Utah Retirement Systems

Actuarial Experience Study

For the Five-Year Period Ending December 31, 2016

GRS Retirement Consulting

P: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

August 17, 2017

Mr. Daniel D. Andersen
Executive Director
Utah Retirement Systems
540 East 200 South
Salt Lake City, UT 84102-2099

Subject: Results of 2017 Actuarial Experience Study for URS

We are pleased to present our report on the results of the 2017 Actuarial Experience Study for the Utah Retirement Systems (URS). This report is generally based on plan experience during the five-year period ending December 31, 2016.

This report includes summaries and analysis of the experience data. Based on this analysis, we have recommended a new set of actuarial assumptions to be effective for the January 1, 2017 actuarial valuation. In addition, the report provides the estimated effect on the actuarial liabilities and contribution rates if our recommendations are adopted.

Using the recommended set of actuarial assumptions should present a more accurate portrayal of URS's actuarial condition and should reduce the magnitude of future experience gains and losses.

The study was conducted in accordance with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Mr. White meets the Qualification Standards of the American Academy of Actuaries. Both of the undersigned have experience with large public sector retirement systems.

We wish to thank the URS staff for their assistance in providing data for this study.

Sincerely,

Lewis Ward
Consultant

Daniel J. White, FSA, MAAA, EA
Senior Consultant

K:\3012\2017\Exp\Report\URS ExpStudyRpt2017.docx

Table of Contents

SECTION A

EXECUTIVE SUMMARY

Executive Summary

1. Purpose
   a. Review all current actuarial assumptions and methods and compare to actual recent experience.
   b. Used data from the five-year period ending December 31, 2016 (data over longer or shorter periods were used, where appropriate).
   c. Where appropriate, propose modifications to the assumptions to better reflect anticipated experience.

2. Annual (price) inflation rate
   a. Decrease price inflation assumption from 2.60% to 2.50%.
   b. Five-year average increase in CPI-U is 1.36%, 10-year average is 1.81%, 20-year average is 2.12%.
   c. Current bond market predicts inflation of 1.97% over the next 20 years, most investment consultants' capital market assumptions are at or below 2.5%.
   d. It is a component of the investment return assumption, salary increase assumption, COLA assumption, and assumed payroll growth rate.

3. Annual investment return rate
   a. Currently 7.20% per annum.
   b. Assumed annual rate represents total return, net of administrative and investment expenses and is currently composed of a 2.60% inflation rate and a 4.60% net real rate of return.
   c. Actual market return was 5.1% for last 10 years and 6.9% for the last 20 years.
   d. Analyzed assumption based on the target asset allocation and forward-looking capital market expectations.
   e. Probability of meeting or exceeding a 7.20% investment return assumption over the next 20 years using 20-30 year capital market assumptions is 49%.
   f. Recommend a decrease in the nominal investment return assumption from 7.20% to least 7.00%, with 6.95% or 6.90% as other possible assumptions. The Board elected to use a 6.95% assumption.

4. COLA assumption
   a. Current assumption is 2.60% for funds with a 4.00% annual COLA max and 2.50% for funds with a 2.50% annual COLA max.
   b. Actual increase based on annual change in price inflation, i.e. CPI-U.
   c. Recommend decrease in COLA assumption for funds with 4.00% annual COLA max from 2.60% to 2.50% and no change to the COLA assumption for funds with 2.5% annual COLA max.

5. Salary increase rate
    a. Separate assumptions currently used for state employees, teachers, and other groups.
    b. Assumption is composed of wage inflation and service-related increases to capture step-increases, promotions, additional degrees, etc.
    c. Wage inflation equals price inflation plus "productivity" increases.
    d. Currently wage inflation assumption is 3.35% for all employee groups (2.60% price inflation plus 0.75% productivity).
    e. Recommend decreasing wage inflation from 3.35% to 3.25%, to be consistent with reduction in inflation component to 2.50%.
    f. Currently use graded scale based on years of service for shorter service employees.
    g. Recommend decreases in the service-related increases for most groups.

6. Payroll growth rate
    a. Rate at which the total payroll is expected to grow each year.
    b. Current assumed payroll growth rate is 3.10%.
    c. Only affects contribution rates, not actuarial liabilities.
    d. Recommend decreasing assumption to 3.00%, to reflect the decrease in the price inflation assumption.

7. Post-retirement mortality for healthy retirees:
    a. Current table for non-educator males is based on the RP-2000 Combined Mortality Table with White Collar adjustments. The tables for educators (males and females) and non-educator females are based on the mortality experience of Utah educators.
    b. The current mortality assumption also projects that mortality will improve with Scale AA.
    c. The experience shows that mortality for all groups except for male teachers the current assumption and mortality improvement scale provided a reasonable fit.
    d. We are recommending a new mortality table based on combined URS experience be constructed. We will use a multiplier adjustment for any differences between the different employee groups (such as educators and general employees). We recommend the continued use of the mortality improvement Scale AA.

8. Disabled mortality:
    a. Current assumption is based on the RP-2000 mortality tables for Disabled with projected improvement using Scale AA.
    b. Relatively few disabled retirees compared to the number of service retirees.
    c. Recommend updating base mortality table to RP-2014 mortality table for Disabled lives with continued use of Scale AA for mortality improvement.

9. Pre-termination mortality:
    a. Recommend changing the base tables to the RP-2014 Employee mortality tables for white collar occupations for both males and females to provide a better fit with experience.
    b. This is a low-significance assumption.

10. Disability incidence:
    a. Recommend minor adjustments to this assumption.
    b. Rates for state and local government employees, state employees, and public safety members were slightly reduced. Rates for firefighters were increases slightly.

11. Retirement:
    a. Retirement rates were decreased each of the last two studies.
    b. The experience shows that only fine tuning of rates needed. Some rates will increase and some will decrease.
    c. Changes are not expected to have material impact.

12. Termination:
    a. Used to model the behavior of members leaving their employer prior to being eligible to commence a retirement benefit.
    b. Experience indicates changes needed to most groups.
    c. Recommend modifications to the termination rates for each employee group. Some rates will increase and some will decrease.

13. Marriage assumption:
    a. Current assumption: 100% of members are married. Children's benefits are ignored.
    b. Used in valuing active member death benefits
    c. Census data suggest the current assumption is reasonable.

14. Other assumptions: Recommend no changes in any of the other miscellaneous assumptions.

15. Actuarial Cost Method:
    a. Entry Age Normal actuarial method.
    b. Most widely used method among large public plans.
    c. Recommend no change.

16. Actuarial Value of Assets Method:
    a. Current method phases in differences between actual net market return and assumption over a five-year period, at 20% per year.
    b. Actuarial value constrained to be between 75% and 125% of market value.

17. Amortization period:
    a. The calculated contribution rates are determined using a maximum 20 year period amortization period.
    b. The actuarially determined contribution rate will be a floor contribution requirement.
    c. Current law allows for the Board to set the contribution rates at the greater of the prior year's rate or the calculated rate as long as the funds are less than 110% funded. The actual funding period for most funds is less than 20 years.
    d. Recommend the actuarially determined contribution rate be determined in future years using a 20-year period (i.e. 20-year open) for all the funds except the Governors and Legislators Pension Plan.
    e. Since the Governors and Legislators Pension Plan is funded by direct appropriations rather than through pay-period contributions, we recommend continuing to use a closed amortization period for the next three years and reevaluate the policy during the next experience study.
    f. Several higher education employers (Higher Ed) have made the decision to classify their new employees in such a manner that they are not eligible for participation in URS. We recommend that any employer who meets that criteria be transferred to a new risk pool which reflects the fact that payroll will not increase over time, but will actually decrease due to the lack of new covered members.
    g. For this new Higher Ed risk pool we recommend that the amortization payment for the risk pool be no less than the amount necessary to amortize the unfunded liability over a closed funding period of 20 years from January 1, 2017.

SECTION B

INTRODUCTION

Introduction

In determining liabilities and contribution rates for retirement plans, actuaries must make assumptions about the future. Among the assumptions that must be made are:

- Retirement rates
- Mortality rates
- Turnover rates
- Disability rates
- Investment return rate
- Salary increase rates
- Inflation rate

For some of these assumptions, such as the mortality rates, past experience provides important evidence about the future. For other assumptions, such as the investment return rate, the link between past and future results is much weaker. In either case, actuaries should review their assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

URS has an experience study done every third year. The last one was prepared in conjunction with the January 1, 2014 actuarial valuation. For this experience study, we have reviewed and analyzed URS's data for the five-year period from December 31, 2011 through December 31, 2016. Note that the first two years, calendar years 2012 and 2013, were also included in the prior experience study.

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results. It is known, for example, that the health of the general economy can impact salary increase rates and withdrawal rates. Using results gathered during a short-term boom or bust will not be representative of the long-term trends in these assumptions. Also, the adoption of legislation, such as plan improvements or changes in salary schedules, will sometimes cause a short-term distortion in the experience. For example, if an early retirement window or a significant change in benefit provision occurs during the study period, we would usually see a short-term spike in the number of retirements followed by a dearth of retirements for the following two-to-four years. On the other hand, using a much longer period would delay the recognition of real changes that may be occurring, such as mortality improvement or a change in the ages at which members retire. In our view, using a five-year period is reasonable for URS.

In a few instances, such as the analysis of individual salary increases, we looked at data over a longer period, up to ten years, in order to smooth some of the year-to-year fluctuations and increase the soundness of our conclusions. For example, in the case of salary increases, we used data gathered for the last ten years because the results are quite variable from year to year.

In an experience study, we first determine the number of deaths, retirements, etc. that occurred during the period. Then we determine the number that was expected to occur, based on the current actuarial assumptions. The "expected" number is determined by multiplying the probability of the occurrence at the given age, by the "exposures" at that same age. For example, let's look at the

current rate of retirement of 15% at age 55 for local government males. The “exposures” for this assumption in each year is the number of male local government members who are age 55 and eligible for unreduced retirement at that time. The exposures are totaled for all five years of the study. Then we multiply this total by the current 15% retirement rate to determine the number expected to retire (unreduced) at age 55 during the period. Finally, we calculate the A/E ratio, where "A" is the actual number (of retirements, for example) and "E" is the expected number.

If the current assumptions were "perfect", the A/E ratio would be 100%. When the A/E ratio varies significantly from this figure, it is a sign that new assumptions may be needed. Of course, we not only look at the assumptions as a whole, but we also review how well they fit the actual results by sex, by age, and by service. In some cases, we attempt to set our assumptions to produce an A/E ratio somewhat higher or lower than 100%, in order to introduce some conservatism into the results.

If the data leads the actuary to conclude that new tables are needed, the actuary "graduates" or smoothens the results, since the raw results can be quite uneven from age to age or from service to service.

Please bear in mind that, while the recommended assumption set represents our best estimate, there are other reasonable assumptions sets that could be supported. Some reasonable assumption sets would show much higher or lower liabilities or costs. For example, while our analysis concludes that the current 3.35% wage inflation assumption should be decreased to 3.25%, others might argue that a different rate is more appropriate.

Organization of Report

Section C contains our findings and recommendations for each actuarial assumption. The impact of adopting our recommendations on liabilities and contribution rates is shown in Section D. Section E summarizes the recommended changes. Tables summarizing the analysis of the assumptions are in Section F. We have attached an appendix summarizing the recommended actuarial assumptions and methods.

Throughout this report, the terms “teachers” and “educators” are meant to be used interchangeably, referring to members of the Contributory and Noncontributory Public Employees Retirement Systems who are coded as educators in data supplied by URS. The terms “state employees” and “general state employees” refer to all members of the State & School funds in the Public Employees Retirement Systems who are not teachers. (Therefore, this group includes non-professional employees of the school districts.) The terms “local government employees” and “general local government employees” refer to members of the Public Employees Retirement Systems who are members of the Local Government funds. That is, “local government employees” will not be used to refer to members of the Public Safety Retirement Systems or the Firefighters Retirement System, for whom the terms “public safety employees” and “firefighters” are reserved.

Section F Exhibits

The exhibits in Section F should generally be self-explanatory. For example, on page 67, we show the exhibit analyzing the termination rates for male educators. The second column shows the total

number of male teachers who terminated during the study period. This excludes members who died, became disabled or retired. Column (3), labeled “Total Count” shows the total exposures. This is the number of males who could have terminated during any of the years. On this exhibit, the exposures exclude anyone eligible for retirement. A member is counted in each year he could have terminated, so the total shown is the total exposures for the five-year period. Colum (4) shows the probability of termination based on the raw data. That is, it is the result of dividing the actual number of terminations (col. 2) by the number exposed (col. 3). Column (5) shows the current termination rate and column (6) shows the new recommended termination rate. Columns (7) and (8) show the expected numbers of terminations based on the current and proposed termination assumptions. Columns (9) and (10) show the Actual-to-Expected ratios under the current and proposed termination assumptions.

SECTION C

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Analysis of Experience and Recommendations

This report will begin with a review of the economic assumptions: inflation, the investment return rate, the salary increase assumptions, the payroll growth rate, the COLA assumption, etc. Then the report will cover the demographic assumptions: mortality, disability, termination, retirement, etc. Finally, the report will discuss the recommended actuarial methods.

Economic Assumptions

Actuaries are guided by the Actuarial Standards of Practice (ASOP) adopted by the Actuarial Standards Board (ASB). One of these standards is ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations. This standard provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans

As no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

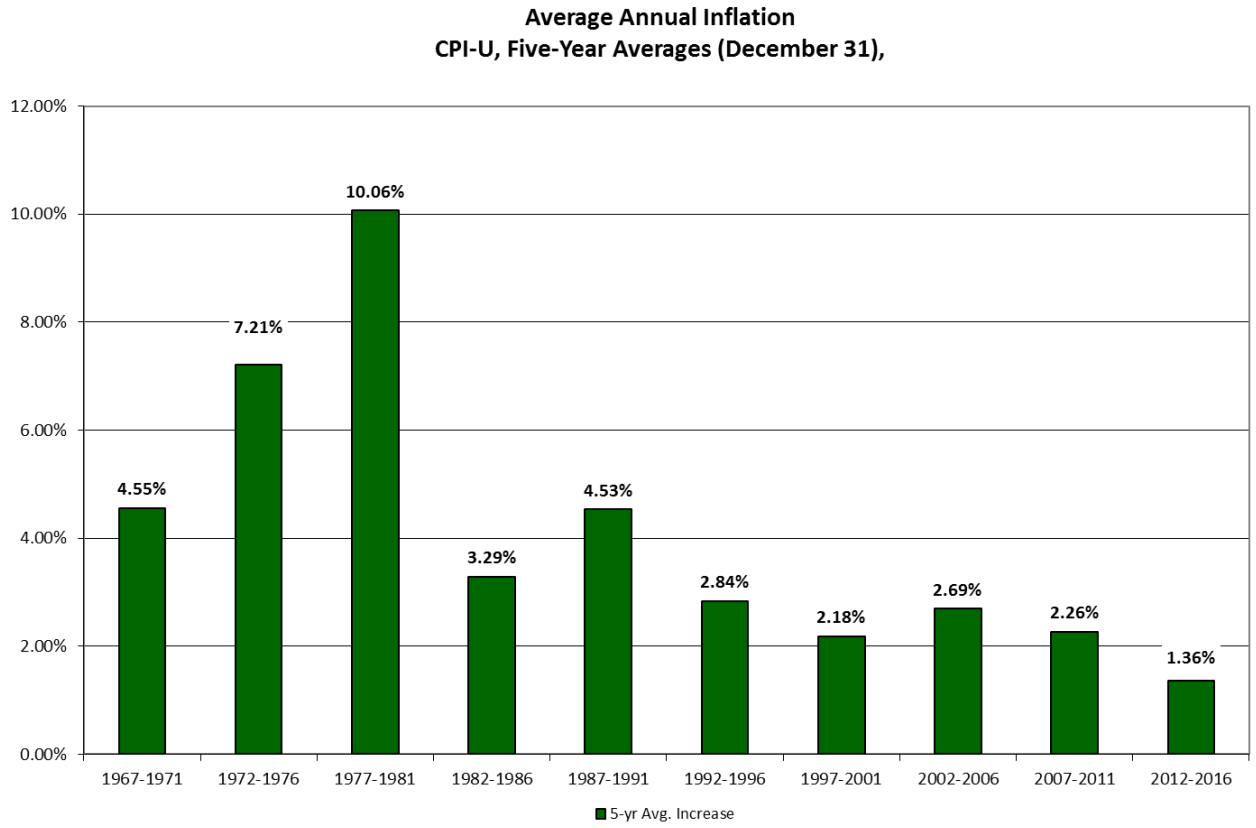
Under ASOP No. 27, each economic assumption must individually, in the actuary's judgment, be deemed reasonable. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period. Nevertheless, the economic assumptions are much more subjective in nature than the demographic assumptions, which in itself can still create a difference in opinion among individuals in the actuarial profession and possibly stakeholders of the Retirement System.

Inflation rate

By "inflation," we mean price inflation, as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It impacts investment return, salary increases, payroll growth, and cost-of-living increases. The current annual inflation assumption is 2.60%.

The chart on the next page shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years:

Analysis of Experience and Recommendations



Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

The table below shows the average inflation over various periods, ending Dec. 2016:

Periods Ending Dec. 2016	Average Annual Increase in CPI-U
Last five (5) years	1.36%
Last ten (10) years	1.81%
Last fifteen (15) years	2.10%
Last twenty (20) years	2.12%
Last thirty (25) years	2.27%
Last thirty (30) years	2.64%
Since 1913 (first available year)	3.14%

Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

As you can see, inflation has been relatively low over the last thirty years.

Analysis of Experience and Recommendations

Most of the investment consulting firms, in setting their capital market assumptions, currently assume that inflation will be less than 2.50%. We examined the 2017 capital market assumption sets for five investment consulting firms: BNY Mellon, Callan (URS's consultant), Aon Hewitt, JP Morgan, R.V. Kuhns. The average assumption for inflation was 2.30%, with a range of 2.00% to 2.50%. However, the investment consulting firms typically set their assumptions based on a ten-year outlook, while actuaries must make much longer projections.

In the Social Security Administration's 2016 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.6% under the intermediate cost assumption. (The low cost assumption was 2.0% and the high cost assumption was 3.2%.) These inflation forecasts have gradually decreased and the range (i.e. difference between the low-cost and high-cost scenarios) narrowed in the last few years.

Another source of information about future inflation is the market for US Treasury bonds. The December 31, 2016 yield for a 20-year inflation indexed Treasury bond (20-year TIPS) was 0.82% plus actual inflation. The yield for a 20-year non-indexed US Treasury bond was 2.79%. This means that on that day the bond market was predicting that inflation over the next twenty years would average 1.97% (2.79% – 0.82%) per year. One year earlier, as of December 31, 2015, the spread between the 20-year inflation protected and constant maturity bonds was only slightly less, with a difference of 1.58%, so there has been little change in expected inflation. The difference in yields between the 30-year TIPs, and 30-year Treasury bond was 2.05% as of December 31, 2016, so the bond market is not predicting higher inflation in the next 30 years.

However, this analysis is known to be imperfect. It ignores the inflation risk premium that buyers of US Treasury bonds should ask for, and it ignores the differences in liquidity between US Treasury bonds and TIPS.

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their most recent forecast, first quarter of 2017, was for inflation over the next ten years to average 2.30%.

Based on this information we recommend decreasing the inflation assumption by 10 basis points to 2.50%. Please note that due to URS's COLA provision, there is a risk of setting the inflation assumption too low. With a larger decrease in the inflation assumption, plan benefits and costs could increase faster than expected if actual inflation is higher than assumed. As a result, we are cautious of recommending a larger decrease in the inflation assumption.

Investment and administrative expenses

The trust fund pays investment and administrative expenses from plan assets. Plan expenses may be explicitly assumed as a direct increase to the annual normal cost or implicitly assumed by developing an investment return assumption as a net return after payment of plan expenses. Given the relatively small size of administrative expenses compared to plan assets (i.e. approximately 5 basis points), we believe the development of an investment return assumption net of administrative expenses remains reasonable.

The Retirement System also incurs investment expenses. However, the forward-looking capital market assumptions and return forecasts developed by investment consulting firms already reflect expected investment expenses. Their return estimates for core investments (i.e., fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds that are net of investment related fees. Investment return expectations for the alternative asset class such as private equity and hedge funds are also net of investment expenses. Therefore, we did not make any additional adjustments to account for investment related expenses.

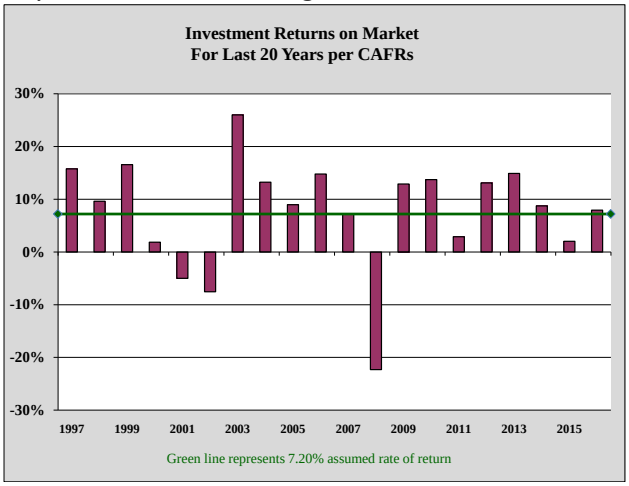
URS also utilizes some active management investment strategies that result in higher investment expenses compared to strategies that invest in passive index funds. We have assumed that those active management strategies would result in the same returns, net of investment expenses, as passive management strategies. Historically, URS's active management strategies have resulted in additional investment returns in excess of these additional investment expenses. However, our analysis will not advance recognize an excess return attributable to URS's active management activity.

Investment Return Rate

The investment return assumption is one of the principal assumptions in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date, in order to determine the liabilities of the plans. Even a small change to this assumption can produce significant changes to the liabilities and contribution rates.

Currently, we assume that future investment returns will average 7.20% per year, net of investment and administrative expenses. This is the rate used to discount future payments in calculating the actuarial present value of those payments. The current assumption assumes inflation of 2.60% per annum and an annual real rate of return of 4.60%, net of expenses.

The following chart shows the year-by-year returns for the last twenty fiscal years for URS, taken from the URS CAFRs. The first 17 years of the chart are gross returns and the last three years are net.



Source: Data from Utah Retirement Systems' Comprehensive Annual Financial Reports

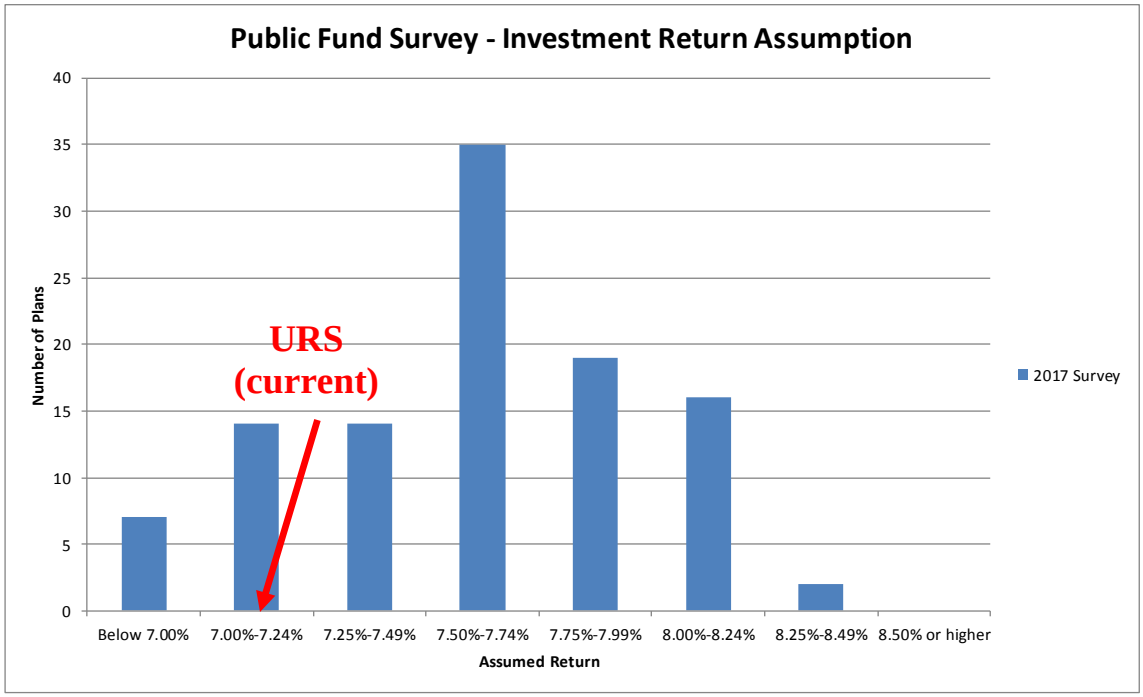
Analysis of Experience and Recommendations

The table below shows the average URS market returns (reduced for expenses) for various periods as calculated by GRS. These returns are determined on a dollar-weighted basis and can differ from the time-weighted basis used by URS.

Average URS Returns for Various Periods	
Last 5 Years	8.8%
Last 10 Years	5.1%
Last 15 Years	6.8%
Last 20 Years	6.9%

However, for this assumption, past performance is not a reliable indicator of future performance, even when averaged over a twenty-five year period. The actual asset allocation of the trust fund will significantly impact the overall performance, so returns achieved under a different allocation are not meaningful.

The Public Funds survey shows that the median investment return assumption for large public plans is 7.50%. This survey median has decreased from 7.75% in the same survey conducted in the last experience study. While we do not recommend the Board select an assumption based on prevalence information, it is still informative to see where URS is compared to its peers. Here is a chart showing the distribution of the investment return assumptions in the Public Funds Survey:



Source: Public Funds Survey (n=126) adjusted for known changes. Median investment return assumption: 7.50% nominal return.

Analysis of Experience and Recommendations

We believe a more appropriate approach to selecting an investment return assumption is to determine the median expected portfolio return given the fund's target allocation and a given set of capital market assumptions. Since we are not investment professionals, we look at the results under various sets of capital market assumptions used by several major investment consulting firms. Per the investment policy disclosed in the 2016 CAFR, URS's current target asset allocation is:

Asset Category	Target Allocation
Equities (Domestic and International)	40%
Debt Securities	20%
Real Assets	15%
Private Equity	9%
Absolute Return	16%
Cash	0%
Total	100%

Because GRS is a benefits consulting firm and does not develop or maintain our own capital market assumptions, we reviewed forward-looking assumptions developed by Callan Associates, URS's Investment Consultant, as well as the following other investment consulting firms:

<u>10-Yr Assumptions Sets</u>

- BNY Mellon
- JP Morgan
- Marquette
- RV Kuhns

<u>20-30 Year Assumption Sets</u>

- Aon Hewitt
- Mercer Consulting
- NEPC
- Principal

These investment consulting firms periodically issue reports that describe their capital market assumptions, that is, their estimates of expected returns, volatility, and correlations. While these assumptions are developed based upon historical analysis, many of these firms also incorporate forward looking adjustments to better reflect near-term expectations. The estimates for core investments (i.e. fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds. The investment return expectations for the alternative asset classes, such as private equity and hedge funds are also net of investment expenses. Therefore, as mentioned previously, we are not required to make any additional adjustments to account for investment expenses.

It is also important to understand the forecast time horizon for each of the investment consultant assumptions. While the use of short-term capital market assumptions may be useful for monitoring their investment strategies and making tactical asset decisions, these assumptions are not reasonable for use in selecting a long-term investment return assumption for use in the actuarial valuation.

Analysis of Experience and Recommendations

The table below provides the 40th, 50th, and 60th percentiles of the geometric average of the expected nominal return, net of expenses for the four firms with a 10-year horizon on their capital market assumptions. In addition we show the probability of exceeding the current 7.20% assumption.

Expected Annual Geometric Returns and Return Probabilities (Based on 10-Year Capital Market Assumptions)

Investment Consultant	Distribution of Average Geometric Net Nominal Return			Probability of exceeding
	40th	50th	60th	7.20%
(1)	(2)	(3)	(4)	(5)
Callan	5.5%	6.3%	7.0%	38%
1	5.4%	5.9%	6.4%	27%
2	5.4%	6.0%	6.6%	29%
3	5.4%	6.1%	6.7%	33%
4	6.5%	7.1%	7.6%	48%
Average	**5.6%**	**6.3%**	**6.9%**	**35%**

On the other hand, the investment return assumption used in the actuarial valuation has a significantly longer investment horizon. Therefore, it is necessary to identify and reflect differences in economic and financial market expectations over the short-term and long-term time horizon. The table below provides the same information based on the capital market assumptions for the four firms who developed capital market expectations for a 20 to 30 year time-horizon.

Expected Annual Geometric Returns and Return Probabilities (Based on 20-30 Year Capital Market Assumptions)

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding
	40th	50th	60th	7.20%
(1)	(2)	(3)	(4)	(5)
5	6.2%	6.7%	7.3%	42%
6	6.4%	7.0%	7.6%	46%
7	6.4%	7.1%	7.8%	48%
8	7.1%	7.7%	8.3%	58%
Average	**6.5%**	**7.1%**	**7.8%**	**49%**

Recommendation

The average of the four 20-30 year capital market assumptions show there is an approximate 50% probability of meeting the current 7.20% investment return assumption. Given the financial condition of the retirement system, we believe that the 20-30 year capital market assumptions are reasonable for selecting an investment return assumption that satisfies the best-estimate assumption requirement under ASOP No. 27.

However, given the average of the 10-year capital market assumptions show the probability of attaining a 7.20% is 35%. We recommend the Board decrease the investment return assumption to at least 7.00%, with 6.95% or 6.90% as other possible assumptions. Decreasing the investment return assumption to 7.00% would increase the probability of attaining the assumed rate of return to 38% over the next 10 years (based on the average of the 10 year capital market assumptions) and to 52% over the next 20 to 30 years (based on the average of the 20 to 20 year capital market assumptions). A 6.95% or a 6.90% return assumption would increase the probability of meeting or exceeding the investment return by an additional 1% to 2% (compared to a 7.00% return assumption).

Given uncertainty regarding future investment experience, we also recommend the Board consider adopting an investment return assumption that is slightly less than 7.00%. While a slightly lower investment return assumption does not significantly change the probability of exceeding the return assumption in future years, a slightly return assumption will result is slightly lower investment losses in years when the actual investment return is less than assumed rate of return.

Cost-of-living increase assumption

All annuitants in URS receive an automatic cost-of-living adjustment (COLA) each year. For members of the Tier I Public Employees Retirement Systems, the COLA is equal to the annual percentage increase in the CPI, subject to a maximum of 4.00%, multiplied by the original retirement benefit amount. That is, it is a simple interest increase, not a compounded increase. The other systems have similar COLAs, although some Tier I Public Safety units/funds have a 2.50% maximum rather than a 4.00% maximum, both of the Tier II plans have a 2.50% maximum, and Judges receive a compounded COLA with a 4.00% maximum, rather than a simple interest increase.

The COLAs in URS all have a catch-up feature, so that if COLAs are capped by the maximum, a bank is established for the member with the amount of the increase that could not be given, and in the next year that inflation is below the plan's maximum COLA, the member can receive part or all of the bank, in addition to the regular COLA, up to the applicable maximum increase. Because of this "catch-up" design, the assumption for future COLAs should be equal to the price inflation assumption, subject to the maximum for the System.

Since we are recommending a 10 basis point decrease in the price inflation assumption, we recommend the use of a 2.50% COLA assumption for all of the funds.

Analysis of Experience and Recommendations

Salary increase rates - general

In order to project future benefits, the actuary must project future salary increases. Employee salaries increase due to a variety of reasons:

- Across-the-board increases for all employees;
- Across-the-board increases for a given group of employees;
- Increases to a minimum salary schedule;
- Additional pay for additional duties;
- Step or service-related increases;
- Increases for acquisition of advanced degrees or specialized training;
- Promotions; or
- Merit increases, if available.

The salary increase assumption used in the actuarial valuation is meant to reflect all of these types of increases, since all of these affect the salaries used in benefit calculations and upon which contributions are made.

An actuary should not look at the overall increases in payroll in setting this assumption, because payroll can grow at a rate different from the average pay increase for individual members. There are two reasons for this. First, when older, longer-service employees terminate, retire or die, they are generally replaced with new employees who have a lower salary. Because of this, in most populations that are not growing in size, the growth in total payroll is smaller than the average pay increase for members. Second, payroll can change due to an increase or decrease in the size of the group. Therefore, to analyze salary increases, we examine the actual increases for individuals.

We analyzed the salary increases based on the change in the member's reported pay from one year to the next. That is, we looked at each member who appeared as an active member in two consecutive valuations—these are called continuing members—and measured his/her salary increase.

Salary increases for governmental employees can vary significantly from year to year. When the employer's tax revenues stall or increase slowly, salary increases often are small or nonexistent. During good times, salary increases can be larger. Our experience across many governmental plans also shows many occasions in which salary increases will be low for a period of several years followed by a significant increase in one year. Therefore, for this assumption in particular, we prefer to use data over a longer period in establishing our assumptions. We used a ten-year period to analyze this assumption.

Analysis of Experience and Recommendations

Below is a table showing the average increase given to continuing members by year for members in various groups:

Year	State	Teachers	Local	Public Safety	Firefighters
2007	7.8%	9.8%	7.1%	7.7%	6.8%
2008	6.9%	7.4%	6.8%	7.5%	6.4%
2009	2.9%	3.9%	3.4%	4.0%	4.0%
2010	1.4%	1.2%	1.4%	0.8%	2.1%
2011	2.3%	3.2%	2.7%	2.3%	2.5%
2012	2.7%	2.5%	3.0%	2.6%	2.7%
2013	3.0%	3.4%	3.9%	3.4%	3.4%
2014	3.4%	3.7%	3.7%	3.9%	3.7%
2015	4.6%	4.5%	4.6%	4.6%	4.7%
2016	4.8%	6.0%	4.6%	5.4%	5.1%
Average	4.0%	4.6%	4.1%	4.2%	4.1%

The average increase for continuing judges over this period was 2.5%. No salary increase assumption is set for the Legislative and Governors Plan, since neither benefits nor contributions are salary-related.

The salary assumption can be thought of as consisting of wage inflation (that part of the pay increase which is given to all employees) and an additional component to reflect step increases and other increases correlated with service. Most actuaries recommend salary increase assumptions that include an element that depends on the member's age or service, especially for large, public retirement systems. It is typical to assume larger pay increases for younger or shorter-service employees. The experience shows salaries have been more closely correlated to service rather than age, as promotions and productivity increases tend to be greater in the first few years of a career, even if the new employee is older than the average new hire.

Our current assumptions follow this pattern for all groups other than judges (whose pays are set by position, and are unrelated to time on the bench). Therefore, we divide the task of setting the salary increase into two pieces:

1. Determining the assumption for long-service employees (wage inflation)
2. Determining the additional increases to be applied to shorter-service employees

The next two subsections will discuss these components of the salary assumption.

Analysis of Experience and Recommendations

Wage inflation

Many of the factors that result in pay increases are largely inapplicable or have diminished importance for longer-service employees. Step or service-related increases have stopped or are minimal. Promotions occur with less frequency. Additional training or acquisition of advanced degrees usually occurs early in the career. In theory, then, salary increases for longer-service employees are almost entirely driven by wage inflation. Wage inflation is the increase in the average wage of all members of the workforce. The current wage inflation assumption for all groups in URS is 3.35%.

Historically, wage inflation almost always exceeds price inflation. This is because wage inflation is in theory the result of (a) price inflation, and (b) productivity gains being passed through to wages. The current 3.35% assumption can be thought of as comprised of (a) a 2.60% inflation rate, plus (b) an additional 0.75% for productivity gains. For the last twenty-five years ending in 2015, for the economy as a whole, wage inflation has outpaced price inflation by about 1.0% as measured by the difference between increases in the National Average Wage (a statistic used by the Social Security Administration) and increases in the Consumer Price Index. This is not significantly different than the average rate of wage inflation since 1951. However, one cannot ignore the decline in wage inflation during the last fifteen years. For instance, wage inflation has exceeded price inflation by about 0.65% per year over the last 15 years.

The Social Security intermediate assumption set assumes wage inflation of 3.8% (2.6% price inflation plus an additional 1.2%).

When we look at URS experience for members with 25 or more years, we find that over the last ten years, their increases have averaged as follows:

Group	Average Salary Increase	Price Inflation	Difference
Teachers	2.30%	1.81%	0.49%
State	2.56%	1.81%	0.75%
Local Government	2.67%	1.81%	0.86%
Public Safety	2.68%	1.81%	0.87%
Firefighters	2.08%	1.81%	0.27%

As you can see, pay increases for long-service employees over the last 10 years were approximately 0.5% to 0.9% over inflation for teachers, state and local government employees as well as public safety members. However, during this same time period, average pay increases for long service firefighters has been about 0.3% more than increases in CPI. Note, this difference in the 10-year averages are approximately 0.3% to 0.6% more than the 10-year average differences observed in the last experience study performed in 2014. This means that the wage inflation during the years 2004 through 2006 were lower than the wage inflation employees experienced in the years 2014 through 2016.

Analysis of Experience and Recommendations

Based on this experience, there is still significant evidence salary increases for long-term employees exceed inflation during the last 10-years. Therefore, we recommend that the wage inflation assumption for URS be set at 3.25% (2.50% price inflation plus 0.75% productivity increase). This means that the productivity increase assumption will remain unchanged from the prior year.
For Judges, who do not have assumed step increases, we propose to decrease maintain the current 0.75% productivity increase, which will decrease the ultimate annual salary increase assumption from 3.35% to 3.25% (i.e. 2.50% price inflation plus a 0.75% wage inflation and merit increase).

Salary increase assumptions for shorter-service employees (step increases)

To analyze the service-related salary assumption, we looked at the excess in the average increases for shorter-service employees over the average for longer-service employees. For example, teachers with four years of service received an average increase of 6.14%, which was 3.84% more than the average increase of 2.30% for teachers with twenty-five or more years of service.

We then determined new service-related assumptions reflecting this data. For instance, in the example above, the step for a teacher entering her fifth year under the current assumption is 4.50%.

Salary increase assumptions (overall)

The overall effect of the changes to the wage inflation assumption and to the step increases was to decrease the average increase for each group.

Here is a table showing the average increases, in excess of inflation, for continuing members for the last ten years, compared to the average expected increases in excess of inflation under the current and proposed assumptions:

Group	Actual Increase	Actual Inflation	Salary Increase over Inflation		
			Actual[1]	Current[2]	Proposed[3]
State Employees	3.96%	1.81%	2.15%	2.12%	2.12%
Teachers	4.53%	1.81%	2.72%	3.19%	2.95%
Local Gov't.	4.11%	1.81%	2.30%	2.32%	2.12%
Public Safety	4.20%	1.81%	2.39%	2.39%	2.31%
Firefighters	4.13%	1.81%	2.32%	3.10%	2.96%

[1] The actual salary increase in excess of inflation for all continuing active members during the 10-year observation period.
[2] The expected average increase in salary in excess of the current 2.60% assumed rate of inflation.
[3] The expected average increase in salary in excess of the proposed 2.50% assumed rate of inflation. The proposed assumption reflects a 10 basis point reduction due to a decrease in the inflation assumption.

More detail is shown on the tables in Section F. See pages 93-97.

Analysis of Experience and Recommendations

Payroll growth rate

The salary increase rates discussed above are assumptions applied to individuals and are used in projecting future benefits. The amortization payments are calculated to be a level percentage of total payroll. Therefore, as payroll increases over time, the amortization payments do as well. Therefore, we use a separate payroll growth assumption (currently 3.35% annually) in determining the annual payment to amortize the unfunded actuarial accrued liability.

Payroll can grow at a rate different from the average pay increase for individual members. There are two reasons for this. First, when older, longer-service members terminate, retire or die, they are generally replaced with new members who have a lower salary. Because of this, in most populations that are not growing in size, the growth in total payroll will be smaller than the average pay increase for members. Second, payroll can grow due to an increase in the size of the group. However, we do not currently assume membership growth in setting the payroll growth assumption.

The following chart shows the average annual payroll growth for URS as a whole, the average annual active membership growth, and the net payroll growth not due to membership growth.

Average Annual Payroll and Membership Increase Rates			
Period	Payroll	Membership	Net
Last 5 Years	2.72%	-0.10%	2.82%
Last 10 Years	2.95%	0.27%	2.68%
Last 15 Years	3.02%	0.47%	2.55%
Last 20 Years	3.81%	0.95%	2.86%

The financial crisis in 2008 and 2009 put a considerable fiscal strain on states and local governments. Across the country, governmental employers were forced to decrease their employee workforce and depress salary increases to remaining employees. This effect is clearly evident in URS's experience. Note, while payroll growth, adjusted for change in membership, was 2.86% over the last 20 years, actual inflation was also lower than assumed (2.12% actual versus 2.60% assumed). If we assume that the last 20-years was representative of the next 20 years, which coincides with the Board's funding period, and adjust the experience for the difference in inflation then we would expect payroll growth to be 3.34% (i.e. 2.86% + (2.60% - 2.12%)).

Also, in theory, payroll growth in the absence of membership growth should approximate the wage inflation assumption (proposed to be 3.25%). However, long-term projections that do not anticipate membership growth show that payroll is actually expected to grow more slowly over the next 20 years as baby boomers retire and are replaced by younger members with lower salaries.

Based on this information, and including the historical growth in membership, we are recommending setting this assumption at 3.00%, a 10 basis point decrease from the current assumption.

Analysis of Experience and Recommendations

DEMOGRAPHIC ASSUMPTIONS

Actuaries are guided by the Actuarial Standards of Practice (ASOP) adopted by the Actuarial Standards Board (ASB). One of these standards is ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This standard provides guidance to actuaries giving advice on selecting noneconomic assumptions for measuring obligations under defined benefit plans. We believe the recommended assumptions in this report were developed in compliance with this standard.

Post-retirement mortality rates (non-disabled)

URS's actuarial liabilities depend in part on how long retirees live. If members live longer, benefits will be paid for a longer period of time, and the liability will be larger.

The current assumption uses separate mortality tables based on gender and for educators and noneducators. We use different tables for educators because our studies have consistently shown that they live longer on average than other state and local government employees. Mortality experience for public safety members and firefighters are not materially different than state and local government employees.

The current base mortality assumptions are summarized below, and then projected forward based on projection Scale AA from the year 2000. The current mortality assumption has been in effect since the year 2011 and has only required a slight change in the multiplier for female teachers.

State and local government as well as public safety and firefighter retirees

- Male: RP-2000 Combined mortality table with white collar adjustment
- Female: the URS teacher mortality table for females multiplied by 120%

Retired educators

- Male: URS teacher mortality table for males multiplied by 90%
- Female: URS teacher mortality table for females multiplied by 100%

When the last experience study was performed in 2014, the Society of Actuaries' Retirement Plans Experience Committee's (RPEC) had just released a report with more current nationally based mortality tables and improvement assumptions, referred to as RP-2014 (based mortality table) and MP-2014 (improvement assumption). RPEC has also released annual updated to the MP-2014 improvement assumptions, referred to as MP-2015 and MP-2016 to reflect more recent mortality experience.

Analysis of Credibility of the Retirement Systems' Mortality Experience

When selecting an appropriate mortality assumption, actuaries often use standard, published, mortality tables. As the size of the retiree population increases, actuaries often also adjust these published mortality tables with multipliers or age setbacks, to better reflect characteristics of the covered group, and to provide for expectations of future mortality improvement (both up to and after the measurement date). On the other hand, a retirement system with a sufficiently large number of

retirees may be able best model mortality experience using mortality table based on their experience. Factors that may be considered in selecting and/or adjusting a mortality table include the demographics of the retiree group, the number of retirees in the system, the statistical credibility of its experience, and the anticipated rate of future mortality improvement.

In our analysis of the mortality experience for the Utah Retirement Systems, we first measured the credibility of the dataset to determine whether standard published tables should be used or if a statistical analysis of the Retirement Systems' data was warranted. Based on a practice note issued by the American Academy of Actuaries in June 2015, a dataset needs 96 expected deaths for each gender to be within +/- 20% of the actual pattern with 95% confidence. However, we believe a +/- 20% range to too large to be considered fully credible, for mortality section. Other sources suggest higher requirements, such as 1,000 deaths per gender is necessary to be considered fully credible. The following table gives the number of deaths needed by gender to have a given level of confidence that the data is +/- X% of the actual pattern.

Standard Score	Confidence	99% – 101%	97% – 103%	95% – 105%	90% – 110%	80% – 120%
0.674	75%	4,543	505	182	45	11
1.282	80%	16,435	1,826	657	164	41
1.645	90%	27,060	3,007	1,082	271	68
1.96	95%	38,416	4,268	1,537	384	96
2.576	99%	66,358	7,373	2,654	664	166

Using this information, 1,082 deaths are needed by gender to have 90% confidence that the data is within +/- 5% of the actual pattern. The Utah Retirement Systems (all funds combined) had 3,283 male deaths and 3,689 female deaths during the five-year period ending December 31, 2016. Based on the statistical credibility table, we are 99% confident that we are between 3% and 5% of the true mortality experience for males and females, respectively.

Note, we intentionally used a five-year period for this analysis because while the use of more years of experience would provide more data (and higher credibility), the additional years of experience would temper real changes that have occurred in the mortality assumption due to improvements in life expectancy during the time period.

There are also reasons beyond statistical credibility to determine whether a published table based on national population or a System specific mortality table should be used. Studies on mortality consistently show that longevity can vary significantly among industries, ethnicity, education, and geographic location. For instance, people with formal education beyond high school or a profession degree have a longer life expectancy than people without a formal education beyond high school. However, a Morbidity and Mortality Report issued by the Center for Disease Control on July 19, 2013, states that Utah ranks 9th in life expectancy compared to people in the other US States. Due to this large variation in mortality experience, it is unlikely that a nationally published table provides a good fit across the entire age spectrum of the URS retiree population.

As a result, we concluded it is appropriate to utilize the Retirement System's experience and develop a System specific mortality assumption. Using a system specific mortality assumption will reduce the risk of undervaluing or overvaluing liabilities, provide better future estimates of liabilities and projected benefit payments.

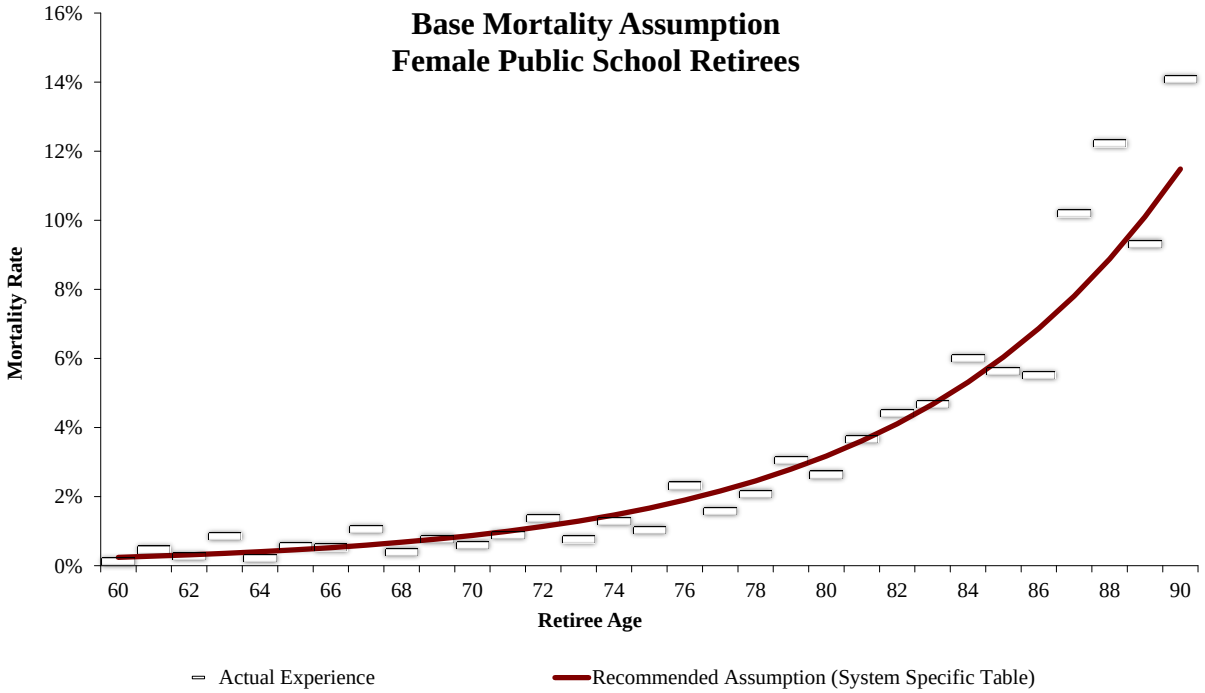
Recommended Base Mortality Assumption

We performed our analysis using a benefit weighted approach, where we measure the exposures and actual deaths as the retiree's benefit amount, rather than a headcount approach that applies an equal weighting to all retirees. Developing a base table with using a benefit weighted approach is preferable because: (1) research studies have consistently shown that higher wage earners generally have a longer life expectancy than lower wage earners and (2) this approach should better model the actual liability that is released when retirees die. Furthermore, a benefit weighted approach is the same method used by the RPEC when they develop published mortality tables.

Mortality rates for the core ages of retirees, beyond age 60, are based on the Retirement System's experience, using an exponential model to provide a smooth fit to the midpoint of the experience. Mortality rates for the outlier ages, ages under 50 and ages over 106, are equal to a the most recently published RP-2014 mortality assumptions (adjusted back to the central point of the experience period using projection scale MP-2014). Finally, the mortality rates for the transitional age ranges, ages 50 to 59, and 96 to 105, were developed using a 10-year blending method to orderly transition between the mortality rates between the core and outlier age ranges.

The final step in the creation of the base mortality assumption was to project the preliminary table from the center point of the analysis period (i.e., the year 2013) to the year 2017 using a mortality improvement assumption. We will refer to this new table as the 2017 Public Retirees of Utah Mortality Table (2017 PR UTAH).

The following is a chart that shows the actual mortality experience assumption for female public school employees, the largest group in the System.



Recommended Mortality Improvement Assumption

RPEC recognizes that there is a wide range of opinion with respect to future levels of mortality and that the assumptions underlying mortality improvement reflect some degree of subjectivity. Generational mortality improvement Scale AA will released by the Society of Actuaries along with the release of the RP-2000 mortality tables. In September 2012, RPEC released Generational Scale BB that provides a higher mortality improvement assumption as an alternative to the Scale AA assumption. RPEC has also issued mortality improvement assumptions Scale MP-2014, Scale MP-2015, and Scale MP-2016 in 2014, 2015, and 2016 respectively.

As we previously mentioned, the current mortality assumption has been in place since performing the 2011 actuarial valuation. This is also the second experience study subsequent to having this mortality assumption in place. Based on the observations in the 2011, 2014, and 2017 experience studies, we have found that mortality improvement assumption Scale AA has been appropriate in modeling the actual improvement in life expectancy for URS retirees during this observation period. This is what is shown in the detailed tables in Section F, pages 39-44. Given this information, we are recommending a new base table that is based on the Retirement System's experience and continued use of improvement Scale AA.

Recommended Non-Disabled Mortality Assumption

Finally, in order to provide a better fit to the differences in expected life expectancies for the different employee groups, we have applied multipliers to the base table. Below are the specific mortality assumptions:

Educators:
Males: 2017 PR UTAH for Males multiplied by 90%
Females: 2017 PR UTAH for Females multiplied by 90%

Non-educators:
Males: 2017 PR UTAH for Males multiplied by 110%
Females: 2017 PR UTAH for Females multiplied by 110%

The mortality assumption will improve using projection Scale AA from the year 2017.

Below is a table summarizing the life expectancy for a member who retires at age 65 in future years based on the recommended assumptions.

Life Expectancy (in Years) under Recommended Assumptions for an Age 65 Retiree					
Employee Group	Year Reaching Age 65				
	2020	**2025**	**2030**	**2035**	**2040**
Male Educators	22.4	22.8	23.1	23.4	23.7
Female Educators	23.5	23.7	23.9	24.1	24.2
Male Noneducators	21.0	21.3	21.6	22.0	22.3
Female Noneducators	22.1	22.3	22.5	22.6	22.8

To document for completeness, the mortality assumption used in the valuation of the Judicial Retirement System will use the same mortality assumption as that used for educators.

Disabled retiree mortality rates

This is a relatively minor assumption, compared to the mortality assumption for non-disabled retirees, and it has minor impact on the liabilities of URS. Because of the small numbers of disabled retirees and disabled deaths, we combined all the disabled lives for our analysis. The valuation currently uses the RP-2000 Mortality Table for disabled annuitants (separate tables for males and females with the female mortality assumption adjusted with a 110% multiplier), and the generational improvement assumption Scale AA to project future improvements in mortality. Thus, mortality improvement will be projected consistently for both non-disabled and disabled retirees in the valuation.

Based on the current experience (on a benefit weighted basis), the A/E ratio for males and females was 101% and 121%, respectively. We reviewed alternative assumptions and found the 2014 RP-2014 Mortality Table for Disabled Retirees with a base year of 2006 and projected forward at Scale AA provides an improved fit. As a result, we recommend using this updated table with a 110% multiplier applied to the male assumption and a 120% multiplier applied to the female table. These

recommended mortality assumptions also have the improvement Scale AA applied for all future years after the base year of 2006.

More detail is shown on the table on pages 45-46 in Section F.

Active mortality

This is the least significant of all the mortality assumptions. Given the lack of credible mortality data for employees and the availability of more current mortality assumption tables, we recommend updating the mortality assumption to use the RP-2014 Mortality for Employees with a white-collar adjustment, with an 80% multiplier applied to male educators and an 50% multiplier applied to female educators. We also recommend use of an 80% multiplier to the assumption for female state and local government employees.

More detail is shown on the tables on pages 47-56 in Section F.

Disability incidence

The disability rates are intended to reflect the probability that a member will retire with a disability pension (Firefighters) or go onto LTD (the Public Employee and Public Safety systems). Members eligible for the 30-and-out (35-and-out in Tier II) retirement benefit in the Public Employees Systems or the 20-and-out (25-and-out in Tier II) retirement benefits in the Public Safety and Firefighter systems are not eligible for a disability benefit. We analyzed disability separately for males and females, general state employees, general local government employees, teachers, public safety employees, and firefighters. For Public Safety and Firefighters, because of the small number of females, we combined the males and females to increase the credibility of the experience.

Again we compared the number of actual and expected disabilities by group. For this assumption, an A/E ratio less than 100% is conservative.

The overall A/E based on the current assumptions was 73% (812 new disabilities during the study period vs. 1,117 expected). In reviewing the results for the different membership groups, we find that some of them need a slight adjustment to decrease the number of expected disabilities. The shape of the current assumption continues to provide an adequate fit, and only a change in the multiplier to the rates is necessary. There was no change to the assumption for male and female teachers. In the case of State Employees, the multiplier for the male and female assumption was reduced from 115% to 100% and from 100% to 85% respectively, which increased the A/E ratios from 73% to 84% for males and from 74% to 88% for females. The multipliers applied to the assumption for local government employees were also modified to be equal to that used by State employees. This increased the A/E ratio from 67% to 78% for males and from 59% to 69% for females. Similarly, the multiplier applied to the public safety assumption was decreased from 150% to 120%. Finally, the multiplier applied to the firefighter assumption was increased from 180% to 210% (it appears the reduction firefighter disability rates in the prior study were a little too steep).

More detail is shown on the tables on pages 57-64 in Section F.

Analysis of Experience and Recommendations

Retirement

The retirement rates are only applied to members eligible for retirement. Separate rates are set for the various systems and employee groups: state employees, teachers, local government employees, public safety, firefighters, judges and legislators. For most groups, separate rates are set for males and females. The valuation currently uses retirement rates that vary by age and service. For unreduced retirement, an A/E ratio under 100% is desirable for conservatism.

Before discussing the experience, we will remind readers that the Legislature had substantially reduced the ability for members who retire from URS after July 1, 2010 to concurrently receive their retirement benefit and be employed with a participating employer of URS. As a result, we have had substantial reduction in the retirement rates in prior studies. However, it appears the System may have reached the threshold at which further significant reductions are no longer warranted. We are recommending changes for some of the groups but these are small changes to better fit the experience. Some of the changes are even increases in the rates.

We are recommending the following changes in retirement rates.

The chart, below, shows the actual retirements as well the expected retirements under the current and proposed assumptions (reduced retirement and unreduced retirement combined) for the various membership groups:

Group	Actual Retirements	Expected Current Assumption	Expected Proposed Assumption
Educators - males	940	1,015	1,070
Educators - females	2,866	3,099	3,234
State - males	2,051	2,723	2,705
State – females	3,968	4,597	4,718
Local - males	1,206	1,486	1,451
Local - females	1,187	1,362	1,408
Public Safety	1,032	1,228	1,205
Firefighters	178	210	206
Judges	23	42	37
Total – All Systems	13,451	15,763	16,034

Analysis of Experience and Recommendations

As you are aware there is very little retirement experience for the Tier II Hybrid Retirement Systems. The current rates were developed based on prior experience with Tier I with some adjustments for pent up demand because the retirement eligibilities and benefit provisions for the Tier II are less generous and slightly more restrictive. We are proposing to continue to use the current Tier II retirement rates until experience develops for this group. Please note that all of the retirement rates are based on our professional judgment about the future retirement behavior for members in the new Tier II retirement program since no experience will be available for many years.

Section F provides more detail about the actual and expected number of retirements. See pages 73-92.

Termination rates

Termination rates reflect members who leave for any reason other than death, disability or service retirement. They apply whether the termination is voluntary or involuntary, whether the member is vested or non-vested, and whether the member takes a refund (in the contributory systems) or keeps his/her account balance on deposit and takes a deferred benefit.

The valuation uses separate termination rates for males and females and for the various employee groups: general state employees, teachers, general local government employees, public safety, and firefighters. The current rates are structured as a function of service. No terminations are assumed once a member becomes eligible for retirement. The current tables were based on prior URS experience. An A/E ratio above 100% is considered conservative.

Our analysis showed for most of the groups that the expected number of terminations were less than the actual experience. However, this is where we prefer this assumption. It is conservative to have more terminations than expected. We generally prefer at least a 10% margin between the actual number of expected terminations and the actual number of terminations. We made minor changes to the assumptions for most groups with the exception of Public Safety which were not changed.

Analysis of Experience and Recommendations

Below is a summary of the results for the systems.

Group	Actual Terminations	Expected Current Assumption	Expected Proposed Assumption
Educators - males	1,687	1,371	1,340
Educators - females	6,986	6,296	5,906
State - males	5,622	5,032	4,830
State - females	11,660	10,003	10,175
Local - males	3,153	2,762	2,672
Local - females	4,057	3,312	3,402
Public Safety	1,351	1,154	1,154
Firefighters	170	127	155
Total – All Systems	34,686	30,057	29,634

Using the proposed assumptions, the A/E ratios now range from 110% to 120% for most of the groups.

We assume no turnover for judges, and in fact, in most years no judges leave the bench.

For the Legislative/Governor group during the last five year period, with the exception of the turnover in 2012/2013 due to the election, year-to-year turnover has been very low (less than 5%). Most legislators that leave appear to be retiring. We are not recommending any changes to the current 10% turnover assumption.

More detail is shown on the tables on pages 65-72 in Section F.

Marriage Assumption

The marriage assumption is a minor one for URS. We currently assume 100% of the members are married at death, and that there are no children or other beneficiaries who will receive benefits. While we recognize that this is conservative, we did review the retiree data to identify the percentage of new retirees that had a married indicator and spousal date of birth and concluded that this assumption is not unreasonable. Therefore, we recommend making no change at this time. (Recognize that this assumption only affects some of the death and survivor benefits, particularly in the Public Safety and Firefighters Systems.)

Spousal age difference

Currently, we assume that male members are three years older than their spouses and female members are three years younger than their spouses. Based on a review of the spousal age difference at the time of the member's retirement shows that male members are, on average, three years older than their spouses, female members are, on average, two years younger than their spouses. The

Analysis of Experience and Recommendations

Retirement System's experience is not materially different than the national general census statistics of a three year spousal age difference. Therefore, this assumption continues to be reasonable and we are not recommending changes.

Refund of contributions

We currently assume that a percentage of terminating members who participate in one of the contributory plans will take a refund, rather than leaving their funds on deposit with URS. The percentages grades down from 100% for all nonvested members to 0% after 20 years of service. Because most members participate in one of the noncontributory systems, and because the termination rates in the Public Safety and Firefighters systems are very low, this assumption has little effect on the results. We are recommending no change in the tables of refund percentages.

Other assumptions

There are other technical assumptions made in the course of a valuation, such as the timing of terminations and retirements during the year, and the timing of pay increases. We reviewed these and are recommending no changes.

Actuarial cost method

The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the Fund. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year. It allocates costs among various generations of taxpayers in a reasonable fashion. It is by far the most commonly used actuarial cost method for large public retirement systems. It is also the one actuarial cost method that the Governmental Accounting Standards Board has approved for use under the new pension accounting standards. We continue to believe this is the best funding method for URS, and we recommend no change.

Actuarial Value of Assets

Actuaries generally recommend using a smoothed actuarial value of assets (AVA), rather than market value (MVA), in order to dampen the fluctuations in measurements such as the required contribution amount and the funded status of the system.

The current method smooths the difference between the expected return (based on the recommended 7.00% annual investment return assumption) and actual returns, net of expenses, over a five-year period. For example, if the actual return is 12.00% in one year, then 7.00% is reflected immediately in the AVA, and the other 5.00% is recognized in 20% increments over five years, beginning with 20% for the current year. Additionally, this method requires that the actuarial value of assets be no more than 125% of the market value and no less than 75% of the market value. This keeps the actuarial value from drifting to far from the underlying market value in an extended boom or downturn.

This method of determining the actuarial value of assets is very common. While some plans use a shorter or longer smoothing period, five years is by far the most common period being used by public sector plans. We believe this method is reasonable. We do not believe the method has a bias relative to market. In other words, we expect the ratio of the AVA to MVA to average about 100% over the very long term.

Amortization period

The Board's current funding policy includes the following financial objectives:

- To maintain a stable or increasing funded ratio;
- To accumulate sufficient assets to finance the benefits promised to members and beneficiaries;
- To sustain a pattern of relatively constant contribution rates expressed as a percentage of member salary;
- To provided intergenerational equity for taxpayers with respect to system costs;
- To manage investment risk with a diversified asset allocation and asset smoothing;
- To require employers to contribute the greater of the actuarial calculated contribution rate or the previous year's contribution rate until the Systems reach a 110% funded ratio. Once a 110% funded ratio is attained, the employer contribution rate shall be adjusted such that it is sufficient to maintain a 100% funded ratio.

The current Board policy (except the Governors and Legislators Pension Plan) is to have the calculated contribution rates determined using an open 20-year amortization period. Section of 49-11-301(5) of the Utah Code gives the Board the option of setting contribution rates at the higher of the previous year's certified rate and the current year's actuarially calculated contribution rate. Therefore, the actuarially calculated rate, becomes the contribution rate floor and the amortization period used to calculate the actuarially determined rate becomes the maximum funding period. Stated differently, if the certified contribution rate is greater than the actuarially determined rate then the number of years until the plan attains a 100% funded ratio will be less than the amortization period used to determine the actuarially determined contribution rate.

The combination of developing an actuarially determined contribution rate with a 20-year funding period and continuing to maintain the current contribution rate, if greater, is expected to result in contribution rates that will meet the Board's financial objectives.

Since the Governors and Legislators Pension Plan is funded by periodic direct appropriations rather than through pay-period contributions, we recommend continuing to use a closed amortization period for the next three years and reevaluate the amortization policy during the next experience study.

SECTION D

ACTUARIAL IMPACT OF RECOMMENDATIONS

Actuarial Impact of Recommendations

We believe the Board's decision about whether or not to adopt our recommendations should be based on the appropriateness of each recommendation individually, not on their collective effect on the contribution rates or the actuarial liabilities.

The following pages have tables showing the impact of the recommended assumptions on the January 1, 2017 actuarially calculated employer contribution rates and unfunded actuarially accrued liability.

The decrease in investment return assumption increased the liabilities and calculate contribution rate for all of the funds. For informational and decision making purposes, we have included the actuarial impact if the assumed rate of return was decreased to 7.00%, as well as if the return assumption was decreased to 6.95% or 6.90%.

The contribution rates shown on the following page exclude the 401(k) contribution and the group insurance contribution on the Tier II Hybrid plans. They include the contribution for the 3% substantial substitute where applicable. These rates do not reflect any action of the Board of Trustees under U.C. §49-11-301(5) to hold employer contribution rates at the prior year's level. For firefighters and judges, the contribution rates shown are the gross rates, before applying the offsets for insurance premium tax receipts or court fees.

Actuarial Impact of Recommendations

Comparison of FY 2018 Contribution Rates with the Actuarially Determined Contribution Rates Based on the 2017 Actuarial Valuation

Fund/Division	FY 17/18 Board Certified Contribution Rates	Current Assumptions	Recommended Assumptions		
			7.00% Assumed Rate of Return	6.95% Assumed Rate of Return	6.90% Assumed Rate of Return
(1)	(2)	(3)	(4)	(5)	(6)
I. Public Employees Contributory					
A. Local Government	**14.46%**	11.46%	11.87%	12.23%	12.59%
B. State and School	**17.70%**	14.26%	15.22%	15.64%	16.08%
C. Higher Education	**17.70%**	11.07%	14.56%	14.98%	15.43%
II. Public Employees Noncontributory					
A. Local Government	**18.47%**	15.47%	15.88%	16.24%	16.60%
B. State and School	**22.19%**	18.75%	19.71%	20.13%	20.57%
C. Higher Education	**22.19%**	16.78%	19.05%	19.47%	19.92%
III. Public Safety Contributory					
A. Other Division A (2.5% COLA)	**22.75%**	17.47%	19.70%	20.37%	21.05%
B. Other Division A (4% COLA)	**24.33%**	19.37%	20.95%	21.63%	22.32%
C. Other Division B (2.5% COLA)	**22.29%**	20.73%	22.21%	22.78%	23.36%
D. Other Division B (4% COLA)	**28.95%**	18.56%	20.01%	20.72%	21.43%
IV. Public Safety Noncontributory					
A. State	**41.35%**	34.33%	35.97%	36.65%	37.35%
B. Other Division A (2.5% COLA)	**34.04%**	28.96%	31.22%	31.90%	32.59%
C. Other Division A (4% COLA)	**35.71%**	30.85%	32.49%	33.19%	33.89%
D. Salt Lake City	**46.67%**	42.05%	44.44%	45.14%	45.85%
E. Ogden	**48.68%**	44.22%	46.92%	47.66%	48.43%
F. Provo	**42.16%**	36.95%	39.15%	39.84%	40.54%
G. Logan	**41.92%**	38.47%	41.03%	41.80%	42.59%
H. Bountiful	**49.58%**	46.66%	49.62%	50.38%	51.14%
I. Other Division B (2.5% COLA)	**32.20%**	29.89%	31.67%	32.25%	32.84%
J. Other Division B (4% COLA)	**38.94%**	28.72%	30.36%	31.09%	31.82%
V. Firefighters					
A. Division A	**15.53%**	9.38%	10.57%	11.17%	11.77%
B. Division B	**18.30%**	8.41%	9.97%	10.71%	11.48%
VI. Judges	**51.91%**	43.50%	47.97%	48.67%	49.39%
VII. 3% Substantial Substitute	**0.85%**	0.61%	0.62%	0.62%	0.63%
VIII. Tier II - Hybrid Plans					
A. Public Employees	**8.42%**	8.56%	8.71%	8.85%	8.99%
B. Public Safety and Firefighter	**10.74%**	10.77%	11.09%	11.26%	11.45%

Note: Rates shown for Firefighters and Judges exclude offsets for fire insurance premium tax and court fees
Rates for Tier I Public Employee Systems include the cost of the 75% of pay active death benefit.
The preliminary contribution rates for FY 2018 do not reflect application of U.C. Sec. 49-11-3015(5), the Board's ability to maintain the prior year's contribution rate.

Actuarial Impact of Recommendations

Comparison of Unfunded Actuarial Accrued Liability (UAAL)

($ in millions)

Fund/Division	2016 Valuation	Current Assumptions	Recommended Assumptions: 7.00% Assumed Rate of Return	Recommended Assumptions: 6.95% Assumed Rate of Return	Recommended Assumptions: 6.90% Assumed Rate of Return
(1)	(2)	(3)	(4)	(5)	(6)
I. Public Employees Contributory					
A. Local Government	$ 27	$ 22	$ 25	$ 26	$ 27
B. State and School	46	26	30	31	32
C. Higher Education	N/A	6	8	8	9
II. Public Employees Noncontributory					
A. Local Government	662	560	664	698	732
B. State and School	2,976	2,445	2,806	2,925	3,045
C. Higher Education	N/A	198	226	236	246
III. Public Safety Contributory					
A. Other Division A (2.5% COLA)	3	3	3	3	4
B. Other Division A (4% COLA)	0	0	0	0	0
C. Other Division B (2.5% COLA)	0	0	0	0	0
D. Other Division B (4% COLA)	0	0	0	0	0
IV. Public Safety Noncontributory					
A. State	223	203	228	236	245
B. Other Division A (2.5% COLA)	144	120	152	160	168
C. Other Division A (4% COLA)	50	43	49	52	54
D. Salt Lake City	94	90	100	102	104
E. Ogden	20	20	22	23	24
F. Provo	14	12	13	14	14
G. Logan	7	6	7	7	7
H. Bountiful	7	7	7	8	8
I. Other Division B (2.5% COLA)	66	66	77	80	83
J. Other Division B (4% COLA)	6	4	5	6	6
V. Firefighters					
A. Division A	(1)	(5)	(0)	1	2
B. Division B	18	(4)	15	21	27
VI. Judges	37	34	45	46	47
VII. 3% Substantial Substitute	310	309	309	312	314
VIII. Governors and Legislative	3	2	3	3	3
IX. Tier II - Hybrid Plans					
A. Public Employees	0	0	8	11	14
B. Public Safety and Firefighter	(1)	(1)	0	0	1
X. Grand Total	$ 4,712	$ 4,167	$ 4,807	$ 5,011	$ 5,217

Columns may not add to total due to rounding.

SECTION E

SUMMARY OF RECOMMENDATIONS

Summary of Recommendations

1. Decrease from 2.60% to 2.50% price inflation assumption.

2. Decrease in the COLA assumption for those funds with a 4% maximum COLA from 2.60% to 2.50%.

3. Decrease the investment return assumption from 7.20% to at least 7.00%, with 6.95% or 6.90% as other possible assumptions. The Board elected to use a 6.95% return assumption.

4. Reduce the wage inflation component of the salary assumption by 0.10% to 3.25% and make minor adjustments to the step-rate component of the salary increases for some of the groups.

5. Decrease the payroll growth rate assumption by 0.10% from 3.10% to 3.00%.

6. Use of a new constructed post-retirement mortality assumption based on URS experience. Separate adjustments to the table for educators and non-educators. No change in the mortality improvement projection scale.

7. Move to the most recent published table for disabled retiree mortality assumption.

8. Move to the most recent published table for active member mortality tables.

9. Minor modifications to the rates of disability.

10. Small modifications (some up some down) to the rates of retirement for most employment groups.

11. Slightly modifications to the rates of termination for most groups.

12. Make no change to the use of the individual Entry Age Normal actuarial cost method.

13. Continue to use the five-year smoothing method. Make no change to the 75% - 125% corridor around market.

14. Use a 20-year open amortization for determining the actuarially determined contribution for all the funds expect the Governors and Legislators Pension Plan. The amortization period for the Governors and Legislators Pension Plan will continue to remain closed and be reevaluated during the next assumption review.

SECTION F

SUMMARY OF DATA AND EXPERIENCE

List of Tables

List of Tables (Continued)

List of Tables (Continued)

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
MALE EDUCATORS

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	0	0	N/A	0.08%	0.07%	0.0	0.0	0%	0%
45-49	0	3	0.0000	0.12%	0.11%	0.0	0.0	0%	0%
50-54	1	82	0.0122	0.17%	0.18%	0.2	0.2	647%	630%
55-59	3	855	0.0035	0.29%	0.27%	2.7	2.5	111%	121%
60-64	31	3,345	0.0093	0.54%	0.46%	19.7	16.5	157%	188%
65-69	44	6,086	0.0072	1.07%	0.84%	65.0	52.3	68%	84%
70-74	98	5,606	0.0175	1.77%	1.53%	99.7	86.3	98%	114%
75-79	94	4,374	0.0215	3.22%	2.79%	141.9	122.6	66%	77%
80-84	171	3,397	0.0503	6.08%	5.07%	202.7	170.4	84%	100%
85-89	170	1,712	0.0993	10.84%	9.23%	181.2	154.5	94%	110%
90-94	110	568	0.1937	18.35%	16.80%	98.6	90.0	112%	122%
95-99	26	107	0.2430	26.29%	29.09%	26.5	28.5	98%	91%
Other	2	8	0.2500			2.6	2.9	76%	69%
Totals	750	26,143				841	727	89%	103%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
FEMALE EDUCATORS

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	0	0	N/A	0.08%	0.04%	0	0	0%	0%
45-49	0	21	0.0000	0.10%	0.07%	0.0	0.0	0%	0%
50-54	3	364	0.0082	0.20%	0.11%	0.9	0.4	334%	682%
55-59	12	2,087	0.0057	0.49%	0.17%	9.9	3.8	121%	318%
60-64	29	6,335	0.0046	0.41%	0.32%	26.5	21.6	109%	134%
65-69	77	12,282	0.0063	0.55%	0.60%	70.6	74.7	109%	103%
70-74	90	9,083	0.0099	1.13%	1.14%	99.0	102.9	91%	87%
75-79	117	5,915	0.0198	1.79%	2.16%	107.6	126.8	109%	92%
80-84	147	3,686	0.0399	4.45%	4.11%	163.3	151.0	90%	97%
85-89	177	2,205	0.0803	9.89%	7.81%	210.7	168.7	84%	105%
90-94	149	897	0.1661	17.19%	14.85%	150.1	129.1	99%	115%
95-99	77	328	0.2348	26.15%	26.45%	81.8	82.5	94%	93%
Other	16	32	0.5000			11.1	10.7	145%	150%
Totals	894	43,235				931	872	96%	103%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
MALE PUBLIC SAFETY & FIREFIGHTERS

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	1	160	0.0063	0.09%	0.08%	0.2	0.1	622%	679%
45-49	2	1,170	0.0017	0.13%	0.13%	1.6	1.7	128%	120%
50-54	3	1,880	0.0016	0.19%	0.22%	3.7	4.2	82%	72%
55-59	12	3,123	0.0038	0.33%	0.33%	10.5	10.7	114%	112%
60-64	29	4,379	0.0066	0.60%	0.56%	27.3	25.3	106%	115%
65-69	51	4,720	0.0108	1.18%	1.03%	55.1	48.7	93%	105%
70-74	64	2,980	0.0215	1.96%	1.87%	58.0	55.2	110%	116%
75-79	74	1,898	0.0390	3.57%	3.41%	67.5	64.2	110%	115%
80-84	55	994	0.0553	6.75%	6.20%	65.4	60.5	84%	91%
85-89	64	461	0.1388	12.04%	11.28%	53.8	50.5	119%	127%
90-94	27	131	0.2061	20.39%	20.53%	25.1	25.1	108%	108%
95-99	7	25	0.2800	29.21%	35.55%	7.1	8.6	98%	82%
Other	4	35	0.1143			1.4	1.8	284%	227%
Totals	393	21,956				377	356	104%	110%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
FEMALE PUBLIC SAFETY & FIREFIGHTERS

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	0	53	0.0000	0.09%	0.05%	0.0	0.0	0%	0%
45-49	0	224	0.0000	0.11%	0.09%	0.3	0.2	0%	0%
50-54	1	334	0.0030	0.22%	0.14%	0.8	0.5	128%	214%
55-59	1	512	0.0020	0.54%	0.21%	2.7	1.1	38%	92%
60-64	4	643	0.0062	0.46%	0.39%	3.1	2.5	131%	157%
65-69	11	569	0.0193	0.62%	0.73%	3.6	4.2	305%	264%
70-74	5	404	0.0124	1.26%	1.39%	4.9	5.6	101%	89%
75-79	5	314	0.0159	2.01%	2.64%	6.5	8.3	77%	60%
80-84	9	347	0.0259	4.99%	5.02%	17.5	17.6	51%	51%
85-89	16	160	0.1000	11.09%	9.55%	17.2	15.0	93%	107%
90-94	22	85	0.2588	19.28%	18.15%	15.5	14.4	142%	153%
95-99	9	27	0.3333	29.33%	32.33%	7.2	7.9	124%	114%
Other	5	77	0.0649			1.9	2.0	259%	246%
Totals	88	3,749				81	79	108%	111%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
MALE GENERAL STATE & LOCAL GOVERNMENT

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	0	3	0.0000	0.09%	0.08%	0.0	0.0	0%	0%
45-49	0	76	0.0000	0.13%	0.13%	0.1	0.1	0%	0%
50-54	4	786	0.0051	0.19%	0.22%	1.6	1.8	250%	220%
55-59	18	2,628	0.0068	0.33%	0.33%	9.0	9.1	200%	198%
60-64	75	6,683	0.0112	0.60%	0.56%	44.0	40.3	171%	186%
65-69	191	14,292	0.0134	1.18%	1.03%	170.1	150.5	112%	127%
70-74	255	12,818	0.0199	1.96%	1.87%	252.2	240.1	101%	106%
75-79	384	9,451	0.0406	3.57%	3.41%	338.5	321.8	113%	119%
80-84	386	6,385	0.0605	6.75%	6.20%	425.7	393.5	91%	98%
85-89	420	3,832	0.1096	12.04%	11.28%	450.2	422.3	93%	99%
90-94	260	1,303	0.1995	20.39%	20.53%	253.4	255.3	103%	102%
95-99	89	250	0.3560	29.21%	35.55%	69.4	82.4	128%	108%
Other	11	27	0.4074			9.2	11.5	120%	96%
Totals	2,093	58,534				2,023	1,929	103%	109%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
FEMALE GENERAL STATE & LOCAL GOVERNMENT

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	0	11	0.0000	0.09%	0.06%	0.0	0.0	0%	0%
45-49	1	89	0.0112	0.11%	0.09%	0.1	0.1	915%	1076%
50-54	4	723	0.0055	0.22%	0.14%	1.9	1.1	209%	364%
55-59	20	2,486	0.0080	0.54%	0.22%	13.1	5.7	152%	351%
60-64	90	9,645	0.0093	0.46%	0.40%	45.1	42.5	200%	212%
65-69	195	23,245	0.0084	0.62%	0.76%	152.1	183.0	128%	107%
70-74	288	20,720	0.0139	1.26%	1.45%	254.5	302.0	113%	95%
75-79	376	15,104	0.0249	2.01%	2.76%	312.0	417.7	121%	90%
80-84	498	10,291	0.0484	4.99%	5.25%	509.1	536.9	98%	93%
85-89	560	6,043	0.0927	11.09%	9.98%	650.4	593.3	86%	94%
90-94	455	2,530	0.1798	19.28%	18.97%	470.7	459.7	97%	99%
95-99	171	625	0.2736	29.33%	33.80%	173.2	198.8	99%	86%
Other	38	111	0.3423			38.8	42.6	98%	89%
Totals	2,696	91,623				2,621	2,783	103%	97%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
ALL DISABLED MALES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	3	111	0.0270	2.43%	2.34%	2.7	2.6	110%	115%
45-49	2	152	0.0132	3.04%	2.49%	4.7	3.8	43%	52%
50-54	14	382	0.0366	3.70%	3.05%	14.4	11.9	97%	117%
55-59	35	720	0.0486	4.59%	4.09%	33.2	29.8	105%	117%
60-64	32	652	0.0491	5.70%	5.47%	37.0	35.4	87%	90%
65-69	30	407	0.0737	7.77%	7.68%	31.4	31.1	95%	97%
70-74	32	257	0.1245	10.98%	11.33%	27.7	28.7	115%	111%
75-79	19	125	0.1520	14.36%	16.95%	17.6	20.7	108%	92%
80-84	9	36	0.2500	20.83%	25.37%	6.8	8.5	132%	106%
85-89	0	4	0.0000	29.21%	33.72%	1.1	1.3	0%	0%
90-94	0	0	N/A	37.17%	42.93%	0	0	0%	0%
95-99	0	0	N/A	40.00%	51.79%	0	2.6	0%	0%
Other	3	148	0.0203			0.0	0.0	0%	0%
Totals	179	2,994				177	176	101%	101%

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
ALL DISABLED FEMALES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	0	32	0.0000	1.12%	1.44%	0.4	0.5	0%	0%
45-49	0	119	0.0000	1.75%	1.92%	2.2	2.3	0%	0%
50-54	5	312	0.0160	2.26%	2.50%	7.4	8.0	68%	62%
55-59	33	1,048	0.0315	2.93%	3.28%	32.2	34.9	103%	95%
60-64	56	1,022	0.0548	3.96%	4.53%	41.5	46.2	135%	121%
65-69	42	623	0.0674	5.43%	6.54%	34.5	40.3	122%	104%
70-74	34	342	0.0994	7.51%	9.74%	26.1	32.5	130%	104%
75-79	25	149	0.1678	10.87%	14.81%	16.6	21.7	151%	115%
80-84	8	54	0.1481	15.38%	21.61%	8.4	11.3	96%	71%
85-89	5	16	0.3125	21.25%	30.83%	3.4	4.8	148%	104%
90-94	0	0	N/A	25.45%	41.53%	0	0	0%	0%
95-99	0	0	N/A	32.27%	52.25%	0	0	0%	0%
Other	1	15	0.0667			0.0	0.0	0%	0%
Totals	209	3,732				173	203	121%	103%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
MALE STATE EMPLOYEES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	2	1,769	0.0011	0.03%	0.03%	1.0	1.0	200%	200%
25-29	0	4,997	0.0000	0.03%	0.03%	2.0	2.0	0%	0%
30-34	5	8,001	0.0006	0.04%	0.03%	4.0	3.0	125%	167%
35-39	6	8,741	0.0007	0.07%	0.04%	6.0	3.0	100%	200%
40-44	9	8,399	0.0011	0.10%	0.05%	8.0	4.0	113%	225%
45-49	9	8,516	0.0011	0.14%	0.09%	12.0	7.0	75%	129%
50-54	19	9,634	0.0020	0.20%	0.15%	19.0	14.0	100%	136%
55-59	28	10,091	0.0028	0.29%	0.24%	30.0	24.0	93%	117%
60-64	28	8,354	0.0034	0.47%	0.41%	39.0	34.0	72%	82%
65-69	21	3,746	0.0056	0.69%	0.73%	25.0	26.0	84%	81%
70-74	11	644	0.0171	0.00%	1.29%	3.0	8.0	367%	138%
Totals	138	72,892				149	126	93%	110%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FEMALE STATE EMPLOYEES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	1	2,664	0.0004	0.01%	0.01%	-	0.0	0%	0%
25-29	1	7,602	0.0001	0.01%	0.01%	1.0	1.0	100%	100%
30-34	0	10,009	0.0000	0.02%	0.02%	2.0	2.0	0%	0%
35-39	2	12,107	0.0002	0.03%	0.02%	3.0	3.0	67%	67%
40-44	4	14,701	0.0003	0.04%	0.03%	6.0	5.0	67%	80%
45-49	11	16,735	0.0007	0.07%	0.06%	11.0	9.0	100%	122%
50-54	19	21,069	0.0009	0.10%	0.09%	21.0	19.0	90%	100%
55-59	27	23,086	0.0012	0.15%	0.13%	35.0	30.0	77%	90%
60-64	39	18,322	0.0021	0.23%	0.19%	42.0	35.0	93%	111%
65-69	16	6,183	0.0026	0.33%	0.31%	20.0	18.0	80%	89%
70-74	6	819	0.0073	0.00%	0.54%	2.0	4.0	300%	150%
Totals	126	133,297				143	126	88%	100%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	1,159	0.0000	0.03%	0.03%	0.0	0.0	0%	0%
25-29	1	3,515	0.0003	0.03%	0.03%	1.0	1.0	100%	100%
30-34	6	6,157	0.0010	0.04%	0.03%	3.0	2.0	200%	300%
35-39	5	7,537	0.0007	0.07%	0.04%	5.0	3.0	100%	167%
40-44	5	7,003	0.0007	0.10%	0.05%	7.0	4.0	71%	125%
45-49	8	6,441	0.0012	0.14%	0.09%	9.0	6.0	89%	133%
50-54	15	7,098	0.0021	0.20%	0.15%	14.0	10.0	107%	150%
55-59	16	7,327	0.0022	0.29%	0.24%	21.0	18.0	76%	89%
60-64	18	5,465	0.0033	0.47%	0.41%	25.0	22.0	72%	82%
65-69	5	1,981	0.0025	0.69%	0.73%	13.0	14.0	38%	36%
70-74	4	283	0.0141	0.00%	1.29%	1.0	3.0	400%	133%
Totals	83	53,966				99	83	84%	100%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	933	0.0000	0.01%	0.01%	0.0	0.0	0%	0%
25-29	0	3,296	0.0000	0.01%	0.01%	0.0	0.0	0%	0%
30-34	4	4,702	0.0009	0.02%	0.02%	1.0	1.0	400%	400%
35-39	1	5,258	0.0002	0.03%	0.02%	1.0	1.0	100%	100%
40-44	2	5,536	0.0004	0.04%	0.03%	2.0	2.0	100%	100%
45-49	3	5,502	0.0005	0.07%	0.06%	4.0	3.0	75%	100%
50-54	14	6,403	0.0022	0.10%	0.09%	6.0	6.0	233%	233%
55-59	11	6,860	0.0016	0.15%	0.13%	10.0	9.0	110%	122%
60-64	5	5,477	0.0009	0.23%	0.19%	13.0	10.0	38%	50%
65-69	4	2,075	0.0019	0.33%	0.31%	7.0	6.0	57%	67%
70-74	1	249	0.0040	0.00%	0.54%	1.0	1.0	100%	100%
Totals	45	46,291				45	39	100%	115%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
MALE EDUCATORS

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	216	0.0000	0.02%	0.03%	0.0	0.1	0%	0%
25-29	0	2,350	0.0000	0.02%	0.03%	0.5	0.6	0%	0%
30-34	1	4,774	0.0002	0.03%	0.03%	1.4	1.3	73%	78%
35-39	1	5,433	0.0002	0.05%	0.03%	2.4	1.7	41%	59%
40-44	6	5,071	0.0012	0.06%	0.04%	3.1	2.1	193%	286%
45-49	4	4,769	0.0008	0.09%	0.07%	4.1	3.3	97%	122%
50-54	8	4,531	0.0018	0.12%	0.12%	5.6	5.3	143%	151%
55-59	6	4,182	0.0014	0.18%	0.19%	7.7	8.1	78%	74%
60-64	6	3,075	0.0020	0.30%	0.33%	8.9	9.9	68%	61%
65-69	3	1,068	0.0028	0.43%	0.58%	4.4	5.8	68%	51%
70-74	2	114	0.0175	0.00%	1.03%	0.3	1.0	576%	192%
Totals	37	35,583				38	39	96%	94%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FEMALE EDUCATORS

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	2,995	0.0000	0.01%	0.01%	0.2	0.2	0%	0%
25-29	0	12,208	0.0000	0.01%	0.01%	1.0	1.0	0%	0%
30-34	2	11,878	0.0002	0.01%	0.01%	1.4	1.2	138%	163%
35-39	4	11,692	0.0003	0.02%	0.01%	2.3	1.6	175%	252%
40-44	5	12,866	0.0004	0.03%	0.02%	3.9	2.6	129%	190%
45-49	7	12,395	0.0006	0.05%	0.03%	5.8	4.3	122%	164%
50-54	5	13,033	0.0004	0.07%	0.06%	9.1	7.3	55%	69%
55-59	13	13,214	0.0010	0.11%	0.08%	14.0	10.9	93%	119%
60-64	10	10,249	0.0010	0.16%	0.12%	16.4	12.2	61%	82%
65-69	6	3,172	0.0019	0.23%	0.19%	7.0	5.7	86%	105%
70-74	1	269	0.0037	0.00%	0.34%	0.4	0.8	229%	124%
Totals	53	103,971				61	48	86%	111%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
PUBLIC SAFETY - MALES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	423	0.0000	0.03%	0.03%	0.1	0.2	0%	0%
25-29	4	3,437	0.0012	0.03%	0.03%	1.1	1.1	371%	366%
30-34	5	6,176	0.0008	0.05%	0.03%	2.8	2.1	176%	241%
35-39	6	7,126	0.0008	0.07%	0.04%	5.1	2.8	117%	216%
40-44	6	6,732	0.0009	0.10%	0.05%	6.6	3.5	91%	173%
45-49	2	4,588	0.0004	0.14%	0.09%	6.3	3.9	32%	52%
50-54	4	2,739	0.0015	0.20%	0.15%	5.3	3.9	75%	102%
55-59	1	1,657	0.0006	0.29%	0.24%	4.8	3.9	21%	25%
60-64	1	946	0.0011	0.47%	0.41%	4.3	3.8	23%	27%
65-69	2	257	0.0078	0.69%	0.73%	1.7	1.7	119%	115%
70-74	0	0	N/A	0.00%	1.29%	0	0	0%	0%
Totals	31	34,081				38	27	81%	116%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
PUBLIC SAFETY - FEMALES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	78	0.0000	0.01%	0.01%	0.0	0.0	0%	0%
25-29	0	351	0.0000	0.01%	0.02%	0.0	0.1	0%	0%
30-34	0	644	0.0000	0.02%	0.02%	0.1	0.1	0%	0%
35-39	1	859	0.0012	0.03%	0.03%	0.2	0.2	418%	430%
40-44	2	840	0.0024	0.04%	0.04%	0.4	0.3	556%	585%
45-49	0	695	0.0000	0.07%	0.07%	0.5	0.5	0%	0%
50-54	1	488	0.0020	0.10%	0.11%	0.5	0.5	210%	187%
55-59	1	336	0.0030	0.15%	0.16%	0.5	0.5	200%	183%
60-64	0	165	0.0000	0.23%	0.24%	0.4	0.4	0%	0%
65-69	0	32	0.0000	0.33%	0.39%	0.1	0.1	0%	0%
70-74	0	0	N/A	0.00%	0.68%	0	0.0	0%	0%
Totals	5	4,488				3	3	187%	176%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FIREFIGHTERS - MALES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	78	0.0000	0.03%	0.03%	0.0	0.0	0%	0%
25-29	1	615	0.0016	0.03%	0.03%	0.2	0.2	517%	513%
30-34	1	1,726	0.0006	0.05%	0.03%	0.8	0.6	124%	171%
35-39	2	2,223	0.0009	0.07%	0.04%	1.6	0.9	125%	231%
40-44	2	1,877	0.0011	0.10%	0.05%	1.8	1.0	109%	207%
45-49	1	1,284	0.0008	0.14%	0.09%	1.8	1.1	57%	93%
50-54	1	856	0.0012	0.20%	0.15%	1.7	1.2	60%	81%
55-59	0	567	0.0000	0.29%	0.24%	1.6	1.3	0%	0%
60-64	2	284	0.0070	0.47%	0.41%	1.3	1.1	154%	177%
65-69	0	50	0.0000	0.69%	0.73%	0.3	0.3	0%	0%
70-74	0	0	N/A	0.00%	1.29%	0	0.0	0%	0%
Totals	10	9,560				11	8	90%	129%

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FIREFIGHTERS - FEMALES

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	3	0.0000	0.01%	0.01%	0.0	0.0	0%	0%
25-29	0	22	0.0000	0.01%	0.02%	0.0	0.0	0%	0%
30-34	0	64	0.0000	0.02%	0.02%	0.0	0.0	0%	0%
35-39	0	61	0.0000	0.03%	0.03%	0.0	0.0	0%	0%
40-44	0	67	0.0000	0.04%	0.04%	0.1	0.1	0%	0%
45-49	0	55	0.0000	0.07%	0.07%	0.1	0.1	0%	0%
50-54	0	21	0.0000	0.10%	0.11%	0.0	0.0	0%	0%
55-59	0	2	0.0000	0.15%	0.16%	0.0	0.0	0%	0%
60-64	0	3	0.0000	0.23%	0.24%	0.0	0.0	0%	0%
65-69	0	0	N/A	0.33%	0.39%	0.0	0.0	0%	0%
70-74	0	0	N/A	0.00%	0.68%	0.0	0.0	0%	0%
Totals	0	298				0	0	0%	0%

Summary of Data and Experience

DISABILITY EXPERIENCE
MALE STATE EMPLOYEES

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	1,769	0.0000	0.02%	0.02%	0.5	0.4	0%	0%
25-29	1	4,997	0.0002	0.05%	0.04%	2.5	2.2	39%	45%
30-34	6	8,001	0.0007	0.09%	0.08%	7.3	6.3	83%	95%
35-39	6	8,741	0.0007	0.12%	0.10%	10.2	8.9	59%	67%
40-44	12	8,399	0.0014	0.17%	0.15%	14.7	12.8	82%	94%
45-49	10	8,457	0.0012	0.26%	0.23%	22.2	19.3	45%	52%
50-54	24	9,026	0.0027	0.35%	0.30%	32.0	27.8	75%	86%
55-59	45	8,420	0.0053	0.55%	0.48%	45.7	39.7	98%	113%
60-64	41	6,805	0.0060	0.68%	0.59%	46.1	40.1	89%	102%
65-69	7	2,735	0.0026	0.72%	0.63%	19.8	17.2	35%	41%
70-74	1	1,024	0.0010	0.72%	0.63%	7.4	6.5	13%	16%
Totals	153	68,374				208	181	73%	84%

Summary of Data and Experience

DISABILITY EXPERIENCE
FEMALE STATE EMPLOYEES

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	2,664	0.0000	0.02%	0.02%	0.6	0.5	0%	0%
25-29	2	7,602	0.0003	0.04%	0.03%	3.3	2.8	61%	72%
30-34	6	10,009	0.0006	0.08%	0.07%	7.9	6.7	76%	89%
35-39	1	12,107	0.0001	0.10%	0.09%	12.4	10.5	8%	9%
40-44	20	14,701	0.0014	0.15%	0.13%	22.5	19.1	89%	105%
45-49	38	16,695	0.0023	0.23%	0.20%	38.2	32.5	100%	117%
50-54	49	20,382	0.0024	0.30%	0.26%	63.2	53.7	78%	91%
55-59	82	21,492	0.0038	0.48%	0.41%	101.8	86.5	81%	95%
60-64	73	16,521	0.0044	0.59%	0.50%	97.0	82.4	75%	89%
65-69	11	4,522	0.0024	0.63%	0.54%	28.5	24.2	39%	45%
70-74	3	1,244	0.0024	0.63%	0.54%	7.8	6.7	38%	45%
Totals	285	127,939				383	326	74%	88%

Summary of Data and Experience

DISABILITY EXPERIENCE
MALE EDUCATORS

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	216	0.0000	0.01%	0.01%	0.0	0.0	0%	0%
25-29	0	2,350	0.0000	0.02%	0.02%	0.5	0.5	0%	0%
30-34	0	4,774	0.0000	0.04%	0.04%	1.7	1.7	0%	0%
35-39	1	5,433	0.0002	0.05%	0.05%	2.5	2.5	40%	40%
40-44	0	5,071	0.0000	0.07%	0.07%	3.5	3.5	0%	0%
45-49	1	4,769	0.0002	0.10%	0.10%	4.9	4.9	21%	21%
50-54	4	4,429	0.0009	0.14%	0.14%	6.1	6.1	65%	65%
55-59	13	3,117	0.0042	0.22%	0.22%	6.6	6.6	198%	198%
60-64	8	1,987	0.0040	0.27%	0.27%	5.3	5.3	152%	152%
65-69	1	625	0.0016	0.28%	0.28%	1.8	1.8	56%	56%
70-74	0	132	0.0000	0.28%	0.28%	0.4	0.4	0%	0%
Totals	28	32,903				33	33	84%	84%

Summary of Data and Experience

DISABILITY EXPERIENCE
FEMALE EDUCATORS

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	2,995	0.0000	0.01%	0.01%	0.5	0.5	0%	0%
25-29	0	12,208	0.0000	0.02%	0.02%	3.1	3.1	0%	0%
30-34	10	11,878	0.0008	0.05%	0.05%	5.5	5.5	180%	180%
35-39	5	11,692	0.0004	0.06%	0.06%	7.2	7.2	70%	70%
40-44	1	12,866	0.0001	0.09%	0.09%	11.8	11.8	9%	9%
45-49	11	12,394	0.0009	0.14%	0.14%	16.9	16.9	65%	65%
50-54	24	12,249	0.0020	0.18%	0.18%	22.5	22.5	106%	106%
55-59	26	11,081	0.0023	0.29%	0.29%	31.5	31.5	83%	83%
60-64	24	8,904	0.0027	0.35%	0.35%	31.4	31.4	76%	76%
65-69	6	2,165	0.0028	0.38%	0.38%	8.2	8.2	73%	73%
70-74	1	370	0.0027	0.38%	0.38%	1.4	1.4	72%	72%
Totals	108	98,802				140	140	77%	77%

Summary of Data and Experience

DISABILITY EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	1,159	0.0000	0.02%	0.02%	0.3	0.3	0%	0%
25-29	1	3,515	0.0003	0.05%	0.04%	1.8	1.6	55%	64%
30-34	2	6,157	0.0003	0.09%	0.08%	5.6	4.9	36%	41%
35-39	4	7,537	0.0005	0.12%	0.10%	8.8	7.7	45%	52%
40-44	6	7,003	0.0009	0.17%	0.15%	12.2	10.6	49%	56%
45-49	7	6,406	0.0011	0.26%	0.23%	16.8	14.6	42%	48%
50-54	14	6,598	0.0021	0.35%	0.30%	23.3	20.3	60%	69%
55-59	31	6,233	0.0050	0.55%	0.48%	33.9	29.5	91%	105%
60-64	30	4,439	0.0068	0.68%	0.59%	30.0	26.1	100%	115%
65-69	3	1,317	0.0023	0.72%	0.63%	9.5	8.3	31%	36%
70-74	0	422	0.0000	0.72%	0.63%	3.1	2.7	0%	0%
Totals	98	50,786				145	126	67%	78%

Summary of Data and Experience

DISABILITY EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	933	0.0000	0.02%	0.02%	0.2	0.2	0%	0%
25-29	0	3,296	0.0000	0.04%	0.03%	1.4	1.2	0%	0%
30-34	2	4,702	0.0004	0.08%	0.07%	3.7	3.1	54%	64%
35-39	2	5,258	0.0004	0.10%	0.09%	5.4	4.6	37%	44%
40-44	9	5,536	0.0016	0.15%	0.13%	8.4	7.2	107%	126%
45-49	7	5,490	0.0013	0.23%	0.20%	12.5	10.6	56%	66%
50-54	7	6,173	0.0011	0.30%	0.26%	19.1	16.3	37%	43%
55-59	24	6,412	0.0037	0.48%	0.41%	30.4	25.8	79%	93%
60-64	18	5,003	0.0036	0.59%	0.50%	29.4	25.0	61%	72%
65-69	3	1,562	0.0019	0.63%	0.54%	9.8	8.4	30%	36%
70-74	0	364	0.0000	0.63%	0.54%	2.3	1.9	0%	0%
Totals	72	44,729				123	104	59%	69%

Summary of Data and Experience

DISABILITY EXPERIENCE
PUBLIC SAFETY - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	504	0.0000	0.03%	0.02%	0.2	0.2	0%	0%
25-29	1	3,816	0.0003	0.06%	0.05%	2.6	2.1	39%	48%
30-34	5	6,836	0.0007	0.12%	0.10%	8.1	6.5	62%	77%
35-39	3	7,987	0.0004	0.15%	0.12%	12.2	9.8	25%	31%
40-44	11	6,793	0.0016	0.23%	0.18%	15.2	12.2	72%	90%
45-49	6	3,218	0.0019	0.35%	0.28%	10.8	8.6	56%	70%
50-54	3	1,489	0.0020	0.45%	0.36%	6.7	5.4	45%	56%
55-59	8	844	0.0095	0.72%	0.58%	5.9	4.8	135%	168%
60-64	2	430	0.0047	0.89%	0.71%	3.8	3.0	53%	66%
65-69	2	60	0.0333	0.00%	0.00%	0.0	0.0	0%	0%
70-74	1	3	0.3333	0.00%	0.00%	0.0	0.0	0%	0%
Totals	42	31,980				66	52	64%	80%

Summary of Data and Experience

DISABILITY EXPERIENCE
FIREFIGHTERS - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	53	0.0000	0.04%	0.04%	0.0	0.0	0%	0%
25-29	0	440	0.0000	0.07%	0.08%	0.4	0.4	0%	0%
30-34	1	1,470	0.0007	0.14%	0.17%	2.1	2.5	47%	40%
35-39	6	2,108	0.0028	0.18%	0.21%	3.9	4.5	155%	133%
40-44	6	1,757	0.0034	0.27%	0.32%	4.8	5.5	126%	108%
45-49	8	910	0.0088	0.41%	0.48%	3.7	4.3	219%	188%
50-54	2	399	0.0050	0.54%	0.63%	2.2	2.5	93%	79%
55-59	3	142	0.0211	0.86%	1.01%	1.2	1.4	255%	219%
60-64	0	44	0.0000	1.06%	1.24%	0.5	0.5	0%	0%
65-69	0	3	0.0000	0.00%	0.00%	0.0	0.0	0%	0%
70-74	0	0	N/A	0.00%	0.00%	0.0	0.0	0%	0%
Totals	26	7,326				19	22	140%	120%

Summary of Data and Experience

TERMINATION EXPERIENCE
MALE STATE EMPLOYEES

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	953	2,996	0.3181	28.00%	25.00%	839	749	114%	127%
1	1,083	4,785	0.2263	24.50%	20.00%	1,172	957	92%	113%
2	659	3,923	0.1680	15.00%	14.00%	588	549	112%	120%
3	462	3,470	0.1331	12.00%	10.00%	416	347	111%	133%
4	411	3,418	0.1202	10.00%	10.00%	342	342	120%	120%
5	345	3,315	0.1041	9.00%	10.00%	298	332	116%	104%
6	293	3,152	0.0930	7.50%	9.00%	236	284	124%	103%
7	241	3,084	0.0781	6.50%	7.50%	200	231	121%	104%
8	173	2,911	0.0594	5.50%	6.00%	160	175	108%	99%
9	150	2,466	0.0608	5.00%	5.50%	123	136	122%	110%
10	112	2,156	0.0519	4.25%	5.00%	92	108	122%	104%
11	104	2,058	0.0505	4.00%	4.50%	82	93	127%	112%
12	105	1,952	0.0538	3.75%	4.00%	73	78	144%	135%
13	83	1,955	0.0425	3.50%	3.75%	68	73	122%	114%
14	79	1,992	0.0397	3.00%	3.50%	60	70	132%	113%
15	55	1,883	0.0292	2.50%	3.00%	47	56	117%	98%
16	53	1,819	0.0291	2.25%	2.75%	41	50	129%	106%
17	54	1,754	0.0308	2.25%	2.50%	39	44	138%	123%
18	39	1,637	0.0238	2.00%	2.00%	33	33	118%	118%
19	39	1,380	0.0283	2.00%	2.00%	28	28	139%	139%
20	36	1,295	0.0278	2.00%	2.00%	26	26	138%	138%
21	36	1,211	0.0297	2.00%	2.00%	24	24	150%	150%
22	24	1,128	0.0213	2.00%	2.00%	23	23	104%	104%
23	18	1,063	0.0169	1.50%	1.50%	16	16	113%	113%
24	15	385	0.0390	1.50%	1.50%	6	6	250%	250%
Total	5,622	57,188				5,032	4,830	112%	116%

Summary of Data and Experience

TERMINATION EXPERIENCE
FEMALE STATE EMPLOYEES

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	1,695	5,023	0.3374	30.00%	28.00%	1,507	1,406	112%	121%
1	2,064	8,014	0.2575	22.50%	23.00%	1,803	1,843	114%	112%
2	1,309	6,697	0.1955	17.00%	17.00%	1,138	1,138	115%	115%
3	996	6,352	0.1568	14.00%	13.00%	889	826	112%	121%
4	868	6,513	0.1333	11.00%	12.50%	716	814	121%	107%
5	792	6,585	0.1203	9.50%	11.00%	626	724	127%	109%
6	662	6,475	0.1022	8.50%	10.00%	550	648	120%	102%
7	570	6,349	0.0898	7.50%	7.50%	476	476	120%	120%
8	457	5,961	0.0767	6.50%	6.50%	387	387	118%	118%
9	335	5,053	0.0663	6.00%	6.00%	303	303	111%	110%
10	273	4,503	0.0606	5.50%	5.50%	248	248	110%	110%
11	229	4,318	0.0530	4.75%	4.75%	205	205	112%	112%
12	217	4,161	0.0522	4.50%	4.50%	187	187	116%	116%
13	191	4,048	0.0472	4.25%	4.25%	172	172	111%	111%
14	200	3,952	0.0506	3.75%	3.75%	148	148	135%	135%
15	152	3,742	0.0406	3.50%	3.50%	131	131	116%	116%
16	129	3,438	0.0375	3.00%	3.00%	103	103	125%	125%
17	91	3,135	0.0290	2.75%	2.75%	86	86	106%	106%
18	102	2,865	0.0356	2.75%	2.75%	79	79	129%	129%
19	83	2,356	0.0352	2.75%	2.75%	65	65	128%	128%
20	71	2,023	0.0351	2.75%	2.75%	56	56	127%	128%
21	62	1,898	0.0327	2.50%	2.50%	47	47	132%	131%
22	48	1,707	0.0281	2.25%	2.25%	38	38	126%	125%
23	36	1,587	0.0227	2.00%	2.00%	32	32	113%	113%
24	28	559	0.0501	2.00%	2.00%	11	11	255%	250%
Total	11,660	# 107,314				10,003	10,175	117%	115%

Summary of Data and Experience

TERMINATION EXPERIENCE
MALE EDUCATORS

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	294	1,415	0.2078	15.00%	14.00%	212	198	139%	148%
1	300	2,130	0.1408	13.00%	11.00%	277	234	108%	128%
2	182	1,767	0.1030	9.00%	8.00%	159	141	114%	129%
3	129	1,623	0.0795	7.50%	7.00%	122	114	106%	113%
4	126	1,517	0.0831	6.50%	6.50%	99	99	127%	127%
5	104	1,478	0.0704	5.00%	6.00%	74	89	141%	117%
6	84	1,453	0.0578	4.00%	5.50%	58	80	145%	105%
7	50	1,454	0.0344	3.50%	4.00%	51	58	98%	86%
8	67	1,416	0.0473	3.25%	3.50%	46	50	146%	134%
9	61	1,306	0.0467	3.00%	3.00%	39	39	156%	156%
10	27	1,163	0.0232	2.75%	2.75%	32	32	84%	84%
11	36	1,080	0.0333	2.50%	2.50%	27	27	133%	133%
12	27	1,017	0.0265	2.25%	2.50%	23	25	117%	108%
13	24	983	0.0244	2.25%	2.25%	22	22	109%	109%
14	23	979	0.0235	2.00%	2.00%	20	20	115%	115%
15	12	1,000	0.0120	1.75%	2.00%	18	20	67%	60%
16	30	989	0.0303	1.75%	1.75%	17	17	176%	176%
17	16	946	0.0169	1.75%	1.75%	17	17	94%	94%
18	24	903	0.0266	1.75%	1.75%	16	16	150%	150%
19	16	848	0.0189	1.50%	1.50%	13	13	123%	123%
20	16	757	0.0211	1.00%	1.00%	8	8	200%	200%
21	17	718	0.0237	1.00%	1.00%	7	7	243%	243%
22	10	645	0.0155	1.00%	1.00%	6	6	167%	167%
23	7	613	0.0114	1.00%	1.00%	6	6	117%	117%
24	5	187	0.0267	1.00%	1.00%	2	2	250%	250%
Total	1,687	28,387				1,371	1,340	123%	126%

Summary of Data and Experience

TERMINATION EXPERIENCE
FEMALE EDUCATORS

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	1,052	4,701	0.2238	18.00%	16.00%	846	752	124%	140%
1	1,262	7,179	0.1758	17.00%	15.00%	1,220	1,077	103%	117%
2	805	6,050	0.1331	13.50%	12.00%	817	726	99%	111%
3	725	5,655	0.1282	12.50%	10.00%	707	566	103%	128%
4	605	5,477	0.1105	10.00%	9.00%	548	493	110%	123%
5	519	5,297	0.0980	8.00%	8.00%	424	424	122%	122%
6	401	5,131	0.0782	7.50%	7.50%	385	385	104%	104%
7	315	4,948	0.0637	5.50%	6.00%	272	297	116%	106%
8	236	4,564	0.0517	4.50%	5.00%	205	228	115%	104%
9	190	3,994	0.0476	4.50%	4.50%	180	180	106%	106%
10	144	3,513	0.0410	4.00%	4.00%	141	141	102%	102%
11	110	3,189	0.0345	3.00%	3.50%	96	112	115%	98%
12	109	2,966	0.0367	2.50%	3.25%	74	96	147%	114%
13	86	2,769	0.0311	2.00%	3.00%	55	83	156%	104%
14	71	2,688	0.0264	2.00%	2.50%	54	67	131%	106%
15	64	2,618	0.0244	2.00%	2.25%	52	59	123%	108%
16	51	2,480	0.0206	2.00%	2.00%	50	50	102%	102%
17	45	2,334	0.0193	1.75%	1.75%	41	41	110%	110%
18	44	2,168	0.0203	1.50%	1.50%	33	33	133%	133%
19	28	1,828	0.0153	1.25%	1.25%	23	23	122%	122%
20	33	1,528	0.0216	1.25%	1.25%	19	19	174%	174%
21	31	1,470	0.0211	1.25%	1.25%	18	18	172%	172%
22	27	1,311	0.0206	1.25%	1.25%	16	16	169%	169%
23	22	1,204	0.0183	1.25%	1.25%	15	15	147%	147%
24	11	426	0.0258	1.25%	1.25%	5	5	220%	220%
Total	6,986	85,488				6,296	5,906	111%	118%

Summary of Data and Experience

TERMINATION EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	450	1,973	0.2281	19.00%	17.00%	375	335	120%	134%
1	478	3,151	0.1517	15.00%	13.00%	473	410	101%	117%
2	285	2,591	0.1100	11.00%	9.00%	285	233	100%	122%
3	276	2,434	0.1134	9.00%	8.00%	219	195	126%	142%
4	227	2,480	0.0915	8.00%	7.50%	198	186	115%	122%
5	187	2,624	0.0713	7.00%	7.00%	184	184	102%	102%
6	199	2,704	0.0736	6.00%	6.50%	162	176	123%	113%
7	168	2,650	0.0634	5.50%	6.00%	146	159	115%	106%
8	171	2,518	0.0679	4.75%	5.50%	120	138	143%	124%
9	104	2,189	0.0475	4.00%	4.75%	88	104	118%	100%
10	88	1,886	0.0467	3.50%	4.50%	66	85	133%	104%
11	77	1,754	0.0439	3.25%	4.00%	57	70	135%	110%
12	56	1,670	0.0335	3.00%	3.50%	50	58	112%	97%
13	52	1,611	0.0323	3.00%	3.00%	48	48	108%	108%
14	48	1,612	0.0298	3.00%	3.00%	48	48	100%	100%
15	44	1,559	0.0282	2.75%	2.75%	43	43	102%	102%
16	43	1,503	0.0286	2.75%	2.75%	41	41	105%	105%
17	40	1,412	0.0283	2.75%	2.75%	39	39	103%	103%
18	36	1,289	0.0279	2.50%	2.50%	32	32	113%	113%
19	40	1,100	0.0364	2.50%	2.50%	28	28	143%	143%
20	28	913	0.0307	2.00%	2.00%	18	18	156%	156%
21	18	785	0.0229	2.00%	2.00%	16	16	113%	113%
22	17	718	0.0237	1.75%	1.75%	13	13	131%	131%
23	12	662	0.0181	1.50%	1.50%	10	10	120%	120%
24	9	269	0.0335	1.25%	1.25%	3	3	300%	300%
Total	3,153	44,057				2,762	2,672	114%	118%

Summary of Data and Experience

TERMINATION EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	600	1,969	0.3047	24.00%	22.00%	473	433	127%	139%
1	666	3,063	0.2174	18.00%	18.00%	551	551	121%	121%
2	389	2,396	0.1624	14.00%	13.00%	335	311	116%	125%
3	324	2,222	0.1458	12.00%	11.00%	267	244	121%	133%
4	328	2,320	0.1414	11.00%	10.50%	255	244	129%	135%
5	264	2,372	0.1113	9.75%	10.00%	231	237	114%	111%
6	257	2,400	0.1071	8.00%	9.50%	192	228	134%	113%
7	221	2,340	0.0944	7.50%	9.00%	176	211	126%	105%
8	143	2,171	0.0659	6.50%	7.50%	141	163	101%	88%
9	137	1,933	0.0709	6.00%	7.00%	116	135	118%	101%
10	101	1,658	0.0609	5.50%	6.00%	91	99	111%	102%
11	94	1,527	0.0616	5.00%	5.50%	76	84	124%	112%
12	87	1,460	0.0596	4.50%	5.25%	66	77	132%	114%
13	83	1,460	0.0568	4.00%	5.00%	58	73	143%	114%
14	52	1,368	0.0380	3.75%	4.50%	51	62	102%	84%
15	55	1,306	0.0421	3.50%	4.00%	46	52	120%	105%
16	55	1,218	0.0452	3.25%	3.75%	40	46	138%	120%
17	48	1,119	0.0429	3.25%	3.50%	36	39	133%	123%
18	32	995	0.0322	3.00%	3.00%	30	30	107%	107%
19	31	831	0.0373	2.75%	3.00%	23	25	135%	124%
20	16	667	0.0240	2.50%	2.50%	17	17	94%	96%
21	28	620	0.0452	2.50%	2.50%	16	16	175%	181%
22	20	529	0.0378	2.25%	2.25%	12	12	167%	168%
23	16	470	0.0340	2.00%	2.00%	9	9	178%	170%
24	10	200	0.0500	2.00%	2.00%	4	4	250%	250%
Total	4,057	38,614				3,312	3,402	122%	119%

Summary of Data and Experience

TERMINATION EXPERIENCE
PUBLIC SAFETY EMPLOYEES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	132	889	0.1485	12.00%	12.00%	107	107	123%	123%
1	156	1,897	0.0822	6.50%	6.50%	123	123	127%	127%
2	111	1,738	0.0639	5.50%	5.50%	96	96	116%	116%
3	123	1,645	0.0748	5.25%	5.25%	86	86	143%	143%
4	94	1,750	0.0537	5.00%	5.00%	88	88	107%	107%
5	90	1,809	0.0498	4.50%	4.50%	81	81	111%	111%
6	81	1,892	0.0428	4.25%	4.25%	80	80	101%	101%
7	96	1,997	0.0481	4.00%	4.00%	80	80	120%	120%
8	76	1,993	0.0381	3.50%	3.50%	70	70	109%	109%
9	66	1,821	0.0362	3.25%	3.25%	59	59	112%	112%
10	59	1,658	0.0356	3.00%	3.00%	50	50	118%	118%
11	41	1,566	0.0262	2.75%	2.75%	43	43	95%	95%
12	35	1,527	0.0229	2.50%	2.50%	38	38	92%	92%
13	45	1,524	0.0295	2.25%	2.25%	34	34	132%	132%
14	33	1,517	0.0218	1.50%	1.50%	23	23	143%	143%
15	36	1,574	0.0229	1.50%	1.50%	24	24	150%	150%
16	20	1,525	0.0131	1.50%	1.50%	23	23	87%	87%
17	35	1,453	0.0241	1.50%	1.50%	22	22	159%	159%
18	7	1,287	0.0054	1.50%	1.50%	19	19	37%	37%
19	15	523	0.0287	1.50%	1.50%	8	8	188%	188%
Total	1,351	31,585				1,154	1,154	117%	117%

Summary of Data and Experience

TERMINATION EXPERIENCE
FIREFIGHTERS - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	12	202	0.0594	6.00%	6.00%	12.0	12.0	100%	100%
1	19	399	0.0476	3.50%	5.00%	14.0	20.0	136%	95%
2	11	388	0.0284	3.00%	4.00%	12.0	16.0	92%	69%
3	14	415	0.0337	2.50%	3.50%	10.0	15.0	140%	93%
4	22	465	0.0473	2.50%	3.00%	12.0	14.0	183%	157%
5	11	510	0.0216	2.00%	2.50%	10.0	13.0	110%	85%
6	14	519	0.0270	1.50%	2.25%	8.0	12.0	175%	117%
7	7	513	0.0136	1.50%	2.00%	8.0	10.0	88%	70%
8	5	488	0.0102	1.50%	1.75%	7.0	9.0	71%	56%
9	4	452	0.0088	1.50%	1.50%	7.0	7.0	57%	57%
10	10	417	0.0240	1.50%	1.50%	6.0	6.0	167%	167%
11	6	414	0.0145	1.50%	1.50%	6.0	6.0	100%	100%
12	10	427	0.0234	0.50%	0.50%	2.0	2.0	500%	500%
13	4	411	0.0097	0.50%	0.50%	2.0	2.0	200%	200%
14	1	424	0.0024	0.50%	0.50%	2.0	2.0	50%	50%
15	5	439	0.0114	0.50%	0.50%	2.0	2.0	250%	250%
16	2	401	0.0050	0.50%	0.50%	2.0	2.0	100%	100%
17	6	369	0.0163	0.50%	0.50%	2.0	2.0	300%	300%
18	2	341	0.0059	0.50%	0.50%	2.0	2.0	100%	100%
19	5	142	0.0352	0.50%	0.50%	1.0	1.0	500%	500%
Total	170	8,136				127	155	134%	110%

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE STATE EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	11	59	0.1864	20.00%	20.00%	11.8	11.8	93%	93%
50	9	48	0.1875	15.00%	15.00%	7.2	7.2	125%	125%
51	9	79	0.1139	15.00%	15.00%	11.9	11.9	76%	76%
52	12	104	0.1154	15.00%	15.00%	15.6	15.6	77%	77%
53	23	167	0.1377	15.00%	15.00%	25.1	25.1	92%	92%
54	19	210	0.0905	15.00%	15.00%	31.5	31.5	60%	60%
55	31	277	0.1119	16.00%	16.00%	44.3	44.3	70%	70%
56	31	315	0.0984	16.00%	16.00%	50.4	50.4	62%	62%
57	44	340	0.1294	16.00%	16.00%	54.4	54.4	81%	81%
58	52	356	0.1461	16.00%	16.00%	57.0	57.0	91%	91%
59	54	383	0.1410	16.00%	16.00%	61.3	61.3	88%	88%
60	66	387	0.1705	20.00%	20.00%	77.4	77.4	85%	85%
61	57	350	0.1629	20.00%	20.00%	70.0	70.0	81%	81%
62	86	331	0.2598	33.00%	30.00%	109.2	99.3	79%	87%
63	81	279	0.2903	33.00%	30.00%	92.1	83.7	88%	97%
64	51	202	0.2525	30.00%	30.00%	60.6	60.6	84%	84%
65	189	1,074	0.1760	22.00%	22.00%	236.3	236.3	80%	80%
66	220	857	0.2567	22.00%	22.00%	188.5	188.5	117%	117%
67	143	631	0.2266	22.00%	22.00%	138.8	138.8	103%	103%
68	82	472	0.1737	22.00%	22.00%	103.8	103.8	79%	79%
69	74	395	0.1873	22.00%	22.00%	86.9	86.9	85%	85%
70	63	293	0.2150	22.00%	22.00%	64.5	64.5	98%	98%
71	34	222	0.1532	22.00%	22.00%	48.8	48.8	70%	70%
72	37	190	0.1947	22.00%	22.00%	41.8	41.8	89%	89%
73	25	156	0.1603	22.00%	22.00%	34.3	34.3	73%	73%
74	26	131	0.1985	22.00%	22.00%	28.8	28.8	90%	90%
Subtotal	1,529	8,308				1,752	1,734	87%	88%
75 or more	87	434	0.2005	100.00%	100.00%	434.0	434.0	20%	20%
Totals	1,616	8,742				2,186	2,168	74%	75%

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE STATE EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	11	602	0.0183	2.25%	2.25%	12.5	12.5	88%	88%
50	4	248	0.0161	2.25%	2.25%	5.6	5.6	72%	72%
51	5	297	0.0168	2.25%	2.25%	6.7	6.7	75%	75%
52	7	348	0.0201	2.50%	2.50%	8.7	8.7	80%	80%
53	7	387	0.0181	2.50%	2.50%	9.7	9.7	72%	72%
54	7	373	0.0188	2.50%	2.50%	9.3	9.3	75%	75%
55	5	364	0.0137	2.50%	2.50%	9.1	9.1	55%	55%
56	9	345	0.0261	4.00%	4.00%	13.8	13.8	65%	65%
57	4	343	0.0117	4.00%	4.00%	13.7	13.7	29%	29%
58	8	323	0.0248	4.00%	4.00%	12.9	12.9	62%	62%
59	8	297	0.0269	5.00%	5.00%	14.9	14.9	54%	54%
60	33	601	0.0549	7.50%	7.50%	45.1	45.1	73%	73%
61	30	567	0.0529	7.50%	7.50%	42.5	42.5	71%	71%
62	114	985	0.1157	13.00%	13.00%	128.1	128.1	89%	89%
63	100	839	0.1192	13.00%	13.00%	109.1	109.1	92%	92%
64	83	731	0.1135	13.00%	13.00%	95.0	95.0	87%	87%
Totals	435	7,650				537	537	81%	81%

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
FEMALE STATE EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	5	40	0.1250	17.00%	17.00%	6.8	6.8	74%	74%
50	9	58	0.1552	17.00%	17.00%	9.9	9.9	91%	91%
51	20	94	0.2128	16.00%	16.00%	15.0	15.0	133%	133%
52	16	131	0.1221	16.00%	16.00%	21.0	21.0	76%	76%
53	15	180	0.0833	16.00%	16.00%	28.8	28.8	52%	52%
54	25	224	0.1116	16.00%	16.00%	35.8	35.8	70%	70%
55	37	271	0.1365	16.00%	16.00%	43.4	43.4	85%	85%
56	35	300	0.1167	16.00%	16.00%	48.0	48.0	73%	73%
57	39	323	0.1207	16.00%	16.00%	51.7	51.7	75%	75%
58	59	337	0.1751	20.00%	20.00%	67.4	67.4	88%	88%
59	63	363	0.1736	20.00%	20.00%	72.6	72.6	87%	87%
60	102	409	0.2494	30.00%	25.00%	122.7	102.3	83%	100%
61	98	416	0.2356	30.00%	25.00%	124.8	104.0	79%	94%
62	111	380	0.2921	30.00%	33.00%	114.0	125.4	97%	89%
63	117	334	0.3503	30.00%	33.00%	100.2	110.2	117%	106%
64	75	262	0.2863	30.00%	33.00%	78.6	86.5	95%	87%
65	479	2,078	0.2305	26.00%	28.00%	540.3	581.8	89%	82%
66	430	1,536	0.2799	26.00%	28.00%	399.4	430.1	108%	100%
67	242	1,004	0.2410	22.00%	28.00%	220.9	281.1	110%	86%
68	173	764	0.2264	22.00%	22.00%	168.1	168.1	103%	103%
69	104	579	0.1796	22.00%	22.00%	127.4	127.4	82%	82%
70	117	460	0.2543	22.00%	22.00%	101.2	101.2	116%	116%
71	63	322	0.1957	22.00%	22.00%	70.8	70.8	89%	89%
72	64	253	0.2530	22.00%	22.00%	55.7	55.7	115%	115%
73	35	163	0.2147	22.00%	22.00%	35.9	35.9	98%	98%
74	24	124	0.1935	22.00%	22.00%	27.3	27.3	88%	88%
Subtotal	2,557	11,405				2,687	2,808	95%	91%
75 or more	71	351	0.2023	100.00%	100.00%	351.0	351.0	20%	20%
Totals	2,628	11,756				3,038	3,159	86%	83%

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE STATE EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	7	791	0.0088	2.00%	2.00%	15.8	15.8	44%	44%
50	3	306	0.0098	2.50%	2.50%	7.7	7.7	39%	39%
51	3	320	0.0094	2.50%	2.50%	8.0	8.0	38%	38%
52	4	358	0.0112	2.50%	2.50%	9.0	9.0	45%	45%
53	7	382	0.0183	2.50%	2.50%	9.6	9.6	73%	73%
54	5	379	0.0132	2.50%	2.50%	9.5	9.5	53%	53%
55	7	390	0.0179	4.00%	4.00%	15.6	15.6	45%	45%
56	11	423	0.0260	4.00%	4.00%	16.9	16.9	65%	65%
57	9	463	0.0194	4.00%	4.00%	18.5	18.5	49%	49%
58	16	533	0.0300	4.00%	4.00%	21.3	21.3	75%	75%
59	21	591	0.0355	4.00%	4.00%	23.6	23.6	89%	89%
60	113	1,555	0.0727	10.00%	10.00%	155.5	155.5	73%	73%
61	129	1,531	0.0843	10.00%	10.00%	153.1	153.1	84%	84%
62	423	2,735	0.1547	16.00%	16.00%	437.6	437.6	97%	97%
63	329	2,256	0.1458	16.00%	16.00%	361.0	361.0	91%	91%
64	253	1,850	0.1368	16.00%	16.00%	296.0	296.0	85%	85%
Totals	1,340	14,863				1,559	1,559	86%	86%

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE EDUCATORS

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	0	0	N/A	20.00%	20.00%	-	-	0%	0%
50	1	1	1.0000	20.00%	20.00%	0.2	0.2	500%	500%
51	1	2	0.5000	20.00%	20.00%	0.4	0.4	250%	250%
52	1	8	0.1250	20.00%	20.00%	1.6	1.6	63%	63%
53	4	27	0.1481	20.00%	20.00%	5.4	5.4	74%	74%
54	9	64	0.1406	12.00%	15.00%	7.7	9.6	117%	94%
55	23	130	0.1769	12.00%	15.00%	15.6	19.5	147%	118%
56	15	175	0.0857	12.00%	15.00%	21.0	26.3	71%	57%
57	29	229	0.1266	12.00%	15.00%	27.5	34.4	106%	84%
58	33	257	0.1284	12.00%	15.00%	30.8	38.6	107%	86%
59	35	274	0.1277	12.00%	15.00%	32.9	41.1	106%	85%
60	40	284	0.1408	23.00%	23.00%	65.3	65.3	61%	61%
61	62	274	0.2263	23.00%	23.00%	63.0	63.0	98%	98%
62	78	228	0.3421	30.00%	33.00%	68.4	75.2	114%	104%
63	46	172	0.2674	30.00%	33.00%	51.6	56.8	89%	81%
64	41	130	0.3154	30.00%	33.00%	39.0	42.9	105%	96%
65	76	335	0.2269	30.00%	33.00%	100.5	110.6	76%	69%
66	91	267	0.3408	30.00%	33.00%	80.1	88.1	114%	103%
67	51	179	0.2849	30.00%	30.00%	53.7	53.7	95%	95%
68	38	116	0.3276	30.00%	30.00%	34.8	34.8	109%	109%
69	16	81	0.1975	25.00%	25.00%	20.3	20.3	79%	79%
70	19	64	0.2969	20.00%	20.00%	12.8	12.8	148%	148%
71	12	41	0.2927	20.00%	20.00%	8.2	8.2	146%	146%
72	6	27	0.2222	20.00%	20.00%	5.4	5.4	111%	111%
73	2	19	0.1053	20.00%	20.00%	3.8	3.8	53%	53%
74	3	20	0.1500	20.00%	20.00%	4.0	4.0	75%	75%
Subtotal	732	3,404				754	822	97%	89%
75 or more	7	27	0.2593	100.00%	100.00%	27.0	27.0	26%	26%
Totals	739	3,431				781	849	95%	87%

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE EDUCATORS

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	0	110	0.0000	2.25%	2.00%	2.5	2.2	0%	0%
50	2	172	0.0116	2.25%	2.00%	3.9	3.4	52%	58%
51	1	226	0.0044	2.25%	2.00%	5.1	4.5	20%	22%
52	4	307	0.0130	2.25%	2.00%	6.9	6.1	58%	65%
53	10	353	0.0283	2.75%	2.50%	9.7	8.8	103%	113%
54	6	326	0.0184	2.75%	2.50%	9.0	8.2	67%	74%
55	6	283	0.0212	4.00%	2.75%	11.3	7.8	53%	77%
56	5	234	0.0214	4.00%	2.75%	9.4	6.4	53%	78%
57	3	182	0.0165	4.00%	3.50%	7.3	6.4	41%	47%
58	4	169	0.0237	4.00%	3.50%	6.8	5.9	59%	68%
59	4	165	0.0242	4.00%	3.50%	6.6	5.8	61%	69%
60	20	259	0.0772	10.00%	10.00%	25.9	25.9	77%	77%
61	16	234	0.0684	10.00%	10.00%	23.4	23.4	68%	68%
62	46	322	0.1429	13.00%	13.00%	41.9	41.9	110%	110%
63	41	271	0.1513	13.00%	13.00%	35.2	35.2	116%	116%
64	33	226	0.1460	13.00%	13.00%	29.4	29.4	112%	112%
Totals	201	3,839				234	221	86%	91%

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
FEMALE EDUCATORS

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	1	1	1.0000	30.00%	30.00%	0.3	0.3	333%	333%
50	1	1	1.0000	30.00%	30.00%	0.3	0.3	333%	333%
51	7	19	0.3684	30.00%	30.00%	5.7	5.7	123%	123%
52	28	136	0.2059	30.00%	30.00%	40.8	40.8	69%	69%
53	25	254	0.0984	14.00%	14.00%	35.6	35.6	70%	70%
54	39	374	0.1043	14.00%	14.00%	52.4	52.4	74%	74%
55	46	425	0.1082	14.00%	14.00%	59.5	59.5	77%	77%
56	56	442	0.1267	18.00%	18.00%	79.6	79.6	70%	70%
57	63	444	0.1419	18.00%	18.00%	79.9	79.9	79%	79%
58	84	421	0.1995	18.00%	18.00%	75.8	75.8	111%	111%
59	68	401	0.1696	18.00%	18.00%	72.2	72.2	94%	94%
60	95	365	0.2603	30.00%	30.00%	109.5	109.5	87%	87%
61	95	320	0.2969	30.00%	30.00%	96.0	96.0	99%	99%
62	100	270	0.3704	35.00%	35.00%	94.5	94.5	106%	106%
63	62	210	0.2952	35.00%	35.00%	73.5	73.5	84%	84%
64	66	180	0.3667	30.00%	35.00%	54.0	63.0	122%	105%
65	335	1,202	0.2787	30.00%	35.00%	360.6	420.7	93%	80%
66	299	831	0.3598	30.00%	35.00%	249.3	290.9	120%	103%
67	156	495	0.3152	30.00%	35.00%	148.5	173.3	105%	90%
68	83	319	0.2602	23.00%	23.00%	73.4	73.4	113%	113%
69	58	228	0.2544	23.00%	23.00%	52.4	52.4	111%	111%
70	49	158	0.3101	23.00%	23.00%	36.3	36.3	135%	135%
71	34	101	0.3366	23.00%	23.00%	23.2	23.2	146%	146%
72	19	73	0.2603	23.00%	23.00%	16.8	16.8	113%	113%
73	16	55	0.2909	23.00%	23.00%	12.7	12.7	126%	126%
74	10	39	0.2564	23.00%	23.00%	9.0	9.0	111%	111%
Subtotal	1,895	7,764				1,912	2,047	99%	93%
75 or more	24	69	0.3478	100.00%	100.00%	69.0	69.0	35%	35%
Totals	1,919	7,833				1,981	2,116	97%	91%

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE EDUCATORS

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	5	710	0.0070	2.00%	2.00%	14.2	14.2	35%	35%
50	5	440	0.0114	2.00%	2.00%	8.8	8.8	57%	57%
51	4	551	0.0073	2.00%	2.00%	11.0	11.0	36%	36%
52	10	526	0.0190	3.00%	3.00%	15.8	15.8	63%	63%
53	9	439	0.0205	3.00%	3.00%	13.2	13.2	68%	68%
54	6	381	0.0157	3.00%	3.00%	11.4	11.4	52%	52%
55	9	363	0.0248	4.00%	4.00%	14.5	14.5	62%	62%
56	12	350	0.0343	4.00%	4.00%	14.0	14.0	86%	86%
57	11	381	0.0289	7.00%	7.00%	26.7	26.7	41%	41%
58	19	374	0.0508	7.00%	7.00%	26.2	26.2	73%	73%
59	18	380	0.0474	7.00%	7.00%	26.6	26.6	68%	68%
60	89	913	0.0975	11.00%	11.00%	100.4	100.4	89%	89%
61	90	903	0.0997	11.00%	11.00%	99.3	99.3	91%	91%
62	259	1,593	0.1626	18.00%	18.00%	286.7	286.7	90%	90%
63	226	1,366	0.1654	18.00%	18.00%	245.9	245.9	92%	92%
64	175	1,131	0.1547	18.00%	18.00%	203.6	203.6	86%	86%
Totals	947	10,801				1,118	1,118	85%	85%

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	6	35	0.1714	15.00%	15.00%	5.3	5.3	114%	114%
50	9	54	0.1667	15.00%	15.00%	8.1	8.1	111%	111%
51	12	64	0.1875	15.00%	15.00%	9.6	9.6	125%	125%
52	6	94	0.0638	15.00%	15.00%	14.1	14.1	43%	43%
53	12	131	0.0916	15.00%	15.00%	19.7	19.7	61%	61%
54	12	157	0.0764	15.00%	15.00%	23.6	23.6	51%	51%
55	26	191	0.1361	15.00%	15.00%	28.7	28.7	91%	91%
56	27	218	0.1239	15.00%	15.00%	32.7	32.7	83%	83%
57	23	218	0.1055	15.00%	15.00%	32.7	32.7	70%	70%
58	32	232	0.1379	15.00%	15.00%	34.8	34.8	92%	92%
59	27	235	0.1149	15.00%	15.00%	35.3	35.3	77%	77%
60	24	243	0.0988	20.00%	20.00%	48.6	48.6	49%	49%
61	21	222	0.0946	20.00%	20.00%	44.4	44.4	47%	47%
62	43	212	0.2028	23.00%	23.00%	48.8	48.8	88%	88%
63	39	188	0.2074	23.00%	23.00%	43.2	43.2	90%	90%
64	37	161	0.2298	23.00%	23.00%	37.0	37.0	100%	100%
65	132	650	0.2031	23.00%	23.00%	149.5	149.5	88%	88%
66	148	491	0.3014	30.00%	30.00%	147.3	147.3	100%	100%
67	92	317	0.2902	22.00%	22.00%	69.7	69.7	132%	132%
68	63	233	0.2704	22.00%	22.00%	51.3	51.3	123%	123%
69	34	170	0.2000	22.00%	22.00%	37.4	37.4	91%	91%
70	34	142	0.2394	22.00%	22.00%	31.2	31.2	109%	109%
71	25	101	0.2475	18.00%	18.00%	18.2	18.2	138%	138%
72	12	76	0.1579	18.00%	18.00%	13.7	13.7	88%	88%
73	10	70	0.1429	18.00%	18.00%	12.6	12.6	79%	79%
74	12	51	0.2353	18.00%	18.00%	9.2	9.2	131%	131%
Subtotal	918	4,956				1,006	1,006	91%	91%
75 or more	31	148	0.2095	100.00%	100.00%	148.0	148.0	21%	21%
Totals	949	5,104				1,154	1,154	82%	82%

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	4	416	0.0096	2.50%	2.50%	10.4	10.4	38%	38%
50	2	152	0.0132	2.50%	2.50%	3.8	3.8	53%	53%
51	0	186	0.0000	2.50%	2.50%	4.7	4.7	0%	0%
52	2	203	0.0099	2.50%	2.50%	5.1	5.1	39%	39%
53	6	203	0.0296	2.50%	2.50%	5.1	5.1	118%	118%
54	8	244	0.0328	2.50%	2.50%	6.1	6.1	131%	131%
55	5	241	0.0207	3.00%	3.00%	7.2	7.2	69%	69%
56	5	219	0.0228	3.00%	3.00%	6.6	6.6	76%	76%
57	4	204	0.0196	3.00%	3.00%	6.1	6.1	65%	65%
58	4	200	0.0200	5.00%	5.00%	10.0	10.0	40%	40%
59	5	177	0.0282	5.00%	5.00%	8.9	8.9	56%	56%
60	15	358	0.0419	5.00%	5.00%	17.9	17.9	84%	84%
61	17	334	0.0509	5.00%	5.00%	16.7	16.7	102%	102%
62	68	659	0.1032	13.00%	11.00%	85.7	72.5	79%	94%
63	71	575	0.1235	13.00%	11.00%	74.8	63.3	95%	112%
64	41	482	0.0851	13.00%	11.00%	62.7	53.0	65%	77%
Totals	257	4,853				332	297	78%	86%

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	0	12	0.0000	20.00%	20.00%	2.4	2.4	0%	0%
50	3	23	0.1304	20.00%	20.00%	4.6	4.6	65%	65%
51	3	35	0.0857	20.00%	20.00%	7.0	7.0	43%	43%
52	3	44	0.0682	20.00%	20.00%	8.8	8.8	34%	34%
53	12	61	0.1967	20.00%	20.00%	12.2	12.2	98%	98%
54	8	67	0.1194	20.00%	20.00%	13.4	13.4	60%	60%
55	8	70	0.1143	25.00%	25.00%	17.5	17.5	46%	46%
56	15	86	0.1744	25.00%	25.00%	21.5	21.5	70%	70%
57	10	91	0.1099	25.00%	25.00%	22.8	22.8	44%	44%
58	13	95	0.1368	25.00%	25.00%	23.8	23.8	55%	55%
59	20	106	0.1887	25.00%	25.00%	26.5	26.5	75%	75%
60	12	99	0.1212	30.00%	30.00%	29.7	29.7	40%	40%
61	14	111	0.1261	30.00%	30.00%	33.3	33.3	42%	42%
62	21	103	0.2039	30.00%	30.00%	30.9	30.9	68%	68%
63	29	86	0.3372	30.00%	30.00%	25.8	25.8	112%	112%
64	21	75	0.2800	30.00%	30.00%	22.5	22.5	93%	93%
65	173	693	0.2496	25.00%	25.00%	173.3	173.3	100%	100%
66	139	514	0.2704	25.00%	25.00%	128.5	128.5	108%	108%
67	94	363	0.2590	25.00%	25.00%	90.8	90.8	104%	104%
68	58	262	0.2214	25.00%	25.00%	65.5	65.5	89%	89%
69	44	187	0.2353	25.00%	25.00%	46.8	46.8	94%	94%
70	34	127	0.2677	20.00%	20.00%	25.4	25.4	134%	134%
71	23	86	0.2674	15.00%	15.00%	12.9	12.9	178%	178%
72	18	71	0.2535	15.00%	15.00%	10.7	10.7	169%	169%
73	7	62	0.1129	15.00%	15.00%	9.3	9.3	75%	75%
74	11	53	0.2075	15.00%	15.00%	8.0	8.0	138%	138%
Subtotal	793	3,582				874	874	91%	91%
75 or more	30	130	0.2308	100.00%	100.00%	130.0	130.0	23%	23%
Totals	823	3,712				1,004	1,004	82%	82%

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	11	293	0.0375	2.00%	3.00%	5.9	8.8	188%	125%
50	2	82	0.0244	3.00%	4.00%	2.5	3.3	81%	61%
51	1	86	0.0116	3.00%	4.00%	2.6	3.4	39%	29%
52	3	95	0.0316	3.00%	4.00%	2.9	3.8	105%	79%
53	0	90	0.0000	3.00%	4.00%	2.7	3.6	0%	0%
54	5	102	0.0490	4.00%	4.00%	4.1	4.1	123%	123%
55	2	114	0.0175	4.00%	4.00%	4.6	4.6	44%	44%
56	3	102	0.0294	4.00%	4.00%	4.1	4.1	74%	74%
57	3	125	0.0240	4.00%	4.00%	5.0	5.0	60%	60%
58	5	142	0.0352	6.00%	6.00%	8.5	8.5	59%	59%
59	5	127	0.0394	6.00%	6.00%	7.6	7.6	66%	66%
60	34	385	0.0883	6.00%	10.00%	23.1	38.5	147%	88%
61	44	364	0.1209	12.00%	13.00%	43.7	47.3	101%	93%
62	95	773	0.1229	12.00%	13.00%	92.8	100.5	102%	95%
63	65	652	0.0997	12.00%	13.00%	78.2	84.8	83%	77%
64	86	588	0.1463	12.00%	13.00%	70.6	76.4	122%	113%
Totals	364	4,120				359	404	101%	90%

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE < 20
PUBLIC SAFETY EMPLOYEES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
60	9	100	0.0900	12.00%	12.00%	12.0	12.0	75%	75%
61	6	77	0.0779	12.00%	12.00%	9.2	9.2	65%	65%
62	8	69	0.1159	12.00%	12.00%	8.3	8.3	97%	97%
63	11	59	0.1864	12.00%	12.00%	7.1	7.1	155%	155%
64	10	40	0.2500	12.00%	12.00%	4.8	4.8	208%	208%
65	6	43	0.1395	25.00%	25.00%	10.8	10.8	56%	56%
66	5	32	0.1563	25.00%	25.00%	8.0	8.0	63%	63%
67	6	22	0.2727	25.00%	25.00%	5.5	5.5	109%	109%
68	5	14	0.3571	25.00%	25.00%	3.5	3.5	143%	143%
69	1	7	0.1429	25.00%	25.00%	1.8	1.8	57%	57%
Subtotal	67	463				71	71	94%	94%
70 or more	4	22	0.1818	100.00%	100.00%	22	22	18%	18%
Totals	71	485				93	93	76%	76%

Summary of Data and Experience

RETIREMENT EXPERIENCE 20 ≤ SERVICE < 30
PUBLIC SAFETY EMPLOYEES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	2	16	0.1250	15.00%	15.00%	2.4	2.4	83%	83%
41	11	55	0.2000	15.00%	15.00%	8.3	8.3	133%	133%
42	25	153	0.1634	15.00%	15.00%	23.0	23.0	109%	109%
43	51	240	0.2125	15.00%	15.00%	36.0	36.0	142%	142%
44	53	317	0.1672	15.00%	15.00%	47.6	47.6	111%	111%
45	48	379	0.1266	15.00%	15.00%	56.9	56.9	84%	84%
46	50	413	0.1211	15.00%	15.00%	62.0	62.0	81%	81%
47	63	435	0.1448	15.00%	15.00%	65.3	65.3	97%	97%
48	47	427	0.1101	15.00%	15.00%	64.1	64.1	73%	73%
49	52	410	0.1268	15.00%	15.00%	61.5	61.5	85%	85%
50	47	389	0.1208	15.00%	15.00%	58.4	58.4	81%	81%
51	41	354	0.1158	15.00%	15.00%	53.1	53.1	77%	77%
52	27	327	0.0826	15.00%	15.00%	49.1	49.1	55%	55%
53	31	287	0.1080	15.00%	15.00%	43.1	43.1	72%	72%
54	29	260	0.1115	15.00%	15.00%	39.0	39.0	74%	74%
55	29	216	0.1343	15.00%	15.00%	32.4	32.4	90%	90%
56	25	186	0.1344	15.00%	15.00%	27.9	27.9	90%	90%
57	18	163	0.1104	15.00%	15.00%	24.5	24.5	74%	74%
58	24	145	0.1655	15.00%	15.00%	21.8	21.8	110%	110%
59	16	133	0.1203	15.00%	15.00%	20.0	20.0	80%	80%
60	14	127	0.1102	20.00%	20.00%	25.4	25.4	55%	55%
61	18	113	0.1593	20.00%	20.00%	22.6	22.6	80%	80%
62	22	96	0.2292	30.00%	30.00%	28.8	28.8	76%	76%
63	22	69	0.3188	30.00%	30.00%	20.7	20.7	106%	106%
64	13	38	0.3421	30.00%	30.00%	11.4	11.4	114%	114%
65	8	34	0.2353	30.00%	30.00%	10.2	10.2	78%	78%
66	12	30	0.4000	30.00%	30.00%	9.0	9.0	133%	133%
67	11	19	0.5789	30.00%	30.00%	5.7	5.7	193%	193%
68	4	10	0.4000	30.00%	30.00%	3.0	3.0	133%	133%
69	4	7	0.5714	30.00%	30.00%	2.1	2.1	190%	190%
Subtotal	817	5,848				935	935	87%	87%
70 or more	6	10	0.6000	100.00%	100.00%	10	10	60%	60%
Totals	823	5,858				945	945	87%	87%

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE ≥ 30
PUBLIC SAFETY EMPLOYEES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	0	0	N/A	20.00%	15.00%	0.0	0.0	0%	0%
46	0	0	N/A	20.00%	15.00%	0.0	0.0	0%	0%
47	0	0	N/A	20.00%	15.00%	0.0	0.0	0%	0%
48	0	0	N/A	20.00%	15.00%	0.0	0.0	0%	0%
49	0	1	0.0000	20.00%	15.00%	0.2	0.2	0%	0%
50	0	3	0.0000	20.00%	15.00%	0.6	0.5	0%	0%
51	2	9	0.2222	20.00%	15.00%	1.8	1.4	111%	148%
52	3	25	0.1200	20.00%	15.00%	5.0	3.8	60%	80%
53	8	41	0.1951	20.00%	15.00%	8.2	6.2	98%	130%
54	4	44	0.0909	20.00%	15.00%	8.8	6.6	45%	61%
55	8	55	0.1455	20.00%	15.00%	11.0	8.3	73%	97%
56	9	67	0.1343	20.00%	15.00%	13.4	10.1	67%	90%
57	14	67	0.2090	20.00%	15.00%	13.4	10.1	104%	139%
58	8	61	0.1311	20.00%	15.00%	12.2	9.2	66%	87%
59	5	56	0.0893	20.00%	20.00%	11.2	11.2	45%	45%
60	11	60	0.1833	20.00%	20.00%	12.0	12.0	92%	92%
61	6	57	0.1053	20.00%	20.00%	11.4	11.4	53%	53%
62	14	54	0.2593	35.00%	35.00%	18.9	18.9	74%	74%
63	15	40	0.3750	35.00%	35.00%	14.0	14.0	107%	107%
64	6	27	0.2222	35.00%	35.00%	9.5	9.5	63%	63%
65	7	25	0.2800	50.00%	35.00%	12.5	8.8	56%	80%
66	9	21	0.4286	50.00%	50.00%	10.5	10.5	86%	86%
67	6	12	0.5000	50.00%	50.00%	6.0	6.0	100%	100%
68	1	5	0.2000	50.00%	50.00%	2.5	2.5	40%	40%
69	2	4	0.5000	50.00%	50.00%	2.0	2.0	100%	100%
Subtotal	138	734				185	163	75%	85%
70 or more	0	5	0.0000	100.00%	100.00%	5	5	0%	0%
Totals	138	739				190	168	73%	82%

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE < 30
FIREFIGHTERS - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	0	5	0.0000	10.00%	10.00%	0.5	0.5	0%	0%
41	1	9	0.1111	10.00%	10.00%	0.9	0.9	111%	111%
42	1	19	0.0526	10.00%	10.00%	1.9	1.9	53%	53%
43	3	30	0.1000	10.00%	10.00%	3.0	3.0	100%	100%
44	2	49	0.0408	10.00%	10.00%	4.9	4.9	41%	41%
45	2	71	0.0282	10.00%	10.00%	7.1	7.1	28%	28%
46	5	78	0.0641	10.00%	10.00%	7.8	7.8	64%	64%
47	8	91	0.0879	5.00%	5.00%	4.6	4.6	176%	176%
48	1	91	0.0110	5.00%	5.00%	4.6	4.6	22%	22%
49	4	85	0.0471	5.00%	5.00%	4.3	4.3	94%	94%
50	6	88	0.0682	5.00%	5.00%	4.4	4.4	136%	136%
51	3	101	0.0297	5.00%	5.00%	5.1	5.1	59%	59%
52	8	89	0.0899	5.00%	5.00%	4.5	4.5	180%	180%
53	7	83	0.0843	10.00%	10.00%	8.3	8.3	84%	84%
54	9	67	0.1343	10.00%	10.00%	6.7	6.7	134%	134%
55	4	72	0.0556	10.00%	10.00%	7.2	7.2	56%	56%
56	5	70	0.0714	10.00%	10.00%	7.0	7.0	71%	71%
57	6	63	0.0952	10.00%	10.00%	6.3	6.3	95%	95%
58	9	50	0.1800	10.00%	10.00%	5.0	5.0	180%	180%
59	6	44	0.1364	10.00%	10.00%	4.4	4.4	136%	136%
60	5	51	0.0980	10.00%	10.00%	5.1	5.1	98%	98%
61	6	39	0.1538	10.00%	10.00%	3.9	3.9	154%	154%
62	2	25	0.0800	25.00%	25.00%	6.3	6.3	32%	32%
63	5	19	0.2632	25.00%	25.00%	4.8	4.8	105%	105%
64	2	11	0.1818	25.00%	25.00%	2.8	2.8	73%	73%
65	0	8	0.0000	50.00%	50.00%	4.0	4.0	0%	0%
66	5	7	0.7143	50.00%	50.00%	3.5	3.5	143%	143%
67	0	1	0.0000	50.00%	50.00%	0.5	0.5	0%	0%
68	0	2	0.0000	50.00%	50.00%	1.0	1.0	0%	0%
69	0	1	0.0000	50.00%	50.00%	0.5	0.5	0%	0%
70	0	1	0.0000	100.00%	100.00%	1.0	1.0	0%	0%
Total	115	1,420				132	132	87%	87%

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE ≥ 30
FIREFIGHTERS - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	0	0	N/A	0.00%	0.00%	0.0	0.0	0%	0%
41	0	0	N/A	0.00%	0.00%	0.0	0.0	0%	0%
42	0	0	N/A	0.00%	0.00%	0.0	0.0	0%	0%
43	0	0	N/A	0.00%	0.00%	0.0	0.0	0%	0%
44	0	0	N/A	0.00%	0.00%	0.0	0.0	0%	0%
45	0	0	N/A	15.00%	15.00%	0.0	0.0	0%	0%
46	0	0	N/A	15.00%	15.00%	0.0	0.0	0%	0%
47	0	0	N/A	15.00%	15.00%	0.0	0.0	0%	0%
48	0	0	N/A	15.00%	15.00%	0.0	0.0	0%	0%
49	1	2	0.5000	15.00%	15.00%	0.3	0.3	333%	333%
50	0	3	0.0000	15.00%	15.00%	0.5	0.5	0%	0%
51	0	5	0.0000	15.00%	15.00%	0.8	0.8	0%	0%
52	1	6	0.1667	15.00%	15.00%	0.9	0.9	111%	111%
53	1	9	0.1111	15.00%	15.00%	1.4	1.4	74%	74%
54	3	17	0.1765	15.00%	15.00%	2.6	2.6	118%	118%
55	3	19	0.1579	20.00%	15.00%	3.8	2.9	79%	105%
56	3	19	0.1579	20.00%	15.00%	3.8	2.9	79%	105%
57	7	24	0.2917	20.00%	15.00%	4.8	3.6	146%	194%
58	5	29	0.1724	20.00%	20.00%	5.8	5.8	86%	86%
59	3	30	0.1000	20.00%	20.00%	6.0	6.0	50%	50%
60	8	32	0.2500	22.50%	20.00%	7.2	6.4	111%	125%
61	5	25	0.2000	22.50%	20.00%	5.6	5.0	89%	100%
62	5	29	0.1724	25.00%	25.00%	7.3	7.3	69%	69%
63	4	26	0.1538	25.00%	25.00%	6.5	6.5	62%	62%
64	4	24	0.1667	25.00%	25.00%	6.0	6.0	67%	67%
65	6	16	0.3750	50.00%	50.00%	8.0	8.0	75%	75%
66	3	8	0.3750	50.00%	50.00%	4.0	4.0	75%	75%
67	0	4	0.0000	50.00%	50.00%	2.0	2.0	0%	0%
68	0	2	0.0000	50.00%	50.00%	1.0	1.0	0%	0%
69	1	1	1.0000	50.00%	50.00%	0.5	0.5	200%	200%
70	0	0	N/A	100.00%	100.00%	0.0	0.0	0%	0%
Totals	63	330				79	74	80%	85%

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE < 25
JUDGES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
62	2	18	0.1111	25.00%	20.00%	4.5	3.6	44%	56%
63	2	16	0.1250	25.00%	20.00%	4.0	3.2	50%	63%
64	2	12	0.1667	25.00%	20.00%	3.0	2.4	67%	83%
65	1	7	0.1429	20.00%	20.00%	1.4	1.4	71%	71%
66	3	6	0.5000	20.00%	20.00%	1.2	1.2	250%	250%
67	1	6	0.1667	20.00%	20.00%	1.2	1.2	83%	83%
68	2	4	0.5000	20.00%	20.00%	0.8	0.8	250%	250%
69	0	3	0.0000	20.00%	20.00%	0.6	0.6	0%	0%
70	0	3	0.0000	100.00%	100.00%	3.0	3.0	0%	0%
Total	13	75				20	17	66%	75%

Summary of Data and Experience

RETIREMENT EXPERIENCE 25 ≤ SERVICE < 30
JUDGES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	0	0	N/A	10.00%	10.00%	0	0	0%	0%
46	0	0	N/A	10.00%	10.00%	0	0	0%	0%
47	0	0	N/A	10.00%	10.00%	0	0	0%	0%
48	0	0	N/A	10.00%	10.00%	0	0	0%	0%
49	0	0	N/A	10.00%	10.00%	0	0	0%	0%
50	0	1	0.0000	10.00%	10.00%	0.1	0.1	0%	0%
51	0	1	0.0000	10.00%	10.00%	0.1	0.1	0%	0%
52	0	3	0.0000	10.00%	10.00%	0.3	0.3	0%	0%
53	0	3	0.0000	10.00%	10.00%	0.3	0.3	0%	0%
54	0	2	0.0000	10.00%	10.00%	0.2	0.2	0%	0%
55	0	2	0.0000	10.00%	10.00%	0.2	0.2	0%	0%
56	0	4	0.0000	10.00%	10.00%	0.4	0.4	0%	0%
57	0	4	0.0000	10.00%	10.00%	0.4	0.4	0%	0%
58	0	4	0.0000	10.00%	10.00%	0.4	0.4	0%	0%
59	0	6	0.0000	10.00%	10.00%	0.6	0.6	0%	0%
60	0	6	0.0000	10.00%	10.00%	0.6	0.6	0%	0%
61	1	8	0.1250	10.00%	10.00%	0.8	0.8	125%	125%
62	0	4	0.0000	20.00%	10.00%	0.8	0.4	0%	0%
63	1	4	0.2500	20.00%	10.00%	0.8	0.4	125%	250%
64	0	1	0.0000	20.00%	15.00%	0.2	0.2	0%	0%
65	1	4	0.2500	20.00%	15.00%	0.8	0.6	125%	167%
66	0	2	0.0000	20.00%	20.00%	0.4	0.4	0%	0%
67	0	2	0.0000	20.00%	20.00%	0.4	0.4	0%	0%
68	1	2	0.5000	20.00%	20.00%	0.4	0.4	250%	250%
69	1	2	0.5000	20.00%	20.00%	0.4	0.4	250%	250%
70	0	1	0.0000	100.00%	100.00%	1.0	1.0	0%	0%
Total	5	66				10	9	52%	58%

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE ≥ 30
JUDGES - MALES AND FEMALES COMBINED

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	0	0	N/A	10.00%	10.00%	0	0	0%	0%
46	0	0	N/A	10.00%	10.00%	0	0	0%	0%
47	0	0	N/A	10.00%	10.00%	0	0	0%	0%
48	0	0	N/A	10.00%	10.00%	0	0	0%	0%
49	0	0	N/A	10.00%	10.00%	0	0	0%	0%
50	0	0	N/A	10.00%	10.00%	0	0	0%	0%
51	0	0	N/A	10.00%	10.00%	0	0	0%	0%
52	0	0	N/A	10.00%	10.00%	0	0	0%	0%
53	0	0	N/A	10.00%	10.00%	0	0	0%	0%
54	0	0	N/A	10.00%	10.00%	0	0	0%	0%
55	0	1	0.0000	10.00%	10.00%	0.1	0.1	0%	0%
56	0	1	0.0000	10.00%	10.00%	0.1	0.1	0%	0%
57	0	1	0.0000	10.00%	10.00%	0.1	0.1	0%	0%
58	1	3	0.3333	10.00%	10.00%	0.3	0.3	333%	333%
59	0	2	0.0000	10.00%	10.00%	0.2	0.2	0%	0%
60	0	3	0.0000	10.00%	10.00%	0.3	0.3	0%	0%
61	2	4	0.5000	10.00%	10.00%	0.4	0.4	500%	500%
62	0	5	0.0000	20.00%	10.00%	1.0	0.5	0%	0%
63	0	4	0.0000	20.00%	10.00%	0.8	0.4	0%	0%
64	0	2	0.0000	20.00%	15.00%	0.4	0.3	0%	0%
65	0	5	0.0000	20.00%	15.00%	1.0	0.8	0%	0%
66	1	4	0.2500	20.00%	20.00%	0.8	0.8	125%	125%
67	0	4	0.0000	20.00%	20.00%	0.8	0.8	0%	0%
68	0	5	0.0000	20.00%	20.00%	1.0	1.0	0%	0%
69	0	6	0.0000	20.00%	20.00%	1.2	1.2	0%	0%
70	1	4	0.2500	100.00%	100.00%	4.0	4.0	25%	25%
Totals	5	54				13	11	40%	44%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
STATE EMPLOYEES

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	7.55%	8.75%	8.60%
1	7.08%	8.00%	7.85%
2	5.99%	7.00%	6.85%
3	5.64%	6.25%	6.10%
4	5.12%	6.00%	5.85%
5	4.79%	5.50%	5.35%
6	4.44%	5.25%	5.10%
7	4.39%	5.00%	4.85%
8	4.04%	5.00%	4.85%
9	4.13%	4.75%	4.60%
10	3.97%	4.75%	4.60%
11	3.79%	4.50%	4.35%
12	3.74%	4.50%	4.35%
13	3.66%	4.50%	4.35%
14	3.45%	4.25%	4.10%
15	3.36%	4.00%	3.85%
16	3.23%	4.00%	3.85%
17	3.27%	4.00%	3.85%
18	3.24%	4.00%	3.85%
19	3.24%	4.00%	3.85%
20	3.08%	3.75%	3.60%
21	2.96%	3.75%	3.60%
22	3.03%	3.75%	3.60%
23	3.02%	3.75%	3.60%
24	2.87%	3.50%	3.35%
25 and up	2.78%	3.50%	3.35%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
EDUCATORS

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	8.72%	10.50%	10.35%
1	7.83%	9.50%	9.35%
2	6.60%	8.50%	8.35%
3	6.64%	8.00%	7.85%
4	6.30%	7.75%	7.60%
5	6.13%	7.50%	7.35%
6	5.97%	7.50%	7.35%
7	5.91%	7.25%	7.10%
8	5.63%	7.00%	6.85%
9	5.28%	6.75%	6.60%
10	4.96%	6.25%	6.10%
11	4.53%	5.75%	5.60%
12	4.08%	5.50%	5.35%
13	3.78%	5.00%	4.85%
14	3.47%	4.75%	4.60%
15	3.30%	4.50%	4.35%
16	3.13%	4.25%	4.10%
17	2.99%	4.00%	3.85%
18	3.06%	4.00%	3.85%
19	2.98%	4.00%	3.85%
20	2.81%	4.00%	3.85%
21	2.66%	4.00%	3.85%
22	2.76%	4.00%	3.85%
23	2.82%	4.00%	3.85%
24	2.65%	3.75%	3.60%
25 and up	2.38%	3.50%	3.35%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
LOCAL GOVERNMENT

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	7.64%	9.50%	8.85%
1	6.60%	8.00%	7.35%
2	6.05%	7.25%	6.60%
3	5.57%	6.75%	6.10%
4	5.20%	6.25%	5.60%
5	4.86%	6.00%	5.35%
6	4.58%	5.75%	5.10%
7	4.54%	5.50%	4.85%
8	4.34%	5.25%	4.60%
9	4.21%	5.25%	4.60%
10	3.84%	5.00%	4.35%
11	3.71%	4.75%	4.10%
12	3.72%	4.75%	4.10%
13	3.53%	4.75%	4.35%
14	3.56%	4.75%	4.35%
15	3.42%	4.75%	4.35%
16	3.37%	4.50%	4.10%
17	3.35%	4.50%	4.10%
18	3.32%	4.50%	4.10%
19	3.06%	4.50%	4.10%
20	3.12%	4.25%	3.85%
21	3.03%	4.00%	3.60%
22	3.05%	4.00%	3.60%
23	2.71%	3.75%	3.35%
24	2.76%	3.75%	3.35%
25 and up	2.77%	3.75%	3.35%

SALARY INCREASE EXPERIENCE
PUBLIC SAFETY

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	6.50%	8.25%	7.85%
1	6.01%	7.25%	6.85%
2	5.91%	7.00%	6.60%
3	5.50%	6.75%	6.35%
4	5.51%	6.50%	6.10%
5	5.33%	6.25%	5.85%
6	5.31%	6.25%	5.85%
7	4.92%	6.00%	5.60%
8	4.94%	5.75%	5.35%
9	4.95%	5.75%	5.35%
10	4.64%	5.50%	5.10%
11	4.30%	5.25%	4.85%
12	4.13%	5.00%	4.60%
13	4.02%	5.00%	4.60%
14	3.93%	4.75%	4.35%
15	3.96%	4.75%	4.35%
16	3.76%	4.75%	4.35%
17	3.61%	4.50%	4.10%
18	3.57%	4.50%	4.10%
19	3.64%	4.50%	4.10%
20	3.48%	4.50%	4.10%
21	3.36%	4.25%	3.85%
22	3.25%	4.25%	3.85%
23	2.91%	4.00%	3.60%
24	3.35%	4.00%	3.60%
25 and up	2.88%	3.75%	3.35%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
FIREFIGHTERS

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	6.53%	9.50%	8.85%
1	6.26%	8.00%	7.35%
2	5.81%	7.25%	6.60%
3	5.67%	6.75%	6.10%
4	6.47%	6.25%	5.60%
5	6.07%	6.00%	5.35%
6	6.76%	5.75%	5.10%
7	5.85%	5.50%	4.85%
8	5.66%	5.25%	4.60%
9	5.26%	5.25%	4.60%
10	4.85%	5.00%	4.35%
11	4.13%	4.75%	4.10%
12	3.78%	4.75%	5.10%
13	3.62%	4.75%	4.10%
14	3.53%	4.75%	4.10%
15	3.28%	4.75%	4.60%
16	3.30%	4.50%	4.60%
17	2.93%	4.50%	4.35%
18	2.92%	4.50%	4.10%
19	2.88%	4.50%	4.10%
20	2.49%	4.25%	4.10%
21	2.74%	4.00%	3.85%
22	2.52%	4.00%	3.60%
23	2.37%	3.75%	3.60%
24	2.39%	3.75%	3.60%
25 and up	2.14%	3.75%	3.35%

APPENDIX A

SUMMARY OF PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Proposed Actuarial Assumptions and Methods

1. *Investment return rate*:

   7.00% per annum, compounded annually, composed of a 2.50% inflation rate and a 4.50% net real rate of return, which includes administrative expenses of 0.06% per year.

2. *Active member mortality rates*:

   The base table used for active members is the RP-2014 Employees Mortality Table with White Collar Adjustment. Multipliers were applied to the base active member mortality rates by occupation and were developed based on plan experience. For the Public Safety and Firefighters Systems, 25% of deaths are assumed to be service related. Rates at selected ages are shown:

	Active Male Members	
Age	Public Educators	All Public Employees Except Educators
20	0.000228	0.000285
25	0.000271	0.000339
30	0.000254	0.000317
35	0.000294	0.000367
40	0.000352	0.000440
45	0.000546	0.000682
50	0.000946	0.001182
55	0.001564	0.001955
60	0.002630	0.003288
65	0.004644	0.005805
70	0.008223	0.010279

	Active Female Members		
Age	Public Educators	Public Safety and Firefighters	All Other Public Employees
20	0.000069	0.000137	0.000110
25	0.000073	0.000146	0.000117
30	0.000092	0.000184	0.000147
35	0.000121	0.000241	0.000193
40	0.000167	0.000334	0.000267
45	0.000277	0.000554	0.000443
50	0.000465	0.000930	0.000744
55	0.000706	0.001412	0.001130
60	0.001030	0.002060	0.001648
65	0.001560	0.003119	0.002495
70	0.002717	0.005433	0.004346

3. *Disability rates*:

Disability rates are a function of the member's sex, occupation, and age. These rates were developed based on plan experience. Rates are applied at all ages. For the Public Safety and Firefighters Systems, 25% of disabilities are assumed to be service related. Rates at selected ages are shown:

	Active Male Members				
Age	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
20	0.000200	0.000200	0.000090	0.000240	0.000420
25	0.000300	0.000300	0.000135	0.000360	0.000630
30	0.000600	0.000600	0.000270	0.000720	0.001260
35	0.000900	0.000900	0.000405	0.001080	0.001890
40	0.001200	0.001200	0.000540	0.001440	0.002520
45	0.002000	0.002000	0.000900	0.002400	0.004200
50	0.002600	0.002600	0.001170	0.003120	0.005460
55	0.004100	0.004100	0.001845	0.004920	0.008610
60	0.005600	0.005600	0.002520	0.006720	0.011760

	Active Female Members				
Age	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
20	0.000170	0.000170	0.000120	0.000240	0.000420
25	0.000255	0.000255	0.000180	0.000360	0.000630
30	0.000510	0.000510	0.000360	0.000720	0.001260
35	0.000765	0.000765	0.000540	0.001080	0.001890
40	0.001020	0.001020	0.000720	0.001440	0.002520
45	0.001700	0.001700	0.001200	0.002400	0.004200
50	0.002210	0.002210	0.001560	0.003120	0.005460
55	0.003485	0.003485	0.002460	0.004920	0.008610
60	0.004760	0.004760	0.003360	0.006720	0.011760

4. *Termination rates (for causes other than death, disability or retirement)*:

Termination rates are a function of the member's sex, occupation, and service. These rates were developed based on plan experience. Termination rates are not applied after a member becomes eligible for a reduced or unreduced retirement benefit.

	Active Male Members				
	Years of Service				
Service	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
0	0.1700	0.2500	0.1400	0.1200	0.0600
1	0.1300	0.2000	0.1100	0.0800	0.0500
2	0.0900	0.1400	0.0800	0.0650	0.0400
3	0.0800	0.1000	0.0700	0.0600	0.0350
4	0.0750	0.1000	0.0650	0.0500	0.0300
5	0.0700	0.1000	0.0600	0.0450	0.0250
6	0.0650	0.0900	0.0550	0.0425	0.0225
7	0.0600	0.0750	0.0400	0.0400	0.0200
8	0.0550	0.0600	0.0350	0.0350	0.0175
9	0.0475	0.0550	0.0300	0.0325	0.0150
10	0.0450	0.0500	0.0275	0.0300	0.0150
11	0.0400	0.0450	0.0250	0.0275	0.0150
12	0.0350	0.0400	0.0250	0.0250	0.0050
13	0.0300	0.0375	0.0225	0.0225	0.0050
14	0.0300	0.0350	0.0200	0.0150	0.0050
15	0.0275	0.0300	0.0200	0.0150	0.0050
16	0.0275	0.0275	0.0175	0.0150	0.0050
17	0.0275	0.0250	0.0175	0.0150	0.0050
18	0.0250	0.0200	0.0175	0.0150	0.0050
19	0.0250	0.0200	0.0150	0.0150	0.0050
20	0.0200	0.0200	0.0100	0.0100	0.0050
21	0.0200	0.0200	0.0100	0.0100	0.0050
22	0.0175	0.0200	0.0100	0.0100	0.0050
23	0.0150	0.0150	0.0100	0.0100	0.0050
24	0.0125	0.0150	0.0100	0.0100	0.0050
25+	0.0100	0.0100	0.0100	0.0100	0.0050

Summary of Proposed Actuarial Assumptions and Methods

4. *Termination rates (continued)*:

	Active Female Members				
	Years of Service				
Service	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
0	0.2200	0.2800	0.1600	0.1200	0.0600
1	0.1800	0.2300	0.1500	0.0800	0.0500
2	0.1300	0.1700	0.1200	0.0650	0.0400
3	0.1100	0.1300	0.1000	0.0600	0.0350
4	0.1050	0.1250	0.0900	0.0500	0.0300
5	0.1000	0.1100	0.0800	0.0450	0.0250
6	0.0950	0.1000	0.0750	0.0425	0.0225
7	0.0900	0.0750	0.0600	0.0400	0.0200
8	0.0750	0.0650	0.0500	0.0350	0.0175
9	0.0700	0.0600	0.0450	0.0325	0.0150
10	0.0600	0.0550	0.0400	0.0300	0.0150
11	0.0550	0.0475	0.0350	0.0275	0.0150
12	0.0525	0.0450	0.0325	0.0250	0.0050
13	0.0500	0.0425	0.0300	0.0225	0.0050
14	0.0450	0.0375	0.0250	0.0150	0.0050
15	0.0400	0.0350	0.0225	0.0150	0.0050
16	0.0375	0.0300	0.0200	0.0150	0.0050
17	0.0350	0.0275	0.0175	0.0150	0.0050
18	0.0300	0.0275	0.0150	0.0150	0.0050
19	0.0300	0.0275	0.0125	0.0150	0.0050
20	0.0250	0.0275	0.0125	0.0100	0.0050
21	0.0250	0.0250	0.0125	0.0100	0.0050
22	0.0225	0.0225	0.0125	0.0100	0.0050
23	0.0200	0.0200	0.0125	0.0100	0.0050
24	0.0200	0.0200	0.0125	0.0100	0.0050
25+	0.0100	0.0100	0.0100	0.0100	0.0050

5. *Refund rates*:

Refund rates are the percentage of vested members electing to receive a refund of contributions upon termination of employment. This rate is only applied to members of the contributory systems; vested members in the noncontributory systems are assumed to defer their benefits until retirement, even if they have a contribution account from service prior to the establishment of the noncontributory system. The rate is a function of the member's sex, occupation and service. These rates are based on plan experience.

Males				
Service	**Local Government**	**Public Employees**	**Public Educators**	**Public Safety & Firefighters[1]**
0-3	100%	100%	100%	100%
4	75%	86%	75%	76%
5	73%	83%	73%	74%
6	70%	80%	70%	71%
7	67%	78%	66%	69%
8	65%	77%	61%	67%
9	62%	75%	57%	65%
10	61%	73%	54%	57%
11	59%	70%	50%	50%
12	58%	68%	47%	42%
13	55%	66%	42%	40%
14	52%	65%	38%	37%
15	49%	63%	33%	35%
16	48%	61%	28%	33%
17	46%	60%	22%	31%
18	45%	58%	17%	29%
19	23%	29%	09%	15%
20 or more	00%	00%	00%	00%

[1] Male and female members combined.

Summary of Proposed Actuarial Assumptions and Methods

5. *Refund rates (continued)*:

Females			
Service	**Local Government**	**Public Employees**	**Public Educators**
0-3	100%	100%	100%
4	77%	80%	65%
5	75%	79%	64%
6	72%	77%	62%
7	69%	74%	61%
8	67%	71%	59%
9	64%	68%	58%
10	61%	64%	53%
11	57%	60%	48%
12	54%	56%	43%
13	49%	55%	39%
14	45%	53%	36%
15	40%	52%	32%
16	35%	49%	27%
17	30%	46%	21%
18	25%	43%	16%
19	13%	22%	08%
20 or more	00%	00%	00%

6. *Retirement rates*:

Retirement rates are a function of the member's age, sex and occupation (and service in the case of Firefighters, Public Safety and Judges). Rates are based on plan experience. Rates are applied only at ages at which the member is eligible for a reduced or unreduced retirement benefit. Members are assumed to retire no later than age 75 (age 70 for the public safety, firefighter and judges systems). Sample rates are shown below.

Tier I - Local Government				
	Male		Female	
Age	Reduced	Unreduced	Reduced	Unreduced
50	0.025	0.150	0.040	0.200
51	0.025	0.150	0.040	0.200
52	0.025	0.150	0.040	0.200
53	0.025	0.150	0.040	0.200
54	0.025	0.150	0.040	0.200
55	0.030	0.150	0.040	0.250
56	0.030	0.150	0.040	0.250
57	0.030	0.150	0.040	0.250
58	0.050	0.150	0.060	0.250
59	0.050	0.150	0.060	0.250
60	0.050	0.200	0.100	0.300
61	0.050	0.200	0.130	0.300
62	0.110	0.230	0.130	0.300
63	0.110	0.230	0.130	0.300
64	0.110	0.230	0.130	0.300
65	N/A	0.230	N/A	0.250
66	N/A	0.300	N/A	0.250
67	N/A	0.220	N/A	0.250
68	N/A	0.220	N/A	0.250
69	N/A	0.220	N/A	0.250
70	N/A	0.220	N/A	0.200
71	N/A	0.180	N/A	0.150
72	N/A	0.180	N/A	0.150
73	N/A	0.180	N/A	0.150
74	N/A	0.180	N/A	0.150
75+	N/A	1.000	N/A	1.000

6. *Retirement rates (continued)*:

Tier II - Local Government				
	Male		Female	
Age	Reduced	Unreduced[1]	Reduced	Unreduced[1]
50	N/A	0.150	N/A	0.200
51	N/A	0.150	N/A	0.200
52	N/A	0.150	N/A	0.200
53	N/A	0.150	N/A	0.200
54	N/A	0.150	N/A	0.200
55	N/A	0.150	N/A	0.250
56	N/A	0.150	N/A	0.250
57	N/A	0.150	N/A	0.250
58	N/A	0.150	N/A	0.250
59	N/A	0.150	N/A	0.250
60	0.020	0.200	0.020	0.300
61	0.040	0.200	0.040	0.300
62	0.060	0.230	0.060	0.300
63	0.080	0.230	0.080	0.300
64	0.100	0.230	0.100	0.300
65	N/A	0.230	N/A	0.250
66	N/A	0.300	N/A	0.250
67	N/A	0.220	N/A	0.250
68	N/A	0.220	N/A	0.250
69	N/A	0.220	N/A	0.250
70	N/A	0.220	N/A	0.200
71	N/A	0.180	N/A	0.150
72	N/A	0.180	N/A	0.150
73	N/A	0.180	N/A	0.150
74	N/A	0.180	N/A	0.150
75+	N/A	1.000	N/A	1.000

[1] The retirement rate at the age the member is first eligible for an unreduced retirement benefit prior to the age of 65 is increased by 30%.

6. *Retirement rates (continued)*:

Tier I - Public Employees				
	Male		Female	
Age	Reduced	Unreduced	Reduced	Unreduced
50	0.023	0.150	0.025	0.170
51	0.023	0.150	0.025	0.160
52	0.025	0.150	0.025	0.160
53	0.025	0.150	0.025	0.160
54	0.025	0.150	0.025	0.160
55	0.025	0.160	0.040	0.160
56	0.040	0.160	0.040	0.160
57	0.040	0.160	0.040	0.160
58	0.040	0.160	0.040	0.200
59	0.050	0.160	0.040	0.200
60	0.075	0.200	0.100	0.250
61	0.075	0.200	0.100	0.250
62	0.130	0.300	0.160	0.330
63	0.130	0.300	0.160	0.330
64	0.130	0.300	0.160	0.330
65	N/A	0.220	N/A	0.280
66	N/A	0.220	N/A	0.280
67	N/A	0.220	N/A	0.280
68	N/A	0.220	N/A	0.220
69	N/A	0.220	N/A	0.220
70	N/A	0.220	N/A	0.220
71	N/A	0.220	N/A	0.220
72	N/A	0.220	N/A	0.220
73	N/A	0.220	N/A	0.220
74	N/A	0.220	N/A	0.220
75+	N/A	1.000	N/A	1.000

6. *Retirement rates (continued)*:

Tier II - Public Employees				
	Male		Female	
Age	Reduced	Unreduced[1]	Reduced	Unreduced[1]
50	N/A	0.150	N/A	0.170
51	N/A	0.150	N/A	0.160
52	N/A	0.150	N/A	0.160
53	N/A	0.150	N/A	0.160
54	N/A	0.150	N/A	0.160
55	N/A	0.160	N/A	0.160
56	N/A	0.160	N/A	0.160
57	N/A	0.160	N/A	0.160
58	N/A	0.160	N/A	0.200
59	N/A	0.160	N/A	0.200
60	0.020	0.200	0.020	0.300
61	0.040	0.200	0.040	0.300
62	0.060	0.330	0.060	0.300
63	0.080	0.330	0.080	0.300
64	0.100	0.300	0.100	0.300
65	N/A	0.220	N/A	0.260
66	N/A	0.220	N/A	0.260
67	N/A	0.220	N/A	0.220
68	N/A	0.220	N/A	0.220
69	N/A	0.220	N/A	0.220
70	N/A	0.220	N/A	0.220
71	N/A	0.220	N/A	0.220
72	N/A	0.220	N/A	0.220
73	N/A	0.220	N/A	0.220
74	N/A	0.220	N/A	0.220
75+	N/A	1.000	N/A	1.000

[1] The retirement rate at the age the member is first eligible for an unreduced retirement benefit prior to the age of 65 is increased by 30%.

6. *Retirement rates (continued)*:

Tier I - Public Educators				
	Male		Female	
Age	Reduced	Unreduced	Reduced	Unreduced
50	0.020	0.200	0.020	0.300
51	0.020	0.200	0.020	0.300
52	0.020	0.200	0.030	0.300
53	0.025	0.200	0.030	0.140
54	0.025	0.150	0.030	0.140
55	0.028	0.150	0.040	0.140
56	0.028	0.150	0.040	0.180
57	0.035	0.150	0.070	0.180
58	0.035	0.150	0.070	0.180
59	0.035	0.150	0.070	0.180
60	0.100	0.230	0.110	0.300
61	0.100	0.230	0.110	0.300
62	0.130	0.330	0.180	0.350
63	0.130	0.330	0.180	0.350
64	0.130	0.330	0.180	0.350
65	N/A	0.330	N/A	0.350
66	N/A	0.330	N/A	0.350
67	N/A	0.300	N/A	0.350
68	N/A	0.300	N/A	0.230
69	N/A	0.250	N/A	0.230
70	N/A	0.200	N/A	0.230
71	N/A	0.200	N/A	0.230
72	N/A	0.200	N/A	0.230
73	N/A	0.200	N/A	0.230
74	N/A	0.200	N/A	0.230
75+	N/A	1.000	N/A	1.000

Summary of Proposed Actuarial Assumptions and Methods

6. *Retirement rates (continued)*:

Tier II - Public Educators				
	Male		Female	
Age	Reduced	Unreduced[1]	Reduced	Unreduced[1]
50	N/A	0.200	N/A	0.300
51	N/A	0.200	N/A	0.300
52	N/A	0.200	N/A	0.300
53	N/A	0.200	N/A	0.140
54	N/A	0.120	N/A	0.140
55	N/A	0.120	N/A	0.140
56	N/A	0.120	N/A	0.180
57	N/A	0.120	N/A	0.180
58	N/A	0.120	N/A	0.180
59	N/A	0.120	N/A	0.180
60	0.020	0.230	0.020	0.300
61	0.040	0.230	0.040	0.300
62	0.060	0.300	0.060	0.350
63	0.080	0.300	0.080	0.350
64	0.100	0.300	0.100	0.300
65	N/A	0.300	N/A	0.300
66	N/A	0.300	N/A	0.300
67	N/A	0.300	N/A	0.300
68	N/A	0.300	N/A	0.230
69	N/A	0.250	N/A	0.230
70	N/A	0.200	N/A	0.230
71	N/A	0.200	N/A	0.230
72	N/A	0.200	N/A	0.230
73	N/A	0.200	N/A	0.230
74	N/A	0.200	N/A	0.230
75+	N/A	1.000	N/A	1.000

[1] The retirement rate at the age the member is first eligible for an unreduced retirement benefit prior to the age of 65 is increased by 30%.

6. *Retirement rates (continued)*:

Tier I - Public Safety (Unisex)				Tier I - Firefighters (Unisex)	
	Years of Service			Years of Service	
Age	0 – 19	20 – 29	30+	0 – 29	30+
40-44	0.000	0.150	0.150	0.100	0.150
45	0.000	0.150	0.150	0.100	0.150
46	0.000	0.150	0.150	0.100	0.150
47	0.000	0.150	0.150	0.050	0.150
48	0.000	0.150	0.150	0.050	0.150
49	0.000	0.150	0.150	0.050	0.150
50	0.000	0.150	0.150	0.050	0.150
51	0.000	0.150	0.150	0.050	0.150
52	0.000	0.150	0.150	0.050	0.150
53	0.000	0.150	0.150	0.100	0.150
54	0.000	0.150	0.150	0.100	0.150
55	0.000	0.150	0.150	0.100	0.150
56	0.000	0.150	0.150	0.100	0.150
57	0.000	0.150	0.150	0.100	0.150
58	0.000	0.150	0.150	0.100	0.200
59	0.000	0.150	0.200	0.100	0.200
60	0.120	0.200	0.200	0.100	0.200
61	0.120	0.200	0.200	0.100	0.200
62	0.120	0.300	0.350	0.250	0.250
63	0.120	0.300	0.350	0.250	0.250
64	0.120	0.300	0.350	0.250	0.250
65	0.250	0.300	0.350	0.500	0.500
66	0.250	0.300	0.500	0.500	0.500
67	0.250	0.300	0.500	0.500	0.500
68	0.250	0.300	0.500	0.500	0.500
69	0.250	0.300	0.500	0.500	0.500
70+	1.000	1.000	1.000	1.000	1.000

6. *Retirement rates (continued)*:

	Tier II - Public Safety (Unisex)			Tier II - Firefighters (Unisex)	
	Years of Service			Years of Service	
Age	0 – 19[1]	20 - 29[1]	30+	0 - 29[1]	30+
40-44	N/A	0.090	N/A	0.060	N/A
45	N/A	0.090	0.120	0.060	0.090
46	N/A	0.090	0.120	0.060	0.090
47	N/A	0.090	0.120	0.030	0.090
48	N/A	0.090	0.120	0.030	0.090
49	N/A	0.090	0.120	0.030	0.090
50	N/A	0.090	0.120	0.030	0.090
51	N/A	0.090	0.120	0.030	0.090
52	N/A	0.090	0.120	0.030	0.090
53	N/A	0.090	0.120	0.060	0.090
54	N/A	0.090	0.120	0.060	0.090
55	N/A	0.090	0.120	0.060	0.120
56	N/A	0.090	0.120	0.060	0.120
57	N/A	0.090	0.120	0.060	0.120
58	N/A	0.090	0.120	0.060	0.120
59	N/A	0.090	0.120	0.060	0.120
60	N/A	0.250	0.250	0.200	0.400
61	N/A	0.300	0.300	0.200	0.400
62	0.120	0.350	0.350	0.300	0.400
63	0.120	0.350	0.350	0.300	0.400
64	0.120	0.350	0.350	0.300	0.400
65	0.250	0.500	0.500	0.600	0.600
66	0.250	0.500	0.500	0.600	0.600
67	0.250	0.500	0.500	0.600	0.600
68	0.250	0.500	0.500	0.600	0.600
69	0.250	0.500	0.500	0.600	0.600
70+	1.000	1.000	1.000	1.000	1.000

[1]Retirement rates for reduced retirements are 50% of the rates shown in the table above.

6. *Retirement rates (continued)*:

Judges - Males and Females			
	Years of Service		
Age	0 - 24	25 - 29	30+
45	N/A	0.100	0.100
46	N/A	0.100	0.100
47	N/A	0.100	0.100
48	N/A	0.100	0.100
49	N/A	0.100	0.100
50	N/A	0.100	0.100
51	N/A	0.100	0.100
52	N/A	0.100	0.100
53	N/A	0.100	0.100
54	N/A	0.100	0.100
55	N/A	0.100	0.100
56	N/A	0.100	0.100
57	N/A	0.100	0.100
58	N/A	0.100	0.100
59	N/A	0.100	0.100
60	N/A	0.100	0.100
61	N/A	0.100	0.100
62	0.200	0.100	0.100
63	0.200	0.100	0.100
64	0.200	0.150	0.150
65	0.200	0.150	0.150
66	0.200	0.200	0.200
67	0.200	0.200	0.200
68	0.200	0.200	0.200
69	0.200	0.200	0.200
70	1.000	1.000	1.000

7. *Salary increase rates*:

Salaries for individual members are assumed to increase each year, as a function of the member's occupation and service. Rates are composed of a 2.50% inflation rate, a 0.75% general increase rate that applies to all, and a variable promotional/longevity component that is a function of the member's service.

Active Male and Female Members - Local Government		
Years of Service	**Annual Promotional/Longevity Rates of Increase**	**Total Annual Rate of Increase Including 3.50% Wage Inflation**
0	5.50%	8.75%
1	4.00	7.25
2	3.25	6.50
3	2.75	6.00
4	2.25	5.50
5	2.00	5.25
6	1.75	5.00
7	1.50	4.75
8	1.25	4.50
9	1.25	4.50
10	1.00	4.25
11	0.75	4.00
12	0.75	4.00
13	0.75	4.00
14	0.75	4.00
15	0.75	4.00
16	0.50	3.75
17	0.50	3.75
18	0.50	3.75
19	0.50	3.75
20	0.25	3.50
21	0.25	3.50
22	0.25	3.50
23	0.00	3.25
24	0.00	3.25
25 or more	0.00	3.25

Summary of Proposed Actuarial Assumptions and Methods

7. *Salary increase rates (continued)*:

Active Male and Female Members - Public Employees		
Years of Service	**Annual Promotional/Longevity Rates of Increase**	**Total Annual Rate of Increase Including 3.50% Wage Inflation**
0	5.25%	8.50%
1	4.50	7.75
2	3.50	6.75
3	2.75	6.00
4	2.50	5.75
5	2.00	5.25
6	1.75	5.00
7	1.50	4.75
8	1.50	4.75
9	1.25	4.50
10	1.25	4.50
11	1.00	4.25
12	1.00	4.25
13	1.00	4.25
14	0.75	4.00
15	0.50	3.75
16	0.50	3.75
17	0.50	3.75
18	0.50	3.75
19	0.50	3.75
20	0.25	3.50
21	0.25	3.50
22	0.25	3.50
23	0.25	3.50
24	0.00	3.25
25 or more	0.00	3.25

Summary of Proposed Actuarial Assumptions and Methods

7. *Salary increase rates (continued)*:

Active Male and Female Members Public Educators		
Years of Service	**Annual Promotional/Longevity Rates of Increase**	**Total Annual Rate of Increase Including 3.50% Wage Inflation**
0	6.50%	9.75%
1	5.75	9.00
2	4.75	8.00
3	4.25	7.50
4	4.00	7.25
5	3.75	7.00
6	3.75	7.00
7	3.50	6.75
8	3.50	6.75
9	3.25	6.50
10	2.75	6.00
11	2.25	5.50
12	2.00	5.25
13	1.50	4.75
14	1.25	4.50
15	1.00	4.25
16	0.75	4.00
17	0.50	3.75
18	0.50	3.75
19	0.50	3.75
20	0.50	3.75
21	0.50	3.75
22	0.50	3.75
23	0.50	3.75
24	0.25	3.50
25 or more	0.00	3.25

Summary of Proposed Actuarial Assumptions and Methods

7. *Salary increase rates (continued)*:

Active Male and Female Members Public Safety		
Years of Service	**Annual Promotional/Longevity Rates of Increase**	**Total Annual Rate of Increase Including 3.50% Wage Inflation**
0	4.00%	7.25%
1	3.00	6.25
2	2.75	6.00
3	2.50	5.75
4	2.50	5.75
5	2.50	5.75
6	2.50	5.75
7	2.25	5.50
8	2.00	5.25
9	2.00	5.25
10	1.75	5.00
11	1.50	4.75
12	1.25	4.50
13	1.25	4.50
14	1.00	4.25
15	1.00	4.25
16	1.00	4.25
17	0.75	4.00
18	0.75	4.00
19	0.75	4.00
20	0.75	4.00
21	0.50	3.75
22	0.50	3.75
23	0.25	3.50
24	0.25	3.50
25 or more	0.00	3.25

Summary of Proposed Actuarial Assumptions and Methods

7. *Salary increase rates (continued)*:

Active Male and Female Members Firefighters		
Years of Service	**Annual Promotional/Longevity Rates of Increase**	**Total Annual Rate of Increase Including 3.50% Wage Inflation**
0	5.50%	8.75%
1	5.00	8.25
2	4.75	8.00
3	4.50	7.75
4	4.25	7.50
5	4.00	7.25
6	4.00	7.25
7	3.50	6.75
8	3.25	6.50
9	3.00	6.25
10	2.50	5.75
11	1.75	5.00
12	1.75	5.05
13	1.25	4.50
14	1.25	4.50
15	1.25	4.50
16	1.25	4.50
17	1.00	4.25
18	0.75	4.00
19	0.75	4.00
20	0.75	4.00
21	0.50	3.75
22	0.25	3.50
23	0.25	3.50
24	0.25	3.50
25 or more	0.00	3.25

8. *Annuitant mortality rates (nondisabled retirees)*:

All non-educator groups except judges:
Male retirees: 110% of 2017 PR UTAH Retiree Mortality Table for males, projected with Scale AA from 2017.
Female retirees: 110% of 2017 PR UTAH Retiree Mortality Table for females, projected with Scale AA from 2017.
Educators and judges:
Male retirees: 90% of 2017 PR UTAH Retiree Mortality Table for males, projected with Scale AA from 2017.
Female retirees: 90% of 2017 PR UTAH Retiree Mortality Table for females, projected with Scale AA from 2017.

Mortality Rates in Base Tables before Projection (Multipliers Applied)				
	Non-educators except judges		Educators and judges	
Age	Males	Females	Males	Females
50	0.001757	0.001152	0.001437	0.000942
55	0.002578	0.001657	0.002110	0.001355
60	0.004168	0.002918	0.003410	0.002388
65	0.007647	0.005546	0.006257	0.004538
70	0.013862	0.010542	0.011342	0.008626
75	0.025332	0.019797	0.020726	0.016197
80	0.046859	0.037778	0.038339	0.030910
85	0.086326	0.072093	0.070630	0.058985
90	0.159026	0.138685	0.130112	0.113469

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
	Year of Retirement				
Group	2020	2025	2030	2035	2040
Noneducators - Male	21.0	21.3	21.6	22.0	22.3
Noneducators - Female	22.1	22.3	22.5	22.6	22.8
Educators/Judges - Male	22.4	22.8	23.1	23.4	23.7
Educators/Judges - Female	23.5	23.7	23.9	24.1	24.2

9. *Disabled annuitant mortality rates*:

Males: 110% of the RP-2014 for Disabled Males, projected with Scale AA from 2006.
Females: 120% of the RP-2014 for Disabled Females, projected with Scale AA from 2006.

Disabled Mortality Rates in Base Table before Projections (Multipliers Applied)		
Age	**Males**	**Females**
20	0.000669	0.000302
25	0.002522	0.001150
30	0.005596	0.002624
35	0.010072	0.005334
40	0.016701	0.009401
45	0.022935	0.012733
50	0.026335	0.014926
55	0.027353	0.018016
60	0.030922	0.023351
65	0.039943	0.030359
70	0.053693	0.041104
75	0.073711	0.058944
80	0.103687	0.087108
85	0.150812	0.130198
90	0.225018	0.190367

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
	Year of Retirement				
Gender	**2020**	**2025**	**2030**	**2035**	**2035**
Males	13.6	14.1	14.6	15.1	15.6
Females	15.0	15.2	15.5	15.7	16.0

10. *Actuarial cost method*:

The Entry Age Normal actuarial cost method is used. This method is designed to produce a relatively level funding pattern when expressed as a percent of pay.

First, the actuarial present value of all future expected benefits is determined for each member, including retired members, beneficiaries, inactive members and active members. This takes into account both the probability that a benefit will be paid at a given age and the time value of money. The sum of these amounts--the Present Value of Future Benefits (PVFB)--is then determined.

Next, the Entry Age Normal actuarial cost method is used to allocate the PVFB between the current year (the normal cost), prior years (the Actuarial Accrued Liability), and future years (future normal costs). The current and future normal costs are determined as a level percentage of pay, except that for the Legislators and Governors plan, which is not pay related, normal costs are determined as a level dollar amount.

A portion of the normal cost may be paid by employee contributions in which case the balance becomes the normal cost portion of the employer contribution rate.

The difference between the Actuarial Accrued Liability (the portion of the total actuarial present value of future benefits allocated to prior years) and the Actuarial Value of Assets is called the Unfunded Actuarial Accrued Liability (UAAL). This is funded over 20 years from the valuation date.

The total employer cost rate is the sum of (i) the normal cost rate, net of employee contributions if applicable, and (ii) the level percent-of-pay amortization of the UAAL. For the Judges' System and the Firefighters' System, certain specified revenues (court fees and a tax on fire insurance premiums, respectively) are used as an offset to the employer contribution rate each year, as described elsewhere in this report.

All contribution rates are based upon monthly payments of contributions.

11. *Actuarial value of assets*:

The actuarial value of assets is equal to the market value, adjusted for a five-year phase in of actual investment return in excess of (or less than) expected investment return. The actual return is calculated net of investment and administrative expenses, and the expected investment return is equal to the assumed investment return rate multiplied by the prior year's market value of assets, adjusted for contributions, benefits paid, and refunds. The actuarial value of assets is further adjusted, if necessary, so that it is not less than 75% of market value and not more than 125% of market value.

12. *Payroll growth rate*:

In determining the level percent of payroll amortization rate, payroll is assumed to grow annually at 3.00%. The payroll growth assumption is 0.00% for the Higher Ed risk pools and the Governors and Legislative Pension Plan.

13. *Marital status*:

All nonretired members are assumed to be married with no children. Female members are assumed to be three years younger than their spouses, while male members are assumed to be three years older than their spouses.

14. *Administrative and investment expenses*:

The assumed 7.00% investment return rate represents the anticipated net return after payment of all investment and administrative expenses. Administrative expenses are assumed to be 0.06% of plan assets each year.

15. *Judges System*:

For the Judges System, no disability or withdrawal rates were used. Salaries are assumed to increase at 3.25% per year.

16. *Governors and Legislative Pension Plan*:

A 10% withdrawal rate is assumed regardless of age or service. No disability rates are used. No salary increase rate is used because the benefits do not reflect pay. Members are assumed to retire at the earlier of (i) age 65 with four years of service, or (ii) age 62 with 10 years of service. Normal cost and actuarial accrued liability are based on Level Dollar Entry Age Cost Method (not Level Percent of Pay).

17. *Interest Credited on Member Contribution Account Balances:*

In projecting member contribution account balances, we assume that the rate credited is 7.00% each year. (The actual rate is set by the Board of Trustees annually, based on investment performance.) Interest is not credited to account balances for members of the Firefighters Retirement System.

18. *Mortality Improvement:*

For post-retirement mortality, both healthy and disabled, we assume continuous (generational) mortality improvement according to Scale AA from a base year of 2000. Mortality improvement is ignored for the pre-retirement mortality assumption, since it would not have a material effect on the liabilities.

19. *LTD Benefit Protection Contracts*:

It is assumed that all members of the Tier I Public Employee Retirement Systems are covered by an LTD Benefit Protection Contract. LTD benefit protection contract coverage for the Tier II Hybrid Retirement Systems (Public Employees and Public Safety and Firefighters) is being valued for those members who are employed by a participating employer that elected to provide coverage to their workforce.

20. *Cost-of-living increases:*

Retirement benefits for all systems with a maximum 4.00% COLA are assumed to increase at 2.50% even though the maximum allowable rate is 4.00%. Retirement benefits for the funds with a maximum 2.50% COLA—e.g., some of the Public Safety funds—are assumed to increase at the maximum allowable rate of 2.50%.

For current retirees who have received cumulative COLAs less than the total of annual CPI increases since retirement, we assume higher COLAs, subject to the annual maximum, as long as the member has "banked" CPI increases left.