to 2023 with ages set forward four years.

Chart 7 compares actual to expected deaths under both the current and proposed assumptions for disabled General members over the last three years. Experience shows that the number of deaths was equal to the number predicted by the current table. Our recommendation incorporates a margin for future mortality improvement.

Chart 8 has the same comparison for Safety members. Experience shows that there were more deaths than predicted by the current table. Our recommendation still incorporates a sufficient margin for future mortality improvement.

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

Chart 10 shows the same information for Safety members.

✴ Segal Consulting

Chart 7
Post - Retirement Deaths
Disabled General Members

Year ended June 30,

■ Expected - Current   ■ Actual   ■ Expected - Proposed
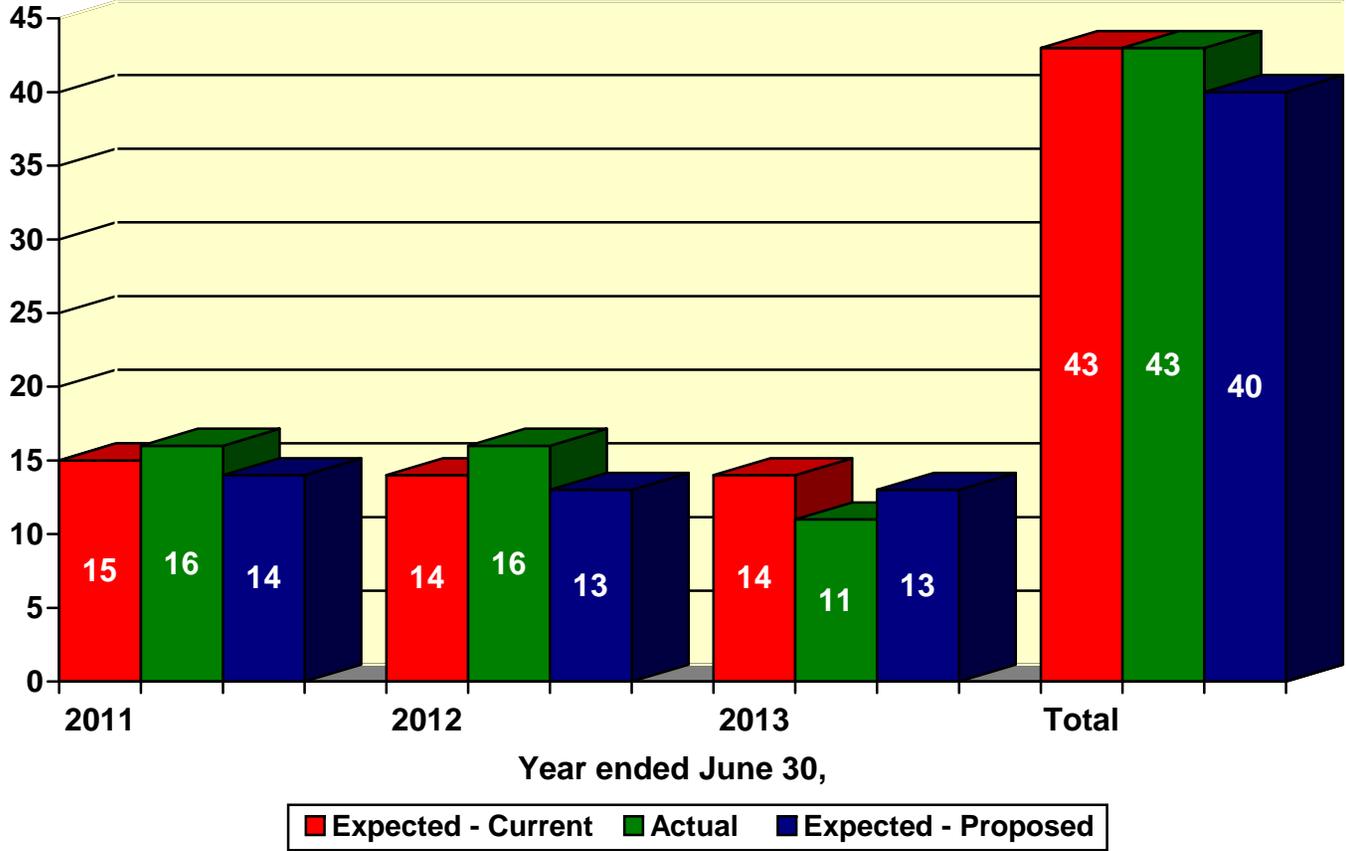
Chart 8
Post - Retirement Deaths
Disabled Safety Members

Year ended June 30,

Legend: Expected - Current ■ Actual ■ Expected - Proposed

Segal Consulting
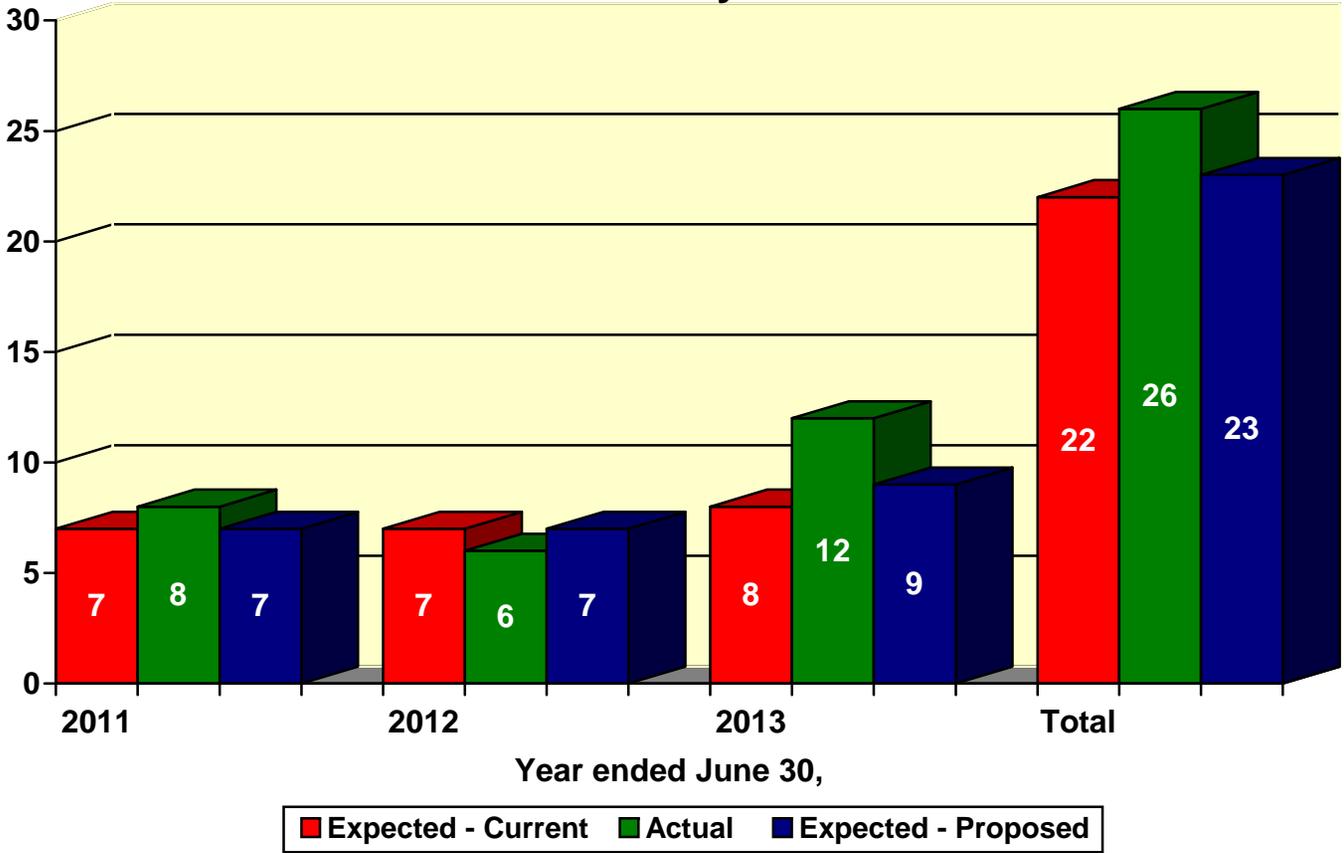
Chart 9
Life Expectancies
Disabled General Members

Segal Consulting
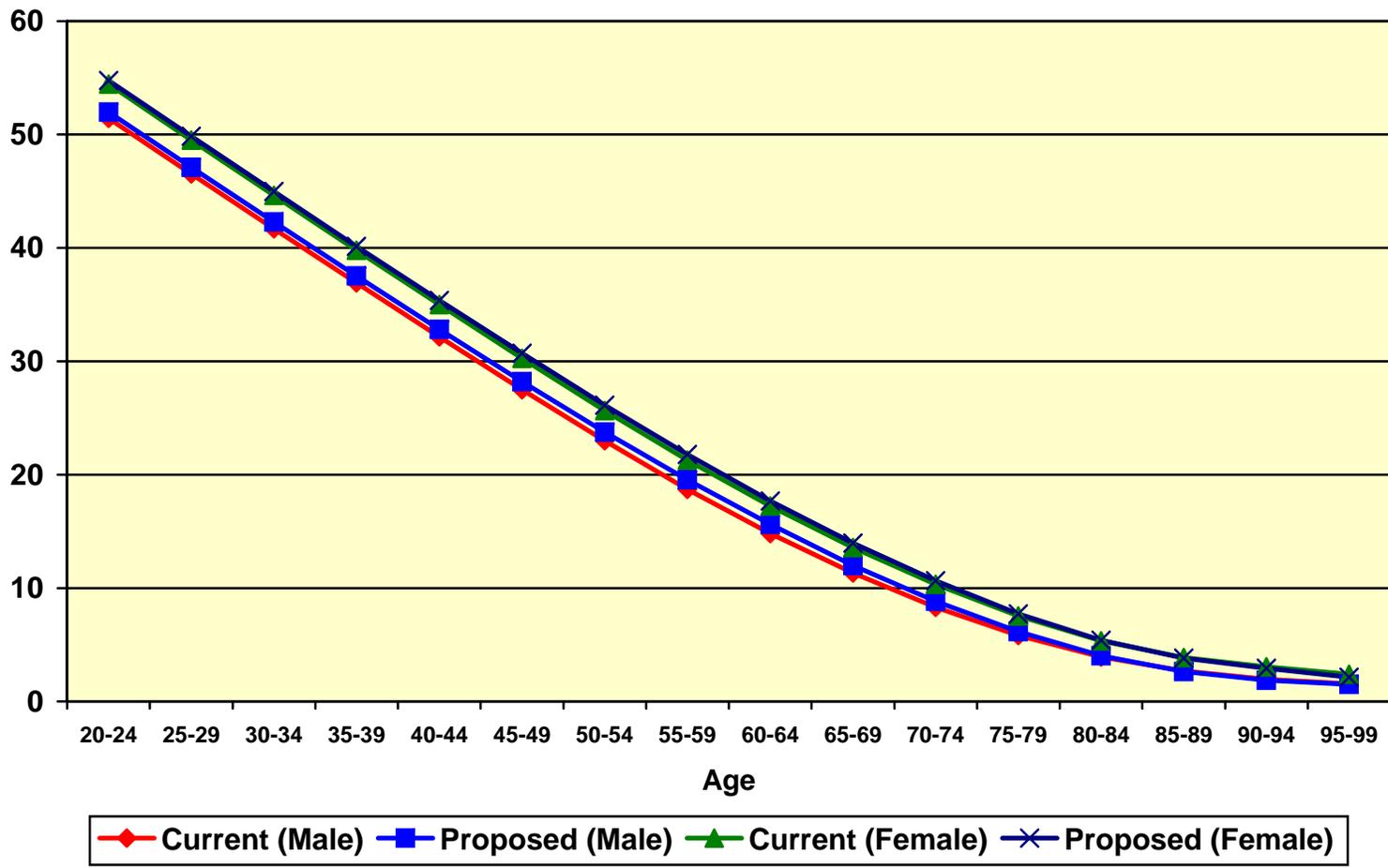
Chart 10
Life Expectancies
Disabled Safety Members

Legend: Current (Male), Proposed (Male), Current (Female), Proposed (Female)

X-axis: Age (20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90-94, 95-99)
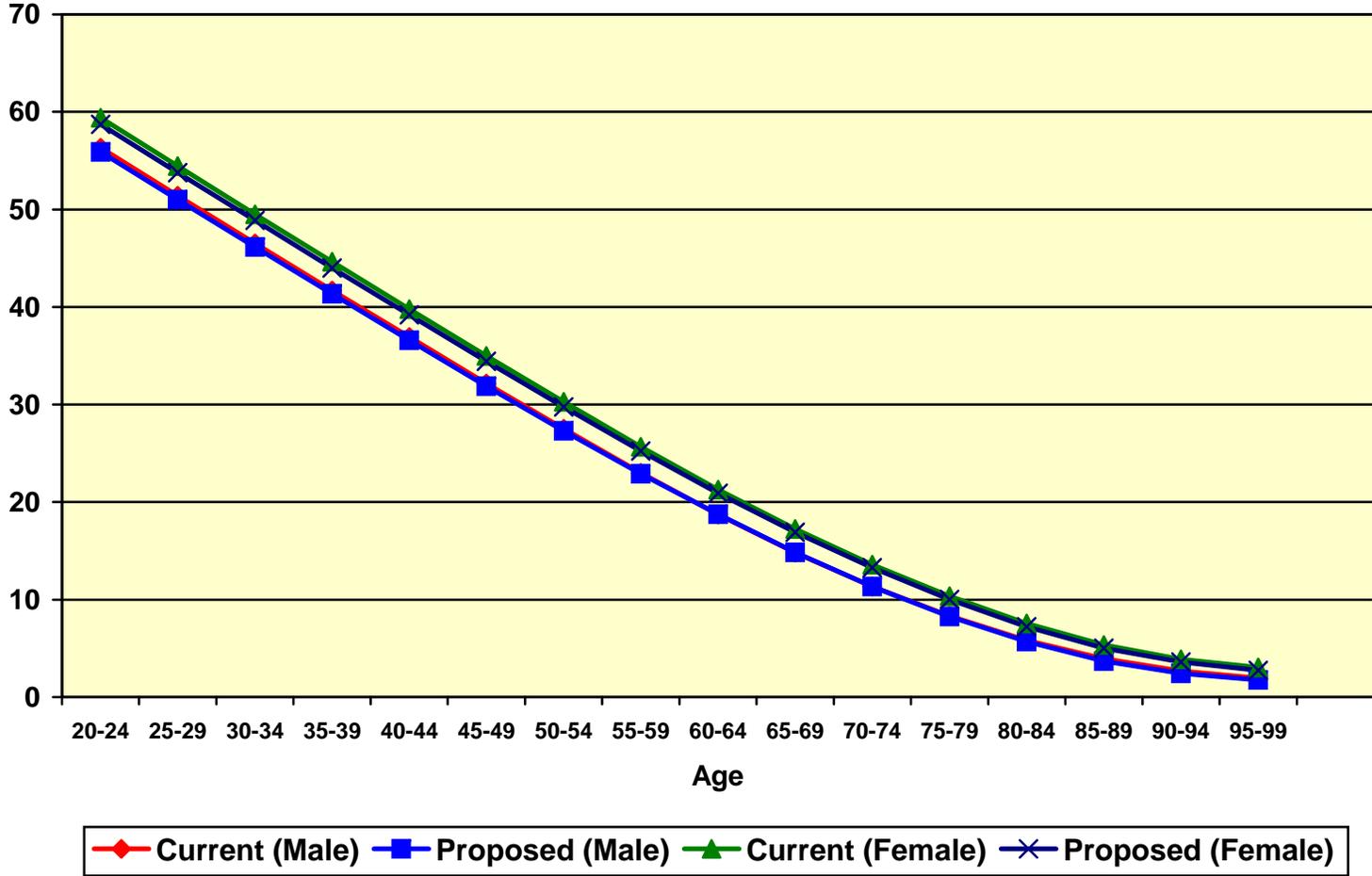
E. TERMINATION RATES

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current assumptions there is an overall incidence of termination assumed, combined with a service-based assumption that a percentage of all terminated vested members will choose a refund of contributions. All terminated nonvested members are assumed to choose a refund of contributions. With this study, we continue to recommend that this same assumption structure be used. The termination experience over the last three years for General and Safety members is as follows:

Rates of Termination (General)

Years of Service	Current Rate	Observed Rate	Proposed Rate
0	18.00%	18.56%	18.00%
1	13.00	14.97	14.00
2	10.00	9.64	10.00
3	7.50	8.46	8.00
4	6.50	6.41	6.50
5	6.00	5.85	6.00
6	5.00	4.27	5.00
7	4.00	5.16	4.50
8	3.75	5.07	4.00
9	3.50	3.45	3.50
10	3.25	3.17	3.25
11	3.00	2.58	3.00
12	2.80	1.96	2.80
13	2.60	3.21	2.60
14	2.40	1.56	2.40
15	2.30	1.69	2.30
16	2.20	1.69	2.20
17	2.10	0.68	2.10
18	1.90	0.77	1.90
19	1.70	1.53	1.70
20	1.50	2.84	1.50
21	1.30	0.88	1.30
22	1.10	0.00	1.10
23	1.00	3.23	1.00
24	1.00	0.00	1.00
25	1.00	1.75	1.00
26	1.00	0.00	1.00
27	1.00	0.00	1.00
28	1.00	0.00	1.00
29	1.00	0.00	1.00
30 & Over	0.00	0.00	0.00

Segal Consulting

Rates of Termination (Safety)

Years of Service	Current Rate	Observed Rate	Proposed Rate
0	9.00%	7.34%	8.00%
1	7.00	3.31	5.00
2	4.00	2.88	3.50
3	3.00	3.35	3.25
4	3.00	2.93	3.00
5	2.50	2.82	2.60
6	2.40	1.69	2.30
7	2.30	2.31	2.20
8	2.20	1.33	2.10
9	2.10	1.18	2.05
10	2.00	2.30	2.00
11	1.90	1.21	1.90
12	1.70	0.88	1.70
13	1.50	1.56	1.50
14	1.30	0.64	1.30
15	1.10	1.92	1.10
16	0.90	1.39	0.90
17	0.75	1.89	0.75
18	0.75	4.00	0.75
19	0.75	0.00	0.75
20 & Over	0.00	0.00	0.00

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 at the highest service categories since most members in those categories are eligible to retire and so have been excluded from our review of this experience. This is also the case in the tables that follow due to the even more limited experience regarding actual terminations.

The next tables show the refund election experience over the last three years for General and Safety members.

Segal Consulting

Rates of Electing a Refund of Contributions upon Termination (General)

Years of Service	Years of Service	Years of Service	Years of Service
5	50.00%	57.14%	50.00%
6	47.00	43.59	47.00
7	44.00	54.29	44.00
8	41.00	40.54	41.00
9	38.00	64.00	38.00
10	35.00	38.89	35.00
11	32.00	7.69	32.00
12	30.00	14.29	30.00
13	28.00	44.44	28.00
14	26.00	0.00	26.00
15	24.00	66.67	24.00
16	22.00	0.00	22.00
17	20.00	100.00	20.00
18	18.00	0.00	18.00
19	16.00	50.00	16.00
20	14.00	25.00	14.00
21	12.00	0.00	12.00
22	10.00	0.00	10.00
23	8.00	50.00	8.00
24	6.00	0.00	6.00
25	4.00	100.00	4.00
26	2.00	0.00	2.00
27 & Over	0.00	0.00	0.00

Rates of Electing a Refund of Contributions upon Termination (Safety)

Years of Service	Current Rate	Observed Rate	Proposed Rate
5	50.00%	77.78%	60.00%
6	46.00	25.00	46.00
7	42.00	60.00	44.00
8	38.00	33.33	36.00
9	34.00	100.00	34.00
10	30.00	50.00	32.00
11	27.00	33.33	27.00
12	24.00	0.00	24.00
13	21.00	66.67	21.00
14	18.00	100.00	18.00
15	15.00	50.00	15.00
16	12.00	0.00	12.00
17	9.00	0.00	9.00
18	7.00	100.00	7.00
19	5.00	0.00	5.00
20 & Over	0.00	0.00	0.00

Segal Consulting

Chart 11 compares actual to expected terminations over the past three years for both the current and proposed assumptions for General members.

Chart 12 graphs the same information as Chart 11, but for Safety members.

Chart 13 shows the actual termination rates compared to the current and proposed assumptions for General members.

Chart 14 shows the same information as Chart 13, but for Safety members.

Chart 15 shows the actual rates of electing a refund of contributions compared to the current and proposed assumptions for General members.

Chart 16 shows the same information as Chart 15, but for Safety members.

Based upon the recent experience, we propose changes to the termination rates for both General and Safety members to better reflect the recent experience. Overall, for General members, the proposed termination rates are slightly higher than those under the current assumptions. For Safety members, the proposed termination rates are slightly lower overall than those under the current assumptions.

For General members, the proposed rates of electing a refund of contributions are the same as those under the current assumptions. For Safety members, the proposed rates of electing a refund of contributions are slightly higher overall than under the current assumptions reflecting some of the experience of the past three years.

We will also continue to assume that termination rates are zero at any age where members are assumed to retire. In other words, at those ages, members will retire in accordance with the retirement rate assumptions rather than terminate and defer their benefit.

Chart 11
Actual Number of Terminations Compared to Expected - General Members

Legend: Expected - Current | Actual | Expected - Proposed

Year ended June 30,	Expected - Current	Actual	Expected - Proposed
2011	340	319	347
2012	302	313	309
2013	326	368	333
Total	968	1000	989

Year ended June 30,

Segal Consulting

-31-
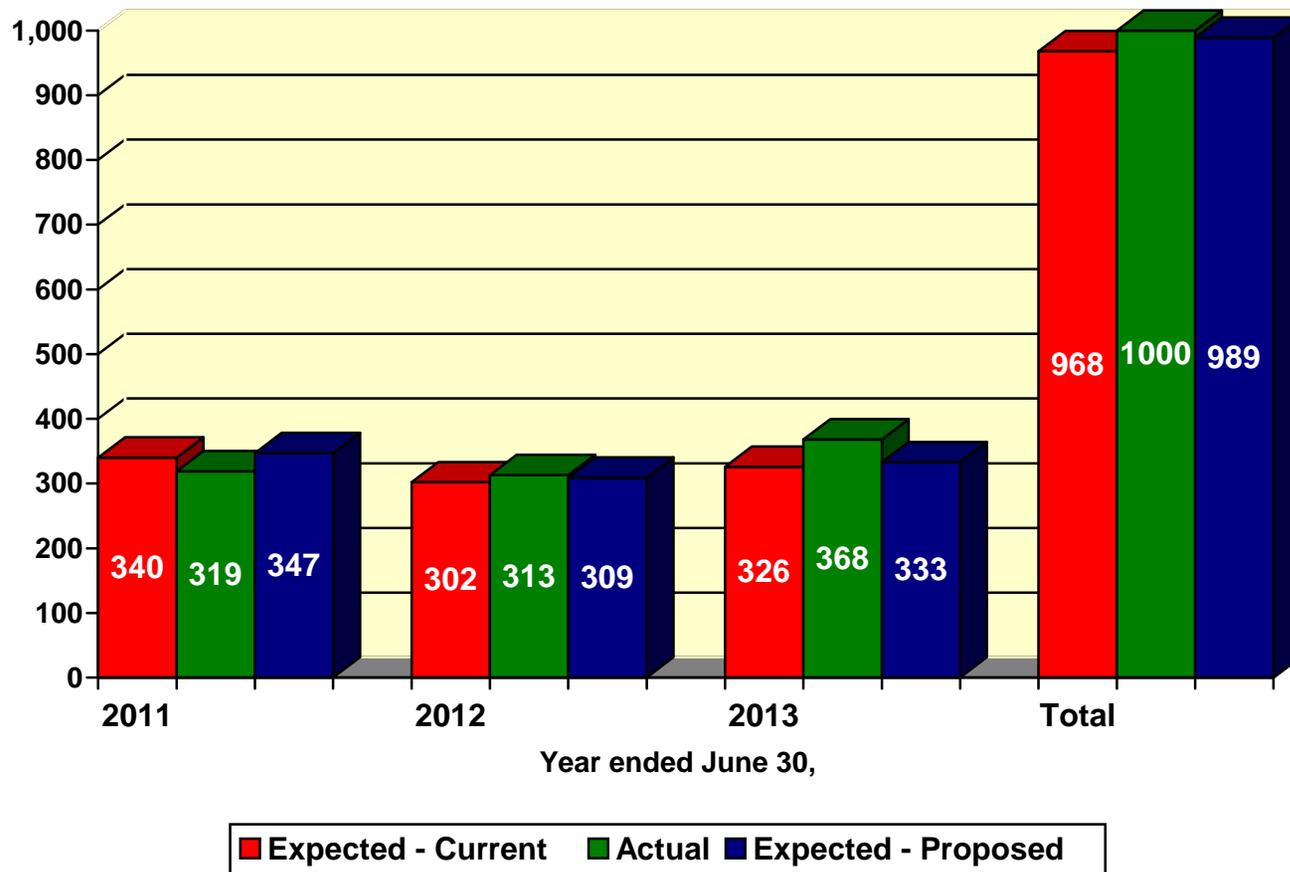
Chart 12
Actual Number of Terminations Compared to Expected - Safety Members

Year ended June 30,

Legend: Expected - Current ■ Actual ■ Expected - Proposed

Year	Expected - Current	Actual	Expected - Proposed
2011	40	34	38
2012	35	30	33
2013	44	37	41
Total	119	101	112

Segal Consulting
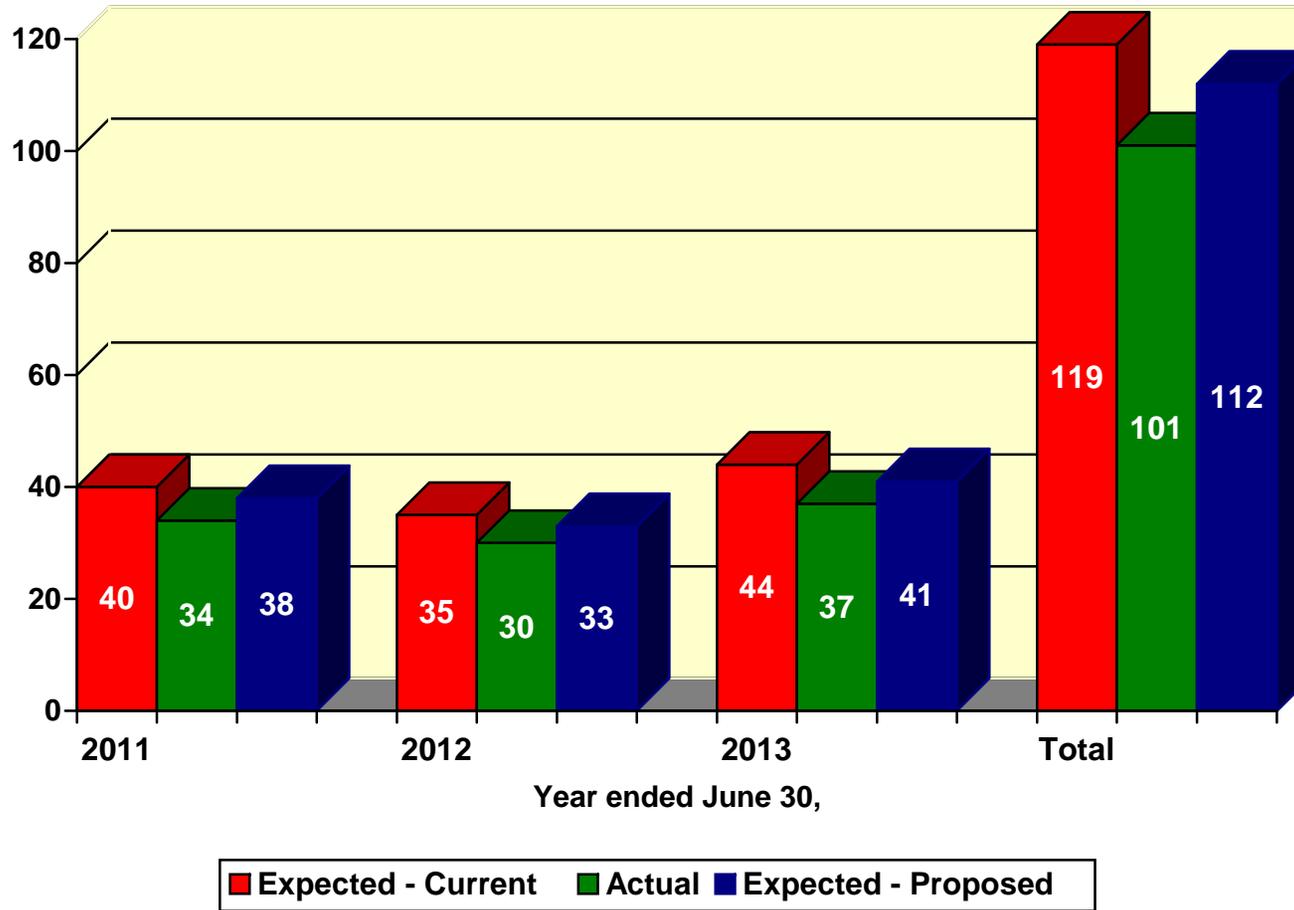
Chart 13
Termination Rates - General Members
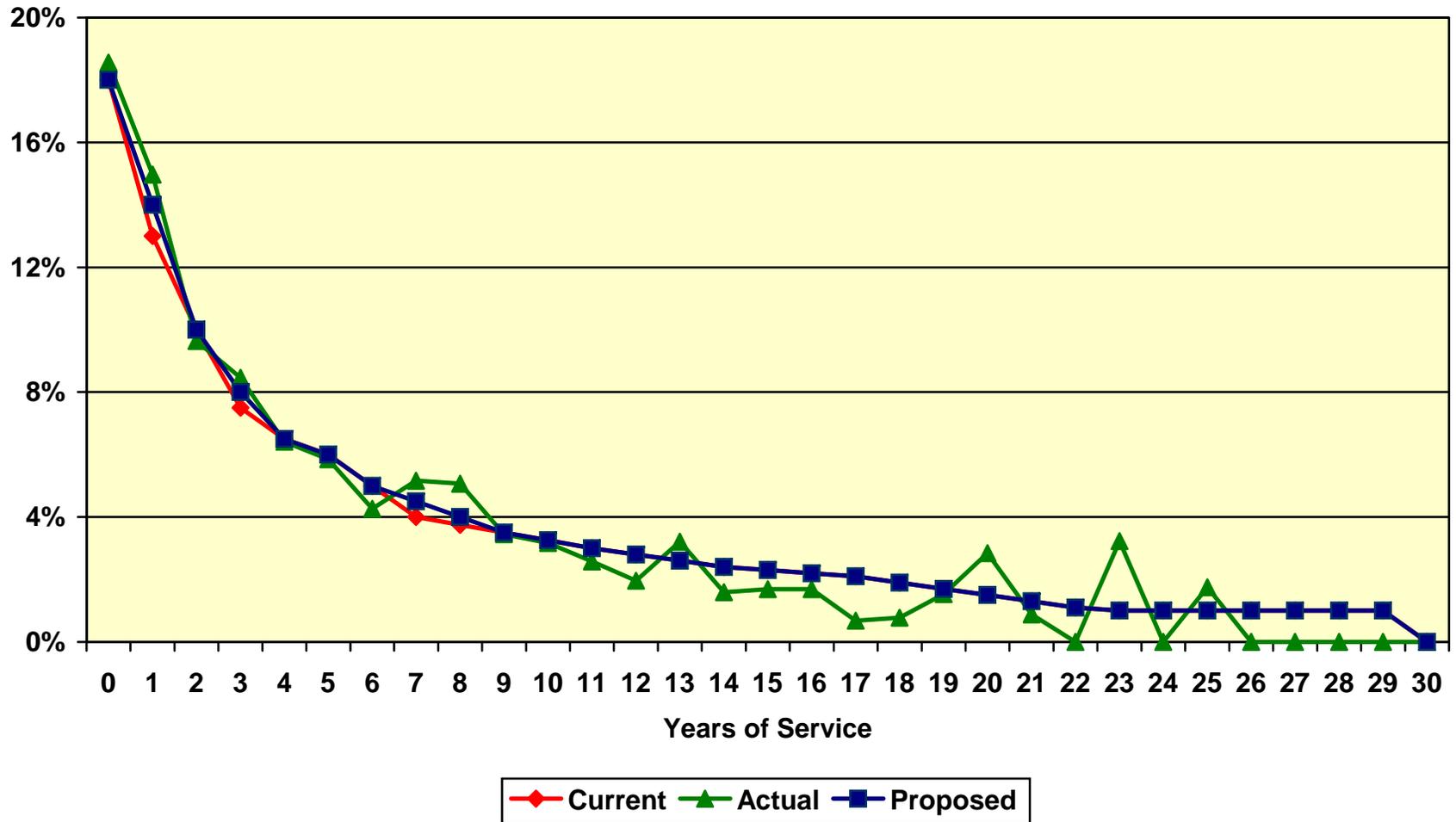
Chart 14
Termination Rates - Safety Members

Segal Consulting
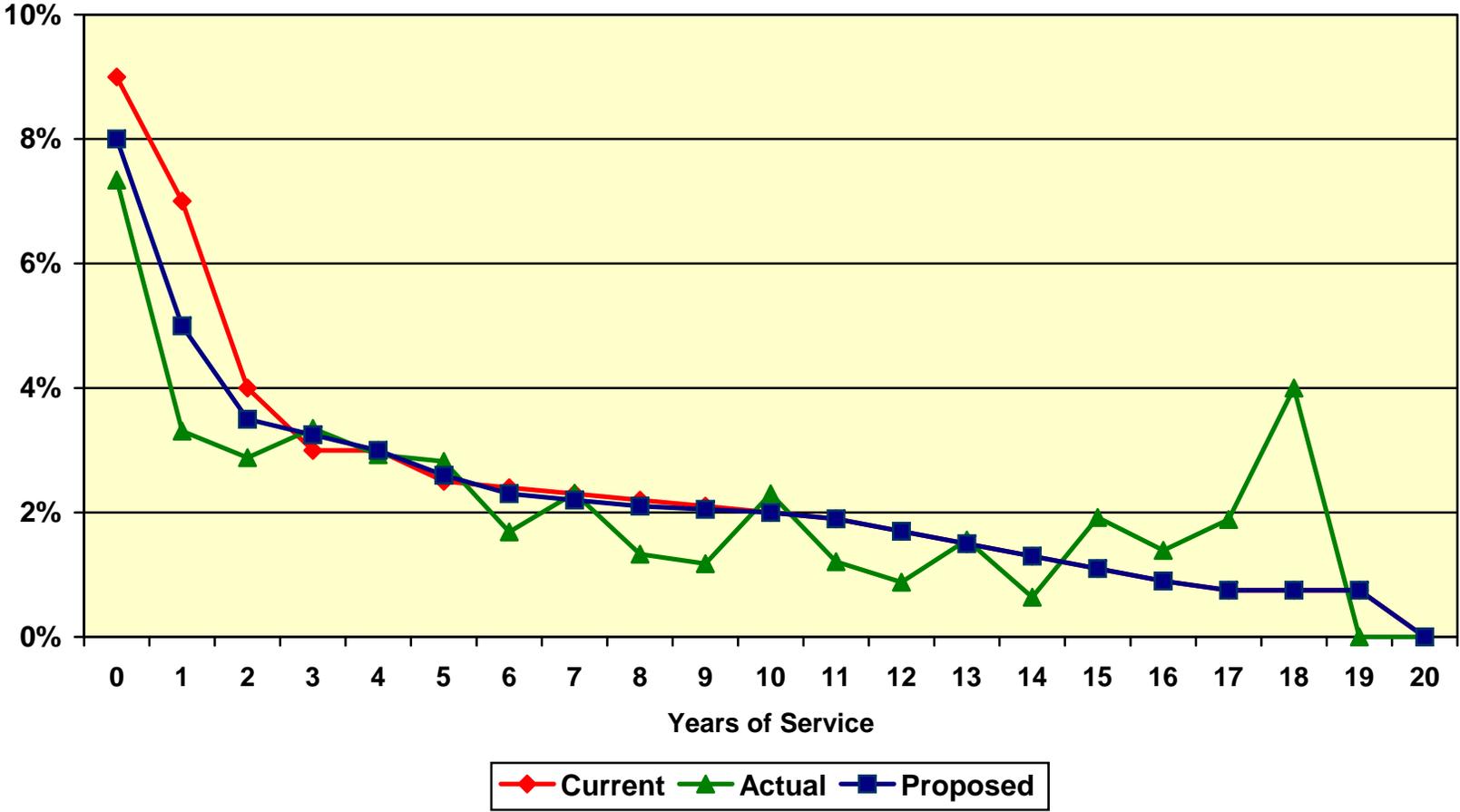
Chart 15
Rates of Electing a Refund of Contributions - General Members

Years of Service

Legend: Current, Actual, Proposed
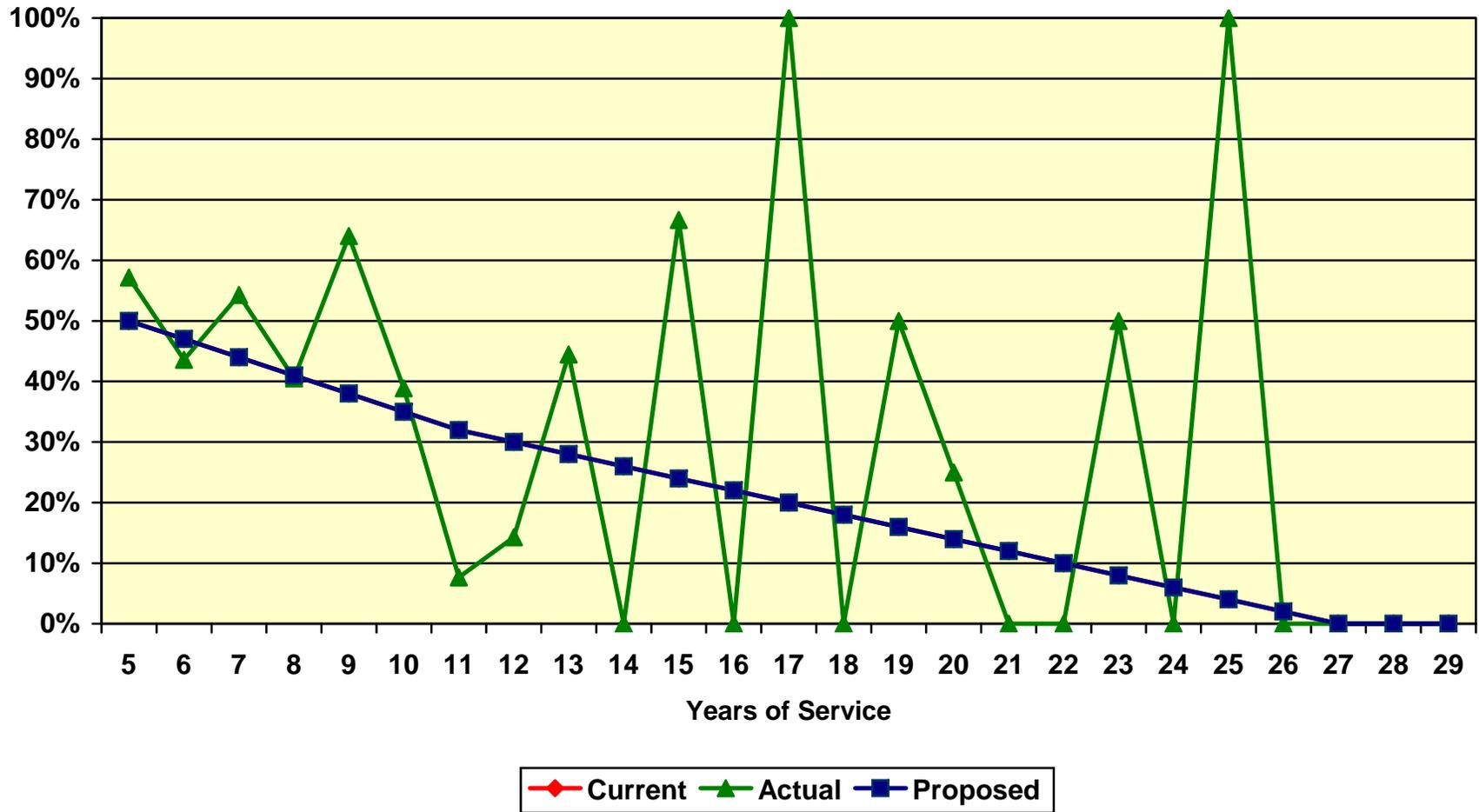
Chart 16
Rates of Electing a Refund of Contributions - Safety Members
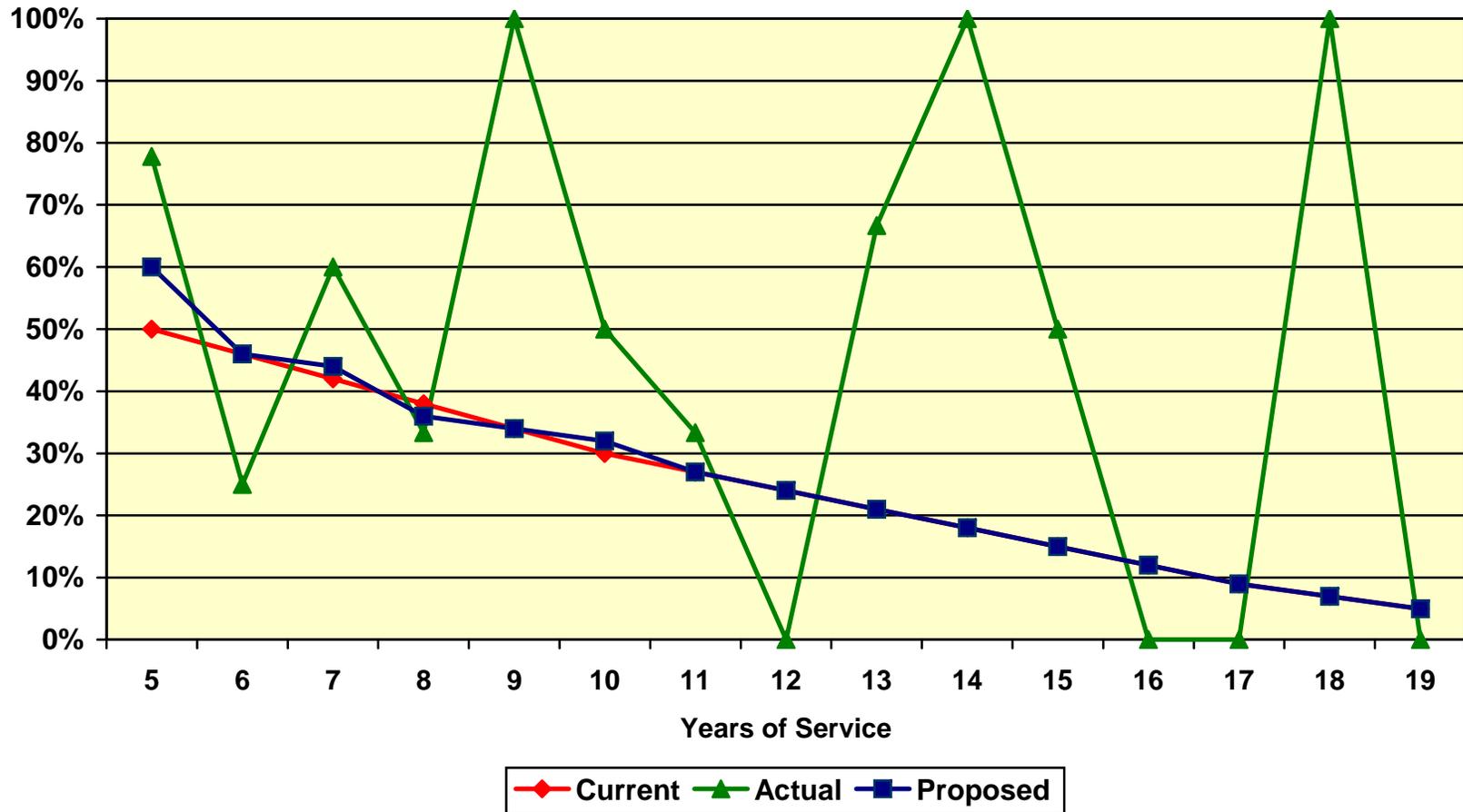
F.   DISABILITY INCIDENCE RATES

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

Rates of Disability Incidence (General)

Age	Current Rate*	Observed Rate	Proposed Rate
20 – 24	0.02%	0.00%	0.02%
25 – 29	0.04	0.00	0.04
30 – 34	0.06	0.00	0.06
35 – 39	0.15	0.08	0.12
40 – 44	0.20	0.04	0.15
45 – 49	0.30	0.23	0.25
50 – 54	0.40	0.25	0.30
55 – 59	0.40	0.18	0.35
60 – 64	0.40	0.34	0.40
65 – 69	0.40	0.54	0.40

*   Total current rate for service and non-service connected disabilities.*

Rates of Disability Incidence (Safety)

Age	Current Rate*	Observed Rate	Proposed Rate
20 – 24	0.05%	0.00%	0.05%
25 – 29	0.15	0.00	0.10
30 – 34	0.25	0.00	0.20
35 – 39	0.45	0.10	0.35
40 – 44	0.70	0.54	0.60
45 – 49	1.10	0.16	0.75
50 – 54	2.00	1.08	1.75
55 – 59	3.50	2.30	3.00
60 – 64	5.00	3.41	4.00

*   Total current rate for service and non-service connected disabilities.*

Chart 17 compares the actual number of non-service connected and service connected disabilities over the past three years to that expected under both the current and proposed assumptions.   The proposed disability rates were adjusted to reflect the past three years' experience. There are mostly decreases in the rates proposed for both General and Safety members.

![Segal Consulting]

Chart 18 shows actual disability incidence rates, compared to the assumed and proposed rates for General members.

Since 55% of disabled General members received a service connected disability, we recommend maintaining the current assumption that 55% of disabilities will receive a service connected disability retirement. The remaining 45% of disabled General members are assumed to receive a non-service connected disability.

Chart 19 graphs the same information as Charts 18, but for Safety members. Since 90% of disabled Safety members received a service connected disability, we recommend maintaining the current assumption that 100% of disabilities will receive a service connected disability retirement. This means that no non-service connected disabilities will be assumed for Safety members.

Chart 17
Actual Number of Disabilities Compared to Expected
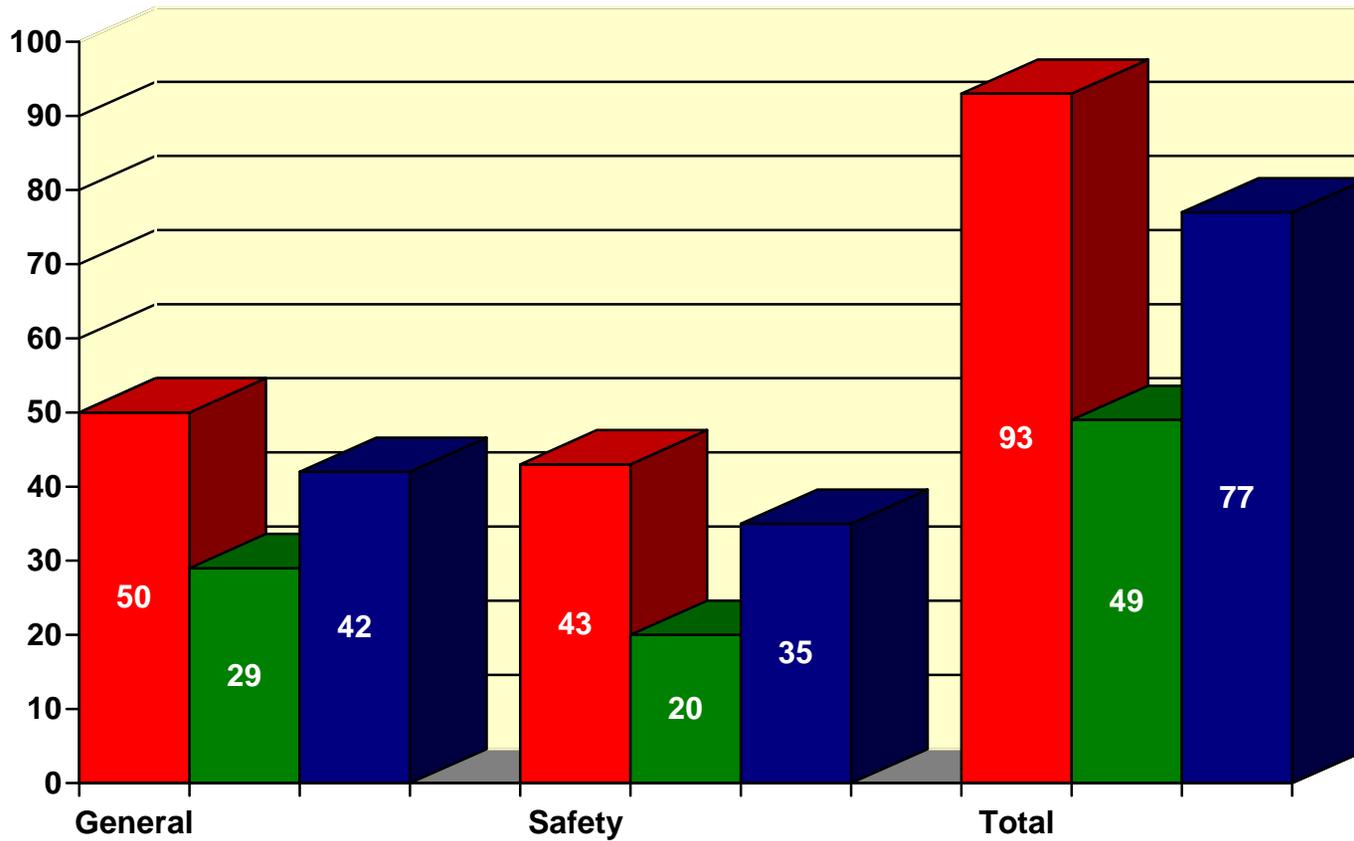
3-Year Totals (Both Service and Non-Service Connected)

Legend: ■ Expected ■ Actual ■ Proposed

Segal Consulting

Chart 18
Disability Incidence Rates for General Members

Segal Consulting
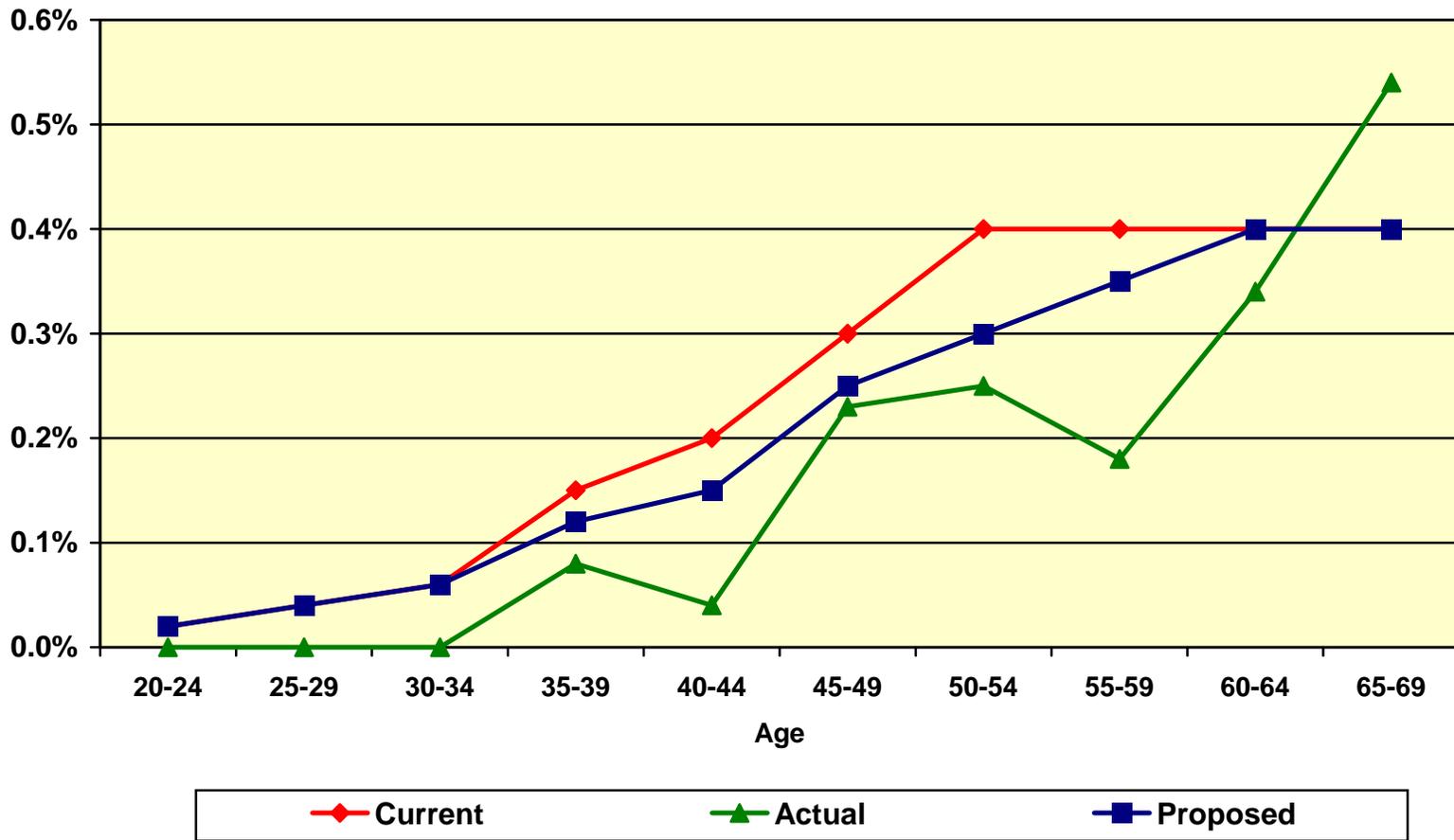
Chart 19
Disability Incidence Rates for Safety Members

Segal Consulting
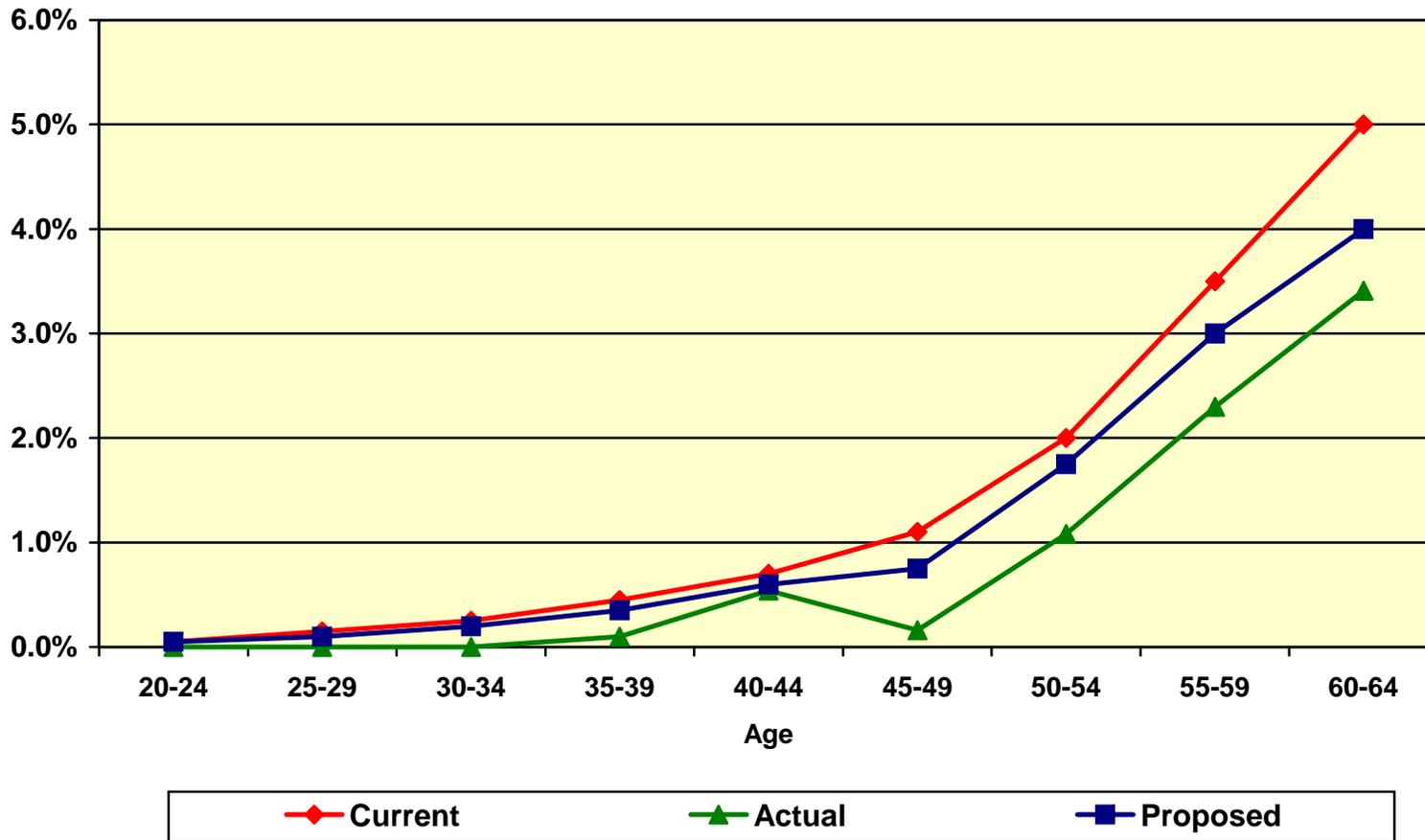
G. PROMOTIONAL AND MERIT SALARY INCREASES

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

➤ Inflationary increases;

➤ Real "across the board" increases; and

➤ Promotional and merit increases.

The inflationary increases are assumed to follow the general annual inflation assumption discussed in our separate economic assumptions report where we recommend maintaining the 3.25% inflation assumption. We also discuss in that report our recommended decrease in the assumption for annual "across the board" pay increases from 0.75% to 0.50%. Therefore, the total assumed inflation and real "across the board" pay increase (i.e., wage inflation) decreases from 4.00% to 3.75%. This is the annual rate of payroll growth at which payments to amortize the Unfunded Actuarial Accrued Liability (UAAL) are assumed to increase.

The annual promotional and merit increases are determined by measuring the actual increases received by members over the experience period, net of the inflationary and real "across the board" pay increases. Increases are measured separately for General and 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 25% 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);

➤ Averaging these annual increases over the three-year experience period; and

➤ Modifying current assumptions to reflect some portion of these measured increases reflective of their "credibility."

The following table shows the General members' actual average promotional and merit increases by years of service over the three-year period from July 1, 2010 through June 30, 2013 along with the actual average based on the current three-year period and those shown in the prior experience study. The current and proposed assumptions are also shown. The actual increases for the most recent three-year period were reduced by an estimate of the actual "across the board" wage inflation for each year over the current three-year experience period (0.9% per year on average).

		General		
Years of Service	**Current Assumptions**	**July 1, 2010 Through June 30, 2013 Average Promotional and Merit Increases**	**Actual Average Increases from Current and Prior Study**	**Proposed Assumptions**
Less than 1	6.00%	4.17%	2.96%	5.50%
1	5.00	-0.85	1.40	4.00
2	4.00	-0.36	1.65	3.50
3	3.00	1.67	2.30	3.00
4	2.50	1.27	1.76	2.25
5	2.00	1.41	1.61	2.00
6	1.75	0.98	1.11	1.75
7	1.50	-0.29	0.16	1.50
8	1.25	-2.24	-1.10	1.25
9	1.00	-1.37	-0.78	1.00
10	0.90	0.68	0.48	0.90
11	0.80	-1.03	-0.63	0.80
12	0.70	-0.09	-0.44	0.70
13	0.60	0.14	-0.39	0.60
14	0.50	-0.63	-0.49	0.50
15	0.50	-1.36	-0.74	0.50
16	0.50	-0.76	-0.55	0.50
17	0.50	0.21	-0.37	0.50
18	0.50	-2.93	-1.89	0.50
19	0.50	-1.84	-1.47	0.50
20 & over	0.50	-0.39	-0.65	0.50

★ Segal Consulting

The following table provides the same information for Safety members. The actual average promotional and merit increases were determined by reducing the actual average total salary increases by an estimate of the actual "across the board" wage inflation for each year over the three-year period (-0.4% per year on average).

		Safety		
Years of Service	**Current Assumptions**	**July 1, 2010 Through June 30, 2013 Average Promotional and Merit Increases**	**Actual Average Increases from Current and Prior Study**	**Proposed Assumptions**
Less than 1	7.00%	9.38%	9.58%	8.00%
1	5.75	4.04	7.25	6.50
2	4.50	-0.80	2.31	5.50
3	3.50	3.78	3.87	4.00
4	3.00	4.55	4.49	3.50
5	2.50	4.49	3.87	3.25
6	2.25	4.59	4.18	3.00
7	2.00	2.00	2.14	2.50
8	1.75	0.54	1.10	1.75
9	1.25	0.46	0.73	1.50
10	1.00	2.36	1.81	1.25
11	0.95	2.01	1.48	1.00
12	0.90	0.68	0.36	0.90
13	0.85	5.83	3.04	0.85
14	0.80	3.04	1.46	0.80
15	0.75	1.39	0.56	0.75
16	0.70	3.67	2.01	0.70
17	0.65	3.46	1.81	0.65
18	0.60	0.58	0.77	0.60
19	0.55	0.80	0.80	0.55
20 & over	0.50	0.71	0.62	0.50

Charts 20 and 21 provide a graphical comparison of the actual promotional and merit increases, compared to the proposed and current assumptions. The charts also show the actual promotional and merit increases based on an average of both the current and previous three-year experience periods. This is discussed below. Chart 20 shows this information for General members and Chart 21 for Safety members.

We realize that the most recent three-year experience period may not be typically indicative of future long-term promotional and merit salary increases. This appears to mainly be the case for Safety members due to the negative wage inflation during the three-year period. Note that, in this situation, our model may lead to higher estimated promotional and merit increases. Therefore, we also examined the promotional and merit salary experience used in the prior experience study. We believe that when the experience from the last two studies are combined into an average result it provides a more reasonable representation of potential future promotional and merit salary increases over the long term. However, in our proposed changes to the promotional and merit increases, we have given relatively less weight to the actual average increases experience during the last two studies.

Based on this experience, we are proposing slight decreases overall in the promotional and merit salary increases for General members and slight increases overall for Safety members.

Chart 20
# Promotional and Merit Salary Increase Rates - General Members

Segal Consulting
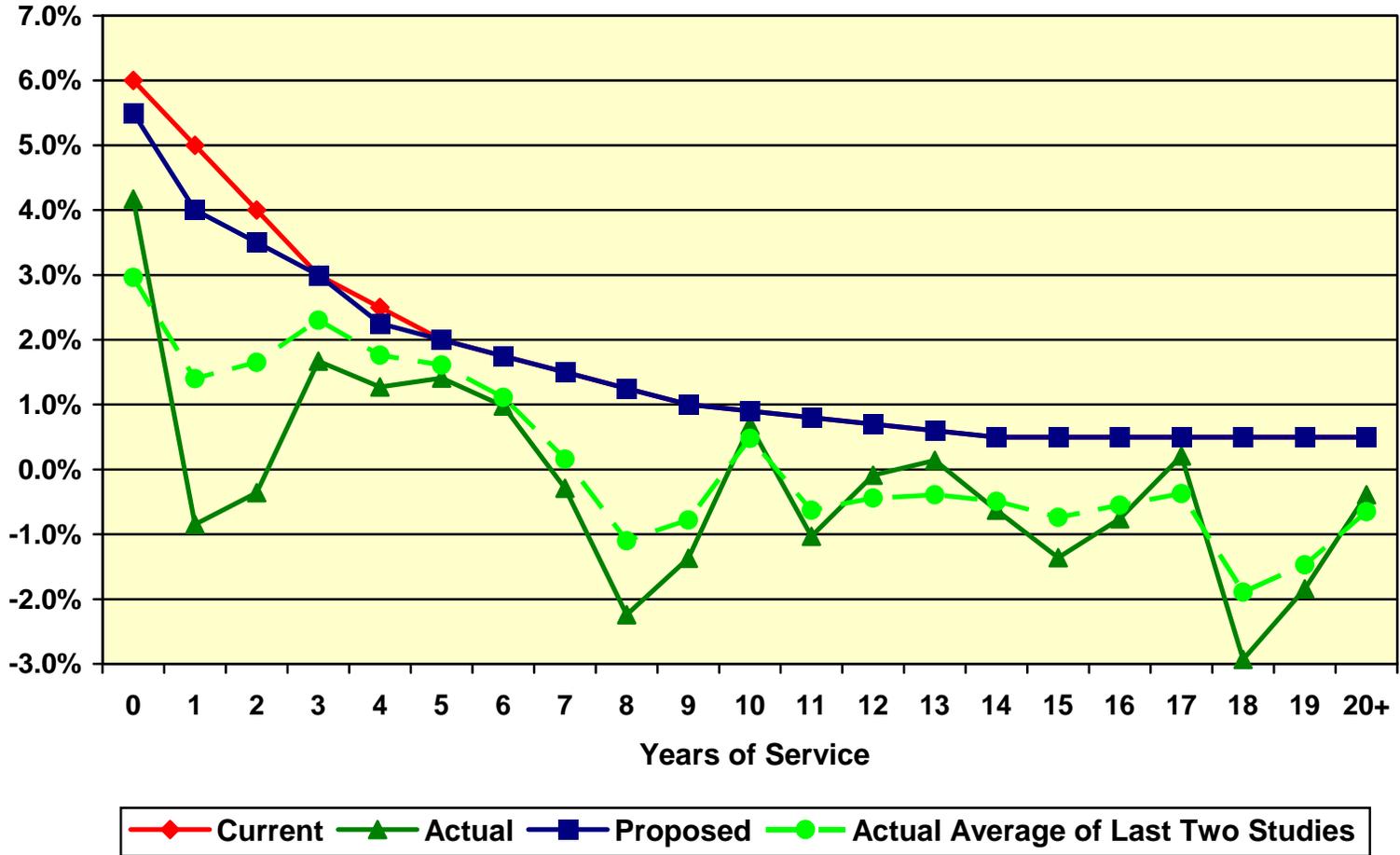
Chart 21
Promotional and Merit Salary Increase Rates -
Safety Members
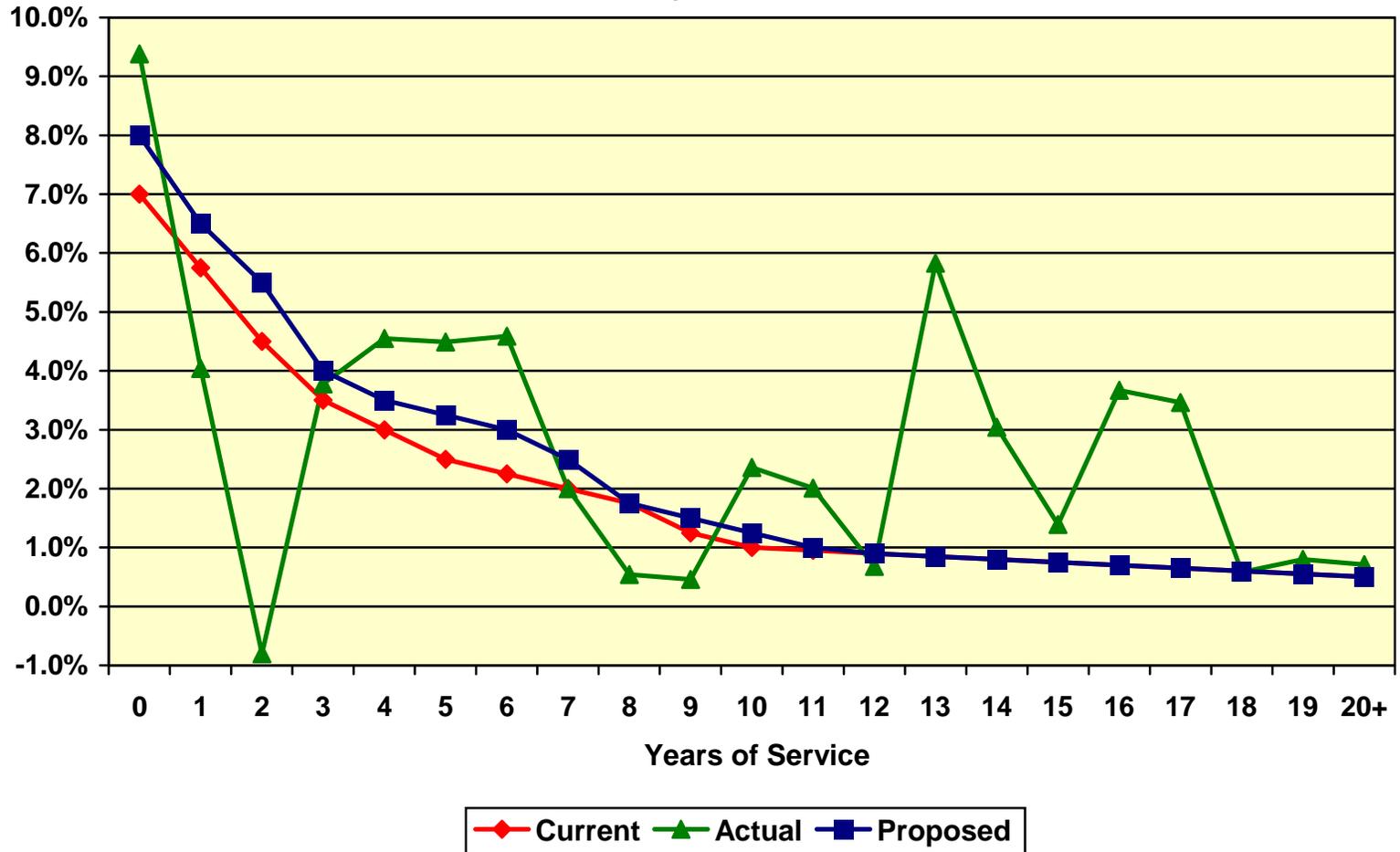
IV. COST IMPACT OF ASSUMPTION CHANGES

The tables below show the changes in the employer and member contribution rates due to the recommended assumption changes as if they were applied to the June 30, 2013 actuarial valuation. If all of the proposed assumption changes (both economic and demographic) were implemented, the Plan's average employer rate would have increased by 4.21% of compensation. The average member rate would have increased by 0.23% of compensation. The Plan's UAAL would have increased by $197 million. The results include the impact of the proposed change to include an explicit administrative expense load of 0.9% of payroll or $5 million annually. As discussed in the economic assumptions report, the cost associated with the administrative expense load has been allocated to both the employer and the member based on the components of the total contribution rate (before expenses) for the member and the employer.

Employer Contribution Rate Impact (% of Compensation)

Contributions	General County w/ Courts	General Districts	Safety	Overall
Normal Cost	0.13%	0.20%	1.14%	0.40%
UAAL	2.23%	1.90%	5.30%	3.00%
Admin Expense	0.81%	0.81%	0.81%	0.81%
Total	3.17%	2.91%	7.25%	4.21%

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

Contributions	General County w/ Courts	General Districts	Safety	Overall
Total	$11,964	$946	$10,476	$23,386

Member Contribution Rate Impact at Sample Entry Ages (Annual Amounts in Dollars)*

Entry Age	General Tier I				General Tier IIA			
	Current	Proposed	Difference	Annual Amount**	Current	Proposed	Difference	Annual Amount**
25	7.06%	7.31%	0.25%	$150	5.03%	5.23%	0.20%	$120
35	8.50%	8.77%	0.27%	$162	6.05%	6.28%	0.23%	$138
45	10.27%	10.56%	0.29%	$174	7.31%	7.56%	0.25%	$150

| | General Tier IIB | | | | General Tier III | | | |
Entry Age	Current	Proposed	Difference	Annual Amount**	Current	Proposed	Difference	Annual Amount**
All	6.00%	6.13%	0.13%	$78	7.80%	7.91%	0.11%	$66

| | Safety Tier I (Excluding "Safety 3") | | | | Safety Tier I ("Safety 3") | | | |
Entry Age	Current	Proposed	Difference	Annual Amount**	Current	Proposed	Difference	Annual Amount**
25	12.38%	13.08%	0.70%	$560	12.86%	13.60%	0.74%	$592
35	14.96%	15.91%	0.95%	$760	12.86%	13.60%	0.74%	$592
45	17.38%	18.37%	0.99%	$792	12.86%	13.60%	0.74%	$592

| | Safety Tier IIA (Excluding "Safety 3") | | | | Safety Tier IIA ("Safety 3") | | | |
Entry Age	Current	Proposed	Difference	Annual Amount**	Current	Proposed	Difference	Annual Amount**
25	8.25%	8.75%	0.50%	$400	8.57%	9.10%	0.53%	$424
35	9.97%	10.63%	0.66%	$528	8.57%	9.10%	0.53%	$424
45	11.59%	12.28%	0.69%	$552	8.57%	9.10%	0.53%	$424

| | Safety Tier IIB | | | |
Entry Age	Current	Proposed	Difference	Annual Amount**
25	12.93%	13.46%	0.53%	$424
35	12.93%	13.46%	0.53%	$424
45	12.93%	13.46%	0.53%	$424

*Member rates shown apply to excess of $350 of monthly compensation for members integrated with Social Security or all compensation for those members that are not integrated with Social Security. These rates are before applying any maximum on the number of years over which members contribute.
**Based on annual compensation of $60,000 for General members and $80,000 for Safety members.

The total estimated annual dollar increase in member contributions is $1.2 million.

The estimated cost increase is mainly the result of the recommendation to lower the investment return assumption from 7.75% to 7.50% per annum and the proposed change to the mortality assumptions.

APPENDIX A

CURRENT ACTUARIAL ASSUMPTIONS AND METHODS

Mortality Rates

Healthy:	For General Members: RP-2000 Combined Healthy Mortality Table set back two years for males and one year for females.
	For Safety Members: RP-2000 Combined Healthy Mortality Table set back two years for males and one year for females.
Disabled:	For General Members: RP-2000 Combined Healthy Mortality Table set forward six years.
	For Safety Members: RP-2000 Combined Healthy Mortality Table set forward one year.
Beneficiaries:	Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who has taken a service (non-disability) retirement.
Member Contribution Rates:	For General Members: RP-2000 Combined Healthy Mortality Table set back two years for males and one year for females weighted 30% male and 70% female.
	For Safety Members: RP-2000 Combined Healthy Mortality Table set back two years for males and one year for females weighted 80% male and 20% female.

Termination Rates Before Retirement:

	Rate (%)			
	Mortality			
	General		**Safety**	
Age	**Male**	**Female**	**Male**	**Female**
25	0.04	0.02	0.04	0.02
30	0.04	0.02	0.04	0.02
35	0.06	0.04	0.06	0.04
40	0.10	0.06	0.10	0.06
45	0.13	0.10	0.13	0.10
50	0.19	0.16	0.19	0.16
55	0.29	0.24	0.29	0.24
60	0.53	0.44	0.53	0.44
65	1.00	0.86	1.00	0.86

All pre-retirement deaths are assumed to be non-service connected.

✸ Segal Consulting

Termination Rates Before Retirement (continued):

	Rate (%)	
	Disability	
Age	**General**[1]	**Safety**[2]
25	0.03	0.11
30	0.05	0.21
35	0.11	0.37
40	0.18	0.60
45	0.26	0.94
50	0.36	1.64
55	0.40	2.90
60	0.40	4.40
65	0.40	0.00

[1] 55% of General disabilities are assumed to be service connected (duty) disabilities and the other 45% are assumed to be non-service connected (ordinary) disabilities.

[2] 100% of Safety disabilities are assumed to be service connected (duty) disabilities.

Termination Rates Before Retirement (continued):

	Rate (%) Withdrawal*	
Years of Service	**General**	**Safety**
0	18.00	9.00
1	13.00	7.00
2	10.00	4.00
3	7.50	3.00
4	6.50	3.00
5	6.00	2.50
6	5.00	2.40
7	4.00	2.30
8	3.75	2.20
9	3.50	2.10
10	3.25	2.00
11	3.00	1.90
12	2.80	1.70
13	2.60	1.50
14	2.40	1.30
15	2.30	1.10
16	2.20	0.90
17	2.10	0.75
18	1.90	0.75
19	1.70	0.75
20	1.50	0.00
21	1.30	0.00
22	1.10	0.00
23	1.00	0.00
24	1.00	0.00
25	1.00	0.00
26	1.00	0.00
27	1.00	0.00
28	1.00	0.00
29	1.00	0.00
30 & Over	0.00	0.00

* Refer to the next table that contains rates for electing a refund of contributions upon withdrawal. No withdrawal is assumed after a member is first assumed to retire.

Termination Rates Before Retirement (continued):

Rate (%)

Years of Service	Electing a Refund of Contributions upon Withdrawal	
	General	**Safety**
0	100%	100%
1	100	100
2	100	100
3	100	100
4	100	100
5	50	50
6	47	46
7	44	42
8	41	38
9	38	34
10	35	30
11	32	27
12	30	24
13	28	21
14	26	18
15	24	15
16	22	12
17	20	9
18	18	7
19	16	5
20	14	0
21	12	0
22	10	0
23	8	0
24	6	0
25	4	0
26	2	0
27 & Over	0	0

Retirement Rates:

	Rate (%)				
Age	General Tier I	General Tiers IIA and IIB	General Tier III	Safety Tier I	Safety Tiers IIA and IIB
45	0.00	0.00	0.00	1.00	0.00
46	0.00	0.00	0.00	1.00	0.00
47	0.00	0.00	0.00	1.00	0.00
48	0.00	0.00	0.00	1.00	0.00
49	0.00	0.00	0.00	6.00	0.00
50	6.00	3.00	0.00	16.00	5.00
51	6.00	3.00	0.00	14.00	5.00
52	6.00	3.00	3.00	16.00	5.00
53	6.00	3.00	3.00	18.00	8.00
54	7.00	3.00	3.00	20.00	18.00
55	9.00	5.00	5.00	22.00	20.00
56	11.00	6.00	6.00	25.00	20.00
57	13.00	7.00	7.00	27.00	20.00
58	16.00	10.00	10.00	30.00	20.00
59	18.00	11.00	11.00	25.00	25.00
60	22.00	13.00	13.00	25.00	25.00
61	25.00	17.00	17.00	25.00	25.00
62	30.00	30.00	30.00	100.00	50.00
63	30.00	30.00	30.00	100.00	50.00
64	30.00	30.00	30.00	100.00	50.00
65	30.00	30.00	30.00	100.00	100.00
66	40.00	40.00	40.00	100.00	100.00
67	40.00	40.00	40.00	100.00	100.00
68	40.00	40.00	40.00	100.00	100.00
69	40.00	40.00	40.00	100.00	100.00
70	100.00	100.00	100.00	100.00	100.00

Retirement Age and Benefit for
Deferred Vested Members: For deferred vested members, we make the following retirement assumption:

       General Age: 57
       Safety Age: 53

We assume that 55% and 60% of future General and Safety deferred vested members, respectively, will continue to work for a reciprocal employer. For reciprocals, we assume 4.75% compensation increases per annum.

Future Benefit Accruals: 1.0 year of service per year.

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

Definition of Active Members: All active members of KCERA as of the valuation date.

Percent Married: 75% of male members and 55% of female members are assumed to be married at pre-retirement death or retirement. There is no explicit assumption for children's benefits.

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

Net Investment Return: 7.75%, net of investment and administration expenses.

Employee Contribution
Crediting Rate: 7.75%, compounded semi-annually.

Consumer Price Index: Increase of 3.25% per year; retiree COLA increases due to CPI are assumed to be 2.50% per year.

Salary Increases:

Annual Rate of Compensation Increase

Inflation: 3.25% per year, plus "across the board" salary increases of 0.75% per year, plus the following promotional and merit increases.

Years of Service	General Members	Safety Members
Less than 1	6.00%	7.00%
1	5.00%	5.75%
2	4.00%	4.50%
3	3.00%	3.50%
4	2.50%	3.00%
5	2.00%	2.50%
6	1.75%	2.25%
7	1.50%	2.00%
8	1.25%	1.75%
9	1.00%	1.25%
10	0.90%	1.00%
11	0.80%	0.95%
12	0.70%	0.90%
13	0.60%	0.85%
14	0.50%	0.80%
15	0.50%	0.75%
16	0.50%	0.70%
17	0.50%	0.65%
18	0.50%	0.60%
19	0.50%	0.55%
20 & Over	0.50%	0.50%

Note: The promotional and merit increases are added to the sum of the inflationary and "across the board" increases.

Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit:

Increase of 3.25% per year from valuation date.

Increase in Section 7522.10 Compensation Limit:

Increase of 3.25% per year from valuation date.

Actuarial Value of Assets:

Market value of assets (MVA) less unrecognized returns in each of the last nine semi-annual accounting periods. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized semi-annually over a five-year period. The actuarial value of assets (AVA) is limited by a 50% corridor; the AVA cannot be less than 50% of MVA, nor greater than 150% of MVA.

Valuation Value of Assets:

Actuarial Value of Assets reduced by the value of the non-valuation reserves and designations.

Actuarial Cost Method: Entry Age Actuarial Cost Method. Entry Age is calculated as age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percent of compensation, with Normal Cost determined as if the current benefit accrual rate had always been in effect.

APPENDIX B

PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Mortality Rates:

Healthy:	For General Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set forward one year for males and females.
	For Safety Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set back one year for males and females.
Disabled:	For General Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set forward eight years for males and females.
	For Safety Members: RP-2000 Combined Healthy Mortality Table, projected with Scale BB to 2023 set forward four years for males and females.
Beneficiaries:	Beneficiaries are assumed to have the same mortality as a General Member of the opposite sex who has taken a service (non-disability) retirement.
Member Contribution Rates:	For General Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set forward one year for males and females weighted 30% male and 70% female.
	For Safety Members: RP-2000 Combined Healthy Mortality Table projected with Scale BB to 2023 set back one year for males and females weighted 80% male and 20%

Termination Rates Before Retirement:

	Rate (%)			
	Mortality			
	General		Safety	
Age	Male	Female	Male	Female
25	0.04	0.02	0.04	0.02
30	0.05	0.03	0.04	0.02
35	0.08	0.05	0.07	0.04
40	0.11	0.07	0.10	0.06
45	0.15	0.11	0.13	0.10
50	0.23	0.17	0.19	0.14
55	0.39	0.27	0.30	0.22
60	0.64	0.45	0.52	0.36
65	1.07	0.83	0.87	0.65

All pre-retirement deaths are assumed to be non-service connected.

Segal Consulting

Termination Rates Before Retirement (continued):

	Rate (%) Disability	
Age	**General**[1]	**Safety**[2]
20	0.02	0.05
25	0.03	0.08
30	0.05	0.16
35	0.10	0.29
40	0.14	0.50
45	0.21	0.69
50	0.28	1.35
55	0.33	2.50
60	0.38	3.60
65	0.40	0.00
70	0.00	0.00

[1] 55% of General disabilities are assumed to be service connected (duty) disabilities and the other 45% are assumed to be non-service connected (ordinary) disabilities.

[2] 100% of Safety disabilities are assumed to be service connected (duty) disabilities.

Termination Rates Before Retirement (continued):

| | Rate (%) | |
| | Withdrawal* | |
Years of Service	General	Safety
0	18.00	8.00
1	14.00	5.00
2	10.00	3.50
3	8.00	3.25
4	6.50	3.00
5	6.00	2.60
6	5.00	2.30
7	4.50	2.20
8	4.00	2.10
9	3.50	2.05
10	3.25	2.00
11	3.00	1.90
12	2.80	1.70
13	2.60	1.50
14	2.40	1.30
15	2.30	1.10
16	2.20	0.90
17	2.10	0.75
18	1.90	0.75
19	1.70	0.75
20	1.50	0.00
21	1.30	0.00
22	1.10	0.00
23	1.00	0.00
24	1.00	0.00
25	1.00	0.00
26	1.00	0.00
27	1.00	0.00
28	1.00	0.00
29	1.00	0.00
30 & Over	0.00	0.00

* Refer to the next table that contains rates for electing a refund of contributions upon withdrawal. No withdrawal is assumed after a member is first assumed to retire.

Termination Rates Before Retirement (continued):

Rate (%)

Years of Service	Electing a Refund of Contributions upon Withdrawal	
	General	Safety
0	100%	100%
1	100	100
2	100	100
3	100	100
4	100	100
5	50	60
6	47	46
7	44	44
8	41	36
9	38	34
10	35	32
11	32	27
12	30	24
13	28	21
14	26	18
15	24	15
16	22	12
17	20	9
18	18	7
19	16	5
20	14	0
21	12	0
22	10	0
23	8	0
24	6	0
25	4	0
26	2	0
27 & Over	0	0

Retirement Rates:

		Rate (%)			
Age	General Tier I	General Tiers IIA and IIB	General Tier III	Safety Tier I	Safety Tiers IIA and IIB
45	0.00	0.00	0.00	2.00	0.00
46	0.00	0.00	0.00	2.00	0.00
47	0.00	0.00	0.00	2.00	0.00
48	0.00	0.00	0.00	2.00	0.00
49	0.00	0.00	0.00	8.00	0.00
50	6.00	3.00	0.00	20.00	6.00
51	6.00	3.00	0.00	16.00	6.00
52	6.00	3.00	3.00	18.00	6.00
53	6.00	3.00	3.00	18.00	8.00
54	8.00	3.50	3.50	20.00	18.00
55	11.00	6.00	6.00	24.00	22.00
56	12.00	6.50	6.50	28.00	22.00
57	15.00	8.00	8.00	28.00	22.00
58	16.00	10.00	10.00	35.00	22.00
59	19.00	11.50	11.50	20.00	20.00
60	23.00	13.50	13.50	20.00	20.00
61	25.00	17.00	17.00	20.00	20.00
62	30.00	30.00	30.00	50.00	50.00
63	30.00	30.00	30.00	50.00	50.00
64	30.00	30.00	30.00	50.00	50.00
65	30.00	30.00	30.00	100.00	100.00
66	40.00	40.00	40.00	100.00	100.00
67	40.00	40.00	40.00	100.00	100.00
68	40.00	40.00	40.00	100.00	100.00
69	40.00	40.00	40.00	100.00	100.00
70	100.00	100.00	100.00	100.00	100.00

Segal Consulting

Retirement Age and Benefit for Deferred Vested Members:

For deferred vested members, we make the following retirement assumption:

General Age:	57
Safety Age:	53

We assume that 55% and 60% of future General and Safety deferred vested members, respectively, will continue to work for a reciprocal employer. For reciprocals, we assume 4.25% compensation increases per annum.

Future Benefit Accruals: 1.0 year of service per year.

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

Definition of Active Members: All active members of KCERA as of the valuation date.

Percent Married: 75% of male members and 55% of female members are assumed to be married at pre-retirement death or retirement. There is no explicit assumption for children's benefits.

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

Net Investment Return: 7.50%, net of investment expenses.

Administration Expenses: 0.90% of payroll allocated to both the employer and member based on the components of the total contribution rate (before expenses) for the employer and member.

Employee Contribution Crediting Rate: 7.50%, compounded semi-annually.

Consumer Price Index: Increase of 3.25% per year; retiree COLA increases due to CPI are assumed to be 2.50% per year.

Salary Increases:

<div align="center">Annual Rate of Compensation Increase</div>

Inflation: 3.25% per year, plus "across the board" salary increases of 0.50% per year, plus the following promotional and merit increases.

Years of Service	General Members	Safety Members
Less than 1	5.50%	8.00%
1	4.00%	6.50%
2	3.50%	5.50%
3	3.00%	4.00%
4	2.25%	3.50%
5	2.00%	3.25%
6	1.75%	3.00%
7	1.50%	2.50%
8	1.25%	1.75%
9	1.00%	1.50%
10	0.90%	1.25%
11	0.80%	1.00%
12	0.70%	0.90%
13	0.60%	0.85%
14	0.50%	0.80%
15	0.50%	0.75%
16	0.50%	0.70%
17	0.50%	0.65%
18	0.50%	0.60%
19	0.50%	0.55%
20 & Over	0.50%	0.50%

Note: The promotional and merit increases are compounded with the sum of the inflationary and "across the board" increases.

Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit: Increase of 3.25% per year from valuation date.

Increase in Section 7522.10 Compensation Limit: Increase of 3.25% per year from valuation date.

Actuarial Value of Assets: Market value of assets (MVA) less unrecognized returns in each of the last nine semi-annual accounting periods. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized semi-annually over a five-year period. The actuarial value of assets (AVA) is limited by a 50% corridor; the AVA cannot be less than 50% of MVA, nor greater than 150% of MVA.

Valuation Value of Assets: Actuarial Value of Assets reduced by the value of the non-valuation reserves and designations.

★ Segal Consulting

Actuarial Cost Method:

Entry Age Actuarial Cost Method. Entry Age is calculated as age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percent of compensation, with Normal Cost determined as if the current benefit accrual rate had always been in effect.

**KERN COUNTY EMPLOYEES'
RETIREMENT ASSOCIATION**

**Review of Economic Actuarial Assumptions
for the June 30, 2014 Actuarial Valuation**

✶ Segal Consulting

**100 Montgomery Street, Suite 500
San Francisco, CA 94104**

June 30, 2014

Board of Retirement
Kern County Employees' Retirement Association
11125 River Run Boulevard
Bakersfield, CA 93311

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

Dear Members of the Board:

We are pleased to submit this report of our review of the June 30, 2014 economic actuarial assumptions for the Kern County Employees' Retirement Association. This report includes our recommendations and the analysis supporting their development.

Please note that June 30, 2014 is also the year of the Kern County Employees' Retirement Association's triennial experience study. The non-economic actuarial assumption recommendations are provided in a separate report.

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

MYM/gxk

5317245v6/13452.107

TABLE OF CONTENTS

Page

I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS

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

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

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

This study was undertaken in order to review the economic actuarial assumptions. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27,[1] "Selection of Economic Assumptions for Measuring Pension Obligations." This Standard of Practice puts forth guidelines for the selection of the economic actuarial assumptions utilized in a pension plan actuarial valuation.

---

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

Please note that the investment return assumption recommended in this report has been developed without taking into consideration the impact of the 50/50 allocation of future "excess earnings" between the retirement and Supplemental Retiree Benefit Reserve (SRBR) asset pools.

We are recommending changes in the investment return and "across the board" salary increase assumptions. Our recommendations for the economic actuarial assumptions for the June 30, 2014 Actuarial Valuation are as follows:

Inflation – Future increases in the Consumer Price Index (CPI) which drives investment returns and active member salary increases, as well as cost-of-living adjustments (COLAs) for retirees. *Recommendation: Maintain the assumed rate of price inflation at 3.25% per annum.*

Investment Return – The estimated average future net rate of return on current and future assets of the Association as of the valuation date. This rate is used to discount liabilities. *Recommendation: Reduce the current investment return assumption from 7.75% per annum to 7.50% per annum. We further recommend changing to an explicit treatment of administrative expenses in the selection of an investment return assumption for use both in funding and in financial reporting required by the Governmental Accounting Standards Board (GASB).*

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

- Inflationary salary increases,

- Real "across the board" salary increases, and

- Promotional and merit increases.

Recommendation: Maintain the current inflationary salary increase assumption at 3.25% and reduce the current real "across the board" salary increase assumption from 0.75% to 0.50%. This means that the combined inflationary and real "across the board" salary increases will decrease from 4.00% to 3.75%. Please note that the promotional and merit increase assumption currently ranges from 0.50% to 7.00% and is a function of a member's years of service. The proposed promotional and merit increase assumptions are provided as part of our triennial experience study of non-economic assumptions, along with the other recommended non-economic assumptions for the June 30, 2014 valuation.

Section II provides some background on basic principles and the methodology used for the review of the economic actuarial assumptions. A detailed discussion of each of the economic assumptions and reasons behind the recommendations is found in Section III.

II. BACKGROUND AND METHODOLOGY

For this study, we analyzed "economic" assumptions only. Our analysis of the "non-economic" assumptions for the June 30, 2014 valuation is provided in a separate report. The primary economic assumptions are inflation, investment return and salary increases.

Economic Assumptions

Economic assumptions consist of:

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

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

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

The setting of these assumptions is described in Section III.

III. ECONOMIC ASSUMPTIONS

A. INFLATION

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

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

Historical Consumer Price Index – 1930 to 2013

(U.S. City Average - All Urban Consumers)			
	25th Percentile	Median	75th Percentile
15-year moving averages	2.6%	3.4%	4.7%
30-year moving averages	3.2%	4.2%	4.9%

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

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

KCERA's investment consultant, Wurts, anticipates an annual inflation rate of 2.40%. Note that, in general, the investment consultants' time horizon for this assumption is shorter than the time horizon we use for the actuarial valuation. We also note that the average inflation rate used by a sample of nine investment advisory firms is 2.54%.

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

traditional U. S. Treasury bonds. As of June 2014, the difference in yields is 2.28%, which provides a measure of market expectations of inflation.

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

Retiree Cost-of-Living Increases

We also recommend maintaining the current assumptions to value the post-retirement COLA benefit at 2.50% per year. The current and proposed COLA assumptions are shown below:

Maximum COLA for all Tiers	Current Assumption	Proposed Assumption
2.50%	2.50%	2.50%

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

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

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

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

B. INVESTMENT RETURN

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

Real Rate of Investment Return

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

The following is the Association's current target asset allocation and the assumed real rate of return assumptions by asset class. The first column of real rate of return assumptions are determined by netting Wurts' total return assumptions by their assumed 2.40% for inflation. The second column of returns (except for Private Equity and Hedge Funds) represents the average of a sample of real rate of return assumptions. The sample includes the expected annual real rate of returns provided to us by Wurts and by eight other investment advisory firms retained by Segal's public sector clients. We believe these assumptions reasonably reflect a consensus forecast of long term future real market returns.[2]

---

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

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

Asset Class	Percentage of Portfolio	Wurts' Assumed Real Rate of Return[1]	Average Real Rate of Return from a Sample of Consultants to Segal's Public Sector Client[2]
Large Cap U.S. Equity	19%	4.50%	5.92%
Small/Mid Cap U.S. Equity	4%	4.50%	6.49%
Developed International Equity	18%	7.40%	6.90%
Emerging Market Equity	4%	10.20%	8.34%
Core Bonds	18%	1.80%	0.73%
High Yield Bonds	4%	2.50%	2.67%
Emerging Market Debt	4%	3.80%	4.00%
TIPS	3%	0.90%	0.35%
Real Estate	5%	4.90%	4.96%
Commodities	6%	4.00%	4.35%
Hedge Funds	10%	4.30%	4.30%[3]
Private Equity	5%	8.10%	8.10%[3]
Total Portfolio	100%	4.70%	4.71%

[1]   Derived by reducing Wurts' nominal rate of return assumptions by their assumed 2.40% inflation rate.

[2]   These are based on the projected arithmetic real returns provided by the investment advisory firms serving the county retirement systems of Kern, Sacramento, Contra Costa, Sonoma, Mendocino, Orange, the LA City Employees' Retirement System, LA Department of Water and Power and the LA Fire & Police Pensions. These return assumptions are gross of any applicable investment expenses.

[3]   For these asset classes, Wurts' assumption is applied in lieu of the average because there is a larger disparity in returns for these asset classes among the firms surveyed and using Wurts' assumption should more closely reflect the underlying investments made specifically for KCERA.

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 current 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 (pessimistic). Few investment managers consistently achieve significant above-market returns net of expenses over long periods." [3]

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 durations of a retirement plan's liabilities.

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

3. Therefore, we recommend that the 4.71% portfolio real rate of return be used to determine the Association's investment return assumption. This is 0.15% lower than the return we used in 2011 to prepare the recommended investment return assumption. This difference is due to changes in the real rate of return assumptions provided to us by the investment advisory firms.

Association Expenses

For funding purposes, the real rate of return assumption for the portfolio needs to be adjusted for investment expenses expected to be paid from investment income. As further discussed later in this report, current practice for KCERA also adjusts for expected administrative expenses. The following table provides these expenses in relation to the actuarial value of assets for the five years ending June 30, 2013.

---

[3] This citation is from ASOP No. 27 prior to the September 2013 revision. In the revised ASOP, Section 3.8.3.d contains the relevant guidance:
"Investment Manager Performance—Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period."

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

FYE	Actuarial Value of Assets[1]	Administrative Expenses	Investment Expenses[2]	Administrative %	Investment %	Total %
2009	$2,025,217	$3,582	$4,638	0.18%	0.23%	0.41%
2010	2,301,434	3,651	4,978	0.16	0.22	0.37
2011	2,795,926	4,884	6,451	0.17	0.23	0.41
2012	2,800,024	5,548	6,965	0.20	0.25	0.45
2013	3,104,770	4,343	8,120	0.14	0.26	0.40
Average				0.17%	0.24%	0.41%

[1] *As of end of plan year.*

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

The average expense percentage over this five-year period is 0.41%. Based on this experience, we have maintained the future expense component at 0.40%. This assumption will be re-examined in subsequent assumption reviews as new data becomes available.

Note related to investment expenses paid to active managers – As cited in footnote 3, the 2014 revision to ASOP No. 27 indicates that the effect of an active investment management strategy should be considered "net of investment expenses." For KCERA, nearly all of the investment expenses were paid for expenses associated with active managers.

We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns ("alpha") earned by that active management. We do not believe that such review would have a significant impact on the recommend investment return assumption developed using the above expense assumption. For now, we propose that any alpha that may be identified would be treated as an increase in the risk adjustment (see discussions that follow for definitions of risk adjustment and confidence level).

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

In 2012, GASB adopted Statements 67 and 68 that replace Statements 25 and 27 for financial reporting purposes. GASB Statements 67 and 68 are effective for plan year 2013/2014 for the Retirement Association and fiscal year 2014/2015 for the employer.[4]

According to GASB, the investment return assumption for use in financial reporting purposes should be based on the long-term expected rate of return on a retirement system's investments and should be net of investment expenses but not of administrative expenses (i.e., without reduction for administrative expenses). As can be observed from the above development of the expense assumption, if the Board wishes to develop a single investment return assumption for both funding and financial reporting purposes, then it would be necessary to exclude the roughly 0.17% administrative expense from the above development and to develop a separate treatment of administrative expenses.

The issues associated with eliminating the consideration of administrative expenses when developing the investment return assumption used for funding, and the alternatives that may be available to the Board in developing the investment return assumption for use in GASB financial reporting purposes are provided at the end of this section. While we do recommend that the Board adopt an investment return for funding that is gross of administrative expenses (as discussed in the end of this Section), the preliminary discussion that follows has first been completed on a net of administrative expenses basis, to allow an "apples to apples" comparison with the current assumption.

Risk Adjustment

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

---

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

The purpose of the risk adjustment (as measured by the corresponding confidence level) is to increase the likelihood of achieving the actuarial investment return assumption in the long term.[5] The 4.71% expected real rate of return developed earlier in this report was based on expected mean or average arithmetic returns. This means there is a 50% chance of the actual return in each year being at least as great as the average (assuming a symmetrical distribution of future returns). The risk adjustment is intended to increase that probability. This is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

Three years ago, the Board adopted an investment return assumption of 7.75%. That return implied no risk adjustment (actually a slightly negative risk adjustment), reflecting a confidence level of 49% that the actual average return over 15 years would not fall below the assumed return, assuming that the distribution of returns over that period follows the normal statistical distribution.[6]

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

If we use the same confidence level of 49% to set this year's risk adjustment, based on the current long-term portfolio standard deviation of 10.40%, provided by Wurts, the corresponding risk adjustment would continue to be slightly negative. Together with the other investment return components, this produces a net investment return assumption of 7.55%, which is lower than the current assumption of 7.75%.

We believe that there should be some margin for adverse deviation in our recommended investment return assumption, as expressed by some positive level of risk adjustment. In particular, a net investment return assumption of 7.50%, together with the other investment return components, would produce a risk adjustment of 0.06%, which corresponds to a confidence level of 51%.

---

[5] This type of risk adjustment is sometimes referred to as a "margin for adverse deviation".

[6] Based on an annual portfolio return standard deviation of 10.30% provided by Wurts in 2011. 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.

As we have discussed in prior years, the risk adjustment model and associated confidence level is most useful as a means for comparing how the Association has positioned itself relative to risk over periods of time.[7] The use of a 51% confidence level should be considered in context with other factors, including:

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

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

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

Taking into account the factors above, our preliminary recommendation is to reduce the net investment return assumption from 7.75% to 7.50%. As noted above, this return implies a 0.06% risk adjustment, reflecting a confidence level of 51% that the actual average return over 15 years would not fall below the assumed return.

Preliminary Recommended Investment Return Assumption

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

---

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

Calculation of Net Investment Return Assumption

Assumption Component	June 30, 2014 Preliminary Recommended Value	June 30, 2011 Adopted Value
Inflation	3.25%	3.25%
Plus Portfolio Real Rate of Return	4.71%	4.86%
Minus Expense Adjustment	(0.40%)	(0.40%)
Minus Risk Adjustment	(0.06%)	0.04%
Total	7.50%	7.75%
Confidence Level	51%	49%

Based on this analysis, our preliminary recommendation is that the investment return assumption be reduced from 7.75% per annum to 7.50% per annum. Our final recommendation follows later in this section after discussion regarding a change in how expected administration expenses are handled.

Comparison with Other Public Retirement Systems

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

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

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

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

⭐ Segal Consulting

14

The detailed survey results show that of the systems that have an investment return assumption in the range of 7.50% to 7.90%, almost half of those systems have used an assumption of 7.50%. The survey also notes that several plans have reduced their investment return assumption during the last year, and others are considering doing so. State systems outside of California tend to change their economic assumptions slowly and so may lag behind emerging practices in this area.

The recommended assumption of 7.50% provides for some margin for adverse deviation within the risk adjustment model and is consistent with the Associations's current practice relative to other public systems.

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

The Governmental Accounting Standards Board (GASB) has adopted Statements 67 and 68 that replace Statements 25 and 27 for financial reporting purposes. We now discuss the issues and policy alternatives available to KCERA in developing its investment return assumptions in a manner that will allow the Plan to maintain consistency in its liability measurements for funding and financial reporting purposes.

Background

GASB Statement 67 governs the Plan's financial reporting and is effective for plan year 2013/2014, while GASB Statement 68 governs the employers' financial reporting and is effective for fiscal year 2014/2015. The new Statements specify requirements for measuring both the pension liability and the annual pension expense incurred by the employers. The new GASB requirements are only for financial reporting and do not affect how the Plan determines funding requirements for its employer. Nonetheless, it is important to understand how the new financial reporting results will compare with the funding requirement results. The comparison between funding and GASB financial reporting results will differ dramatically depending on whether one is considering measures of the accumulated pension liability or measures of the current year annual pension contribution/expense:

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

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

✦ Segal Consulting

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

Treatment of Expected Administrative Expenses when Measuring Liabilities

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

While KCERA could continue to develop its funding investment return assumption net of both investment and administrative expenses, that would mean that the Association would then have two slightly different investment return assumptions, one for funding and one for financial reporting. To avoid this apparent discrepancy and to maintain the consistency of liability and Normal Cost measures described above, we believe that it would be preferable to use the same investment return assumption for both funding and financial reporting purposes. This means that the assumption for funding purposes would be developed on a basis that is net of only investment expenses, with an explicit assumption for administrative expenses.

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

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

If the Board wishes to develop a single investment return assumption for both funding and financial reporting purposes, then it would be necessary to exclude the administrative expense component of about 0.17% from development of the 7.50% investment return preliminary recommendation. Under this approach, because these economic assumptions are generally changed in ¼% increments, there would be no change in the recommended investment return assumption as developed earlier in this report. Instead, there would be an increase in the risk adjustment of 0.17% (from 0.06% to 0.23%), with a corresponding increase in the confidence level from 51% to 53%.

Under this approach, there would also be an explicit loading for administrative expenses. There are various ways to set the explicit administrative expense load assumption, but ultimately the method should result in an assumption that is approximately equivalent to about 0.9% of payroll or $5 million annually.

This approach and our final recommendation for the investment return assumption is presented in the following table.

Calculation of Net Investment Return Assumption

Assumption Component	June 30, 2014 Recommended Values if Used only for Funding (Net of Admin. Expenses)	June 30, 2014 Recommended Values for both Funding and Financial Reporting (Gross of Admin. Expenses)
Inflation	3.25%	3.25%
Plus Portfolio Real Rate of Return	4.71%	4.71%
Minus Expense Adjustment	(0.40%)	(0.23%)
Minus Risk Adjustment	(0.06%)	(0.23%)
Total	7.50%	7.50%
Confidence Level	51%	53%
Increase in combined Employer and Employee Contributions Due to Explicit Load for Administrative Expenses (Cost as % of Payroll)	Not Applicable	0.90% of pay

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

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

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

★ Segal Consulting

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

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

4. It is not straightforward to quantify precisely the current implicit sharing of administrative expenses between employers and employees. This means that an exact reproduction of that allocation on an explicit basis will be difficult to develop. This in turn means that KCERA would need to develop a new basis for sharing the cost of administrative expenses, one that if desired, approximately reproduces the current allocation. Alternatively, KCERA could decide to treat administrative expenses as a loading applied <u>only</u> to the employer contribution rates, which is the practice followed by private plans, both single employer and multi-employer.

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

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

In addition, we recommend that a separate, explicit administrative expense load assumption be developed. There are various ways to set the explicit administrative expense load assumption, but

Segal Consulting

19

ultimately the method should result in an assumption that is approximately equivalent to about 0.17% of assets or $5 million annually, which is about 0.90% of payroll.

The more significant issues mentioned in (3), (4) and (5) above concern whether or not the costs associated with the administrative expenses should continue to be allocated to both the employers and the employees. Unless the Board wishes to charge administrative expenses only to the employers, we propose a method whereby the costs associated with the explicit assumption for administrative expenses continue to be allocated to both employers and employees. A straightforward way to do that in a manner generally consistent with current practice would be to allocate expenses based on the components of the total contribution rate (before expenses) for employers and employees. These components would be employee Normal Cost contributions, employer Normal Cost contributions and employer UAAL contributions. **Of the total administrative expenses of about $5 million or 0.90% of payroll, this would result in about $0.5 million or 0.09% of payroll being allocated to the employees and $4.5 million or 0.81% of payroll being allocated to the employers in the aggregate.**

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

If the Board decides to leave the recommended investment return assumption of 7.50% on a net of administrative expense basis for funding purposes, we believe there still is a way to use that same 7.50% for financial reporting purposes under GASB. Under this approach, what appears to be the same 7.50% assumption would actually be used as two slightly different assumptions: 7.50% net of administrative expenses for funding, and 7.50% gross of administrative expenses for financial reporting. This would indirectly result in an increase in the margin for adverse deviation or "confidence level" associated with the use of the recommended 7.50% assumption from 51% as used for funding purposes to 53% only as used for financial reporting purposes.

The following table summarizes the components of the investment return assumption under this approach, using the recommended 7.50% assumption for both funding (net of administration expenses) and financial reporting (gross of administration expenses), but with differing treatment of administrative expenses:

Calculation of Net Investment Return Assumption

Assumption Component	June 30, 2014 Recommended Values if Used only for Funding (Net of Admin. Expenses)	June 30, 2014 Alternative Values for Financial Reporting (Gross of Admin. Expenses)
Inflation	3.25%	3.25%
Plus Portfolio Real Rate of Return	4.71%	4.71%
Minus Expense Adjustment	(0.40%)	(0.23%)
Minus Risk Adjustment	(0.06%)	(0.23%)
Total	7.50%	7.50%
Confidence Level	51%	53%

Note that under both Option A and Option B the confidence level for financial reporting increases from 51% to 53% (because the risk adjustment increases from 0.06% to 0.23%). The difference is that under Option A the same confidence level increase would apply for funding purposes, along with the addition of an explicit loading on the contribution rates for administrative expenses.

Segal Consulting

C. SALARY INCREASE

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

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

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

    As discussed earlier in this report, we are recommending that the assumed rate of inflation be maintained at 3.25%. This inflation component is used as part of the salary increase assumption.

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

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

    The real pay increase assumption is generally considered a more "macroeconomic" assumption, that is not necessarily based on individual plan experience.

    Considering these factors, we recommend reducing the real "across the board" salary increase assumption from 0.75% to 0.50%. This means that the combined inflation and "across the board" salary increase assumption will decrease from 4.00% to 3.75%.

3. Promotional and Merit Increases – As the name implies, these increases come from an employee's career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For KCERA, there are service-specific merit and promotional increases. These assumptions have been reviewed as part of our triennial experience study as of June 30, 2013.

Recommended promotional and merit assumptions are provided as part of our triennial experience analysis.

All three of these forces will be incorporated into a salary increase assumption which is applied in the actuarial valuation to project future benefits and future normal cost contribution collections.

Active Member Payroll

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

We recommend that the active member payroll increase assumption be decreased from 4.00% to 3.75% annually, consistent with the combined inflation plus real "across the board" salary increase assumptions.