Utah Retirement Systems

Actuarial Experience Study

For the Period Ending December 31, 2022

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August 10, 2022

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Subject: Results of 2023 Actuarial Experience Study for URS

We are pleased to present our report on the results of the 2023 Actuarial Experience Study for the Utah Retirement Systems (URS). This report is generally based on plan experience for the period ending December 31, 2022.

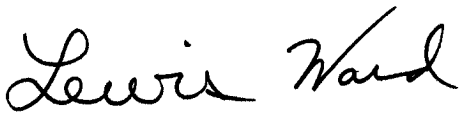
This report includes summaries and analyses of the experience data. Based on these analyses, we have recommended a new set of actuarial assumptions to be effective for the January 1, 2023 actuarial valuation. In addition, the report provides the estimated effect on the actuarial liabilities and contribution rates if our recommendations are adopted.

In accordance with the Board's policy, an experience study that reviews the economic and demographic assumptions is performed every three years. 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 and Ms. Shaw meet the Qualification Standards of the American Academy of Actuaries. All 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
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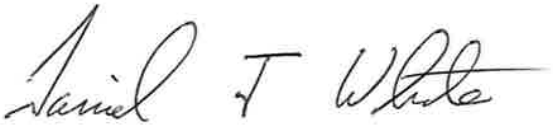

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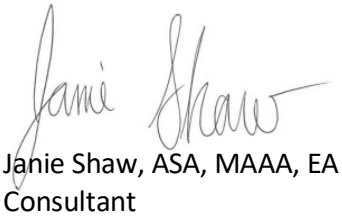

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Consultant

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SECTION A

EXECUTIVE SUMMARY

Executive Summary

1. Purpose
   a. Review all current demographic actuarial assumptions and methods and compare to actual recent experience.
   b. Generally used data from the five-year period ending December 31, 2022 (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. Current assumption is 2.50%.
   b. It is a component of the investment return assumption, salary increase assumption, COLA assumption, and assumed payroll growth rate.
   c. Recommend continued use of a 2.50% price inflation assumption.

3. Annual investment return rate
   a. Current assumption is 6.85% per annum.
   b. Assumed annual rate represents total return, net of administrative and investment expenses and is composed of a 2.50% inflation rate and a 4.35% net real rate of return.
   c. We recommend no change the current 6.85% investment return assumption. However, we believe lowering the assumed rate of return would also be reasonable.

4. COLA assumption
   a. Current assumption is 2.50%, for funds with a 2.50% and 4.00% annual COLA max and for funds.
   b. Actual increase based on annual change in price inflation, i.e. CPI-U and consistent with the price inflation assumption used in the actuarial valuation.
   c. Recommend continued use of 2.50% COLA assumption.

5. Salary increase rate
    a. Separate assumptions currently used for state employees, local government employees, teachers, public safety, and firefighters.
    b. Current 3.25% wage inflation equals price inflation plus 0.75% for productivity increases.
    c. Includes additional merit-based increases for shorter service employees.
    d. Recommend an increase in the productivity component to 1.25% for the public safety members and 1.00% for all other groups. Also recommend increases at several service intervals for the employee 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 2.90%.
    c. Only affects contribution rates, not actuarial liabilities.
    d. We recommend no change to the 2.90% payroll growth assumption.

7. Post-retirement mortality for healthy retirees:
    a. Current assumption is based on URS retiree experience through December 31, 2019. We also use a multiplier adjustment for any differences between the different employee groups (such as educators and general employees). Mortality is assumed to improve using 80% of the ultimate improvement rates in Scale MP-2019.
    b. Performed an analysis based on nine years of experience, which includes three years with retiree exposure to COVID-19. Experience shows, that mortality for all retiree groups was slightly higher than expected.
    c. We recommend continued use of the custom 2020 base retiree mortality table. However, we recommend updating the mortality improvement assumption to be the ultimate improvement rates in Scale MP-2020.

8. Disabled mortality:
    a. Current assumption is based on the PUB-2010 mortality table for Disabled Annuitants with projected improvement using 80% of the ultimate improvement rates in Scale MP-2019.
    b. Relatively few disabled retirees compared to the number of service retirees.
    c. Recommend continued use of the base mortality table to PUB-2010 mortality table for Disabled lives. Increase the multiplier used for males from 115% to 120% (no change for females). Finally, we recommend updating the improvement assumption to be the ultimate improvement rates in Scale MP-2020.

9. Pre-termination mortality:
    a. Recommend continued use of the PUB-2010 Employee mortality tables that are matched to employee type (i.e. teachers, general employees, public safety).
    b. This is a low-significance assumption.

10. Disability incidence:
    a. Recommend reduction in assumed disability rates for all membership groups except for public safety members. No change to the assumption for public safety members.

11. Retirement:
    a. The experience shows that the current retirement assumption reasonably models the retirement behavior for members eligible for unreduced retirement and our recommended retirement assumption has only minor adjustments where the retirement rates were increased at some ages for educators and local government members.
    b. The rates of retirement for members in the Tier II public employee hybrid fund remains unchanged. The rates of retirement for members in the Tier II public safety and firefighters hybrid fund remains the same as the comparable retirement rates for Tier I members (with an adjustment for first retirement eligibility).

12. Termination:
    a. Used to model the behavior of members leaving their employer prior to being eligible to commence a retirement benefit for reasons other than disability or death.
    b. Analysis shows that actual terminations were more than currently assumed, but we recommend maintaining this margin of conservatism in this assumption. Specifically, we recommend slight increases to the termination rates for local government employees, public safety members, and firefighters. We recommend slight decreases in the rate of termination for educators to eliminate some excessive margin. No changes for state employee termination rates.

13. Marriage assumption:
    a. Current assumption: 100% of members are married.
    b. Used in valuing active member death benefits
    c. Census data suggest the current assumption is reasonable and we are not recommending a change.

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 for most funds are determined using a maximum 20-year amortization period (some funds have a different closed amortization period).
    b. The actuarially determined contribution rate is a floor contribution requirement.
    c. Current statute allows for the Board to certify the contribution rate at the greater of the prior year's certified 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 to continue to be determined in future years using a 20-year period (i.e. 20-year open) for the funds except those that currently have a closed funding period (e.g. the Governors and Legislators Pension Plan and the higher education funds).
    e. We recommend the continued use of a closed funding period for the Higher Education funds (14 years as of January 1, 2023).

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.

In accordance with URS Board policy, an experience study is performed every three years. The last one was prepared in conjunction with the January 1, 2020 actuarial valuation. For this experience study, we have reviewed and analyzed URS's data for the five-year period from December 31, 2017 through December 31, 2022. Note that the first two years, calendar years 2018 and 2019, 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 provisions 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 most assumptions.

In a few instances, such as the analysis of individual salary increases and the rates at which active members withdrawal from active service, 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.

Introduction

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 or years of service, by the "exposures" at that same age or service band. 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. Note, this example is a headcount-based approach. This experience study uses various "weighted" approaches to more closely mimic the liability impact of each assumption. See Section C for additional discussion of the basis used to review each assumption.

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 smooths 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 a 3.50% wage inflation assumption is appropriate, others might argue that a different rate is a better assumption.

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 containing all 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 78, we show the exhibit analyzing the termination rates for male educators. The second column shows the sum of the salary of all male teachers who terminated during the study period. This excludes members who died, became disabled, or retired. Column (3) shows the total exposures. This is the sum of the salary of all 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 ten-year period. Column (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 number of terminations, weighted by salary, 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.

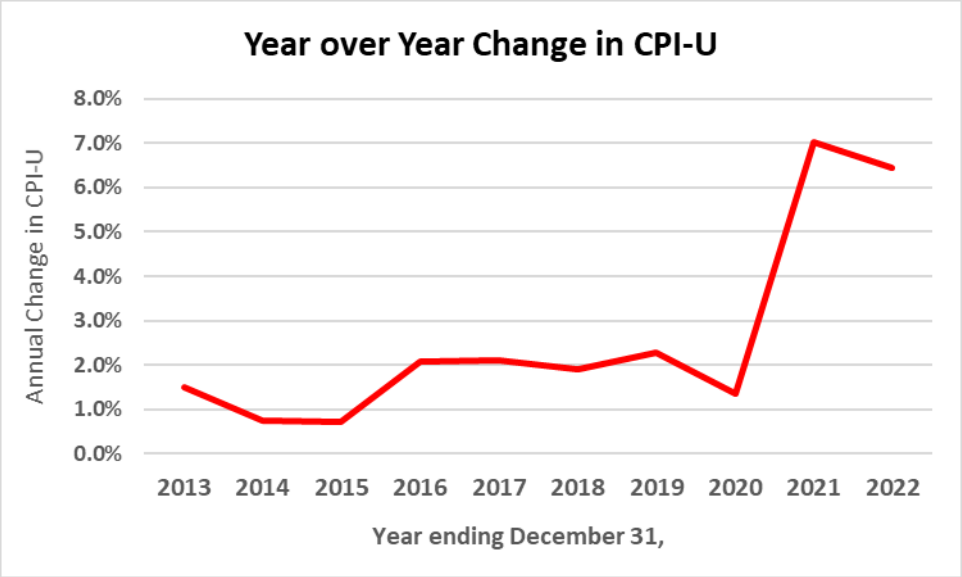
Inflation rate

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 2.50%.

We recognize that actual inflation as measured by CPI has been much higher than the current 2.50% assumption during the last 24 months, however the Federal Reserve has broadcasted repeatedly the Committee seeks to achieve an inflation rate of 2.00% over the longer run. The Committee has raised the Fed Funds rate aggressively over the last 18-months and their effort appears to paying off as the price inflation has been trending down and was 3.00% for the month of June 2023.

Analysis of Experience and Recommendations

The following chart shows the year over year change in CPI-U over the last 10 years ending December 31, 2022:



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

As the charts show, with the exception of the last two years, inflation has been benign. Through the first six months of 2023 the year-over-year inflation has continued to decrease to 3.00% through June.

The following is a discussion of the various sources of forward-looking inflation expectations.

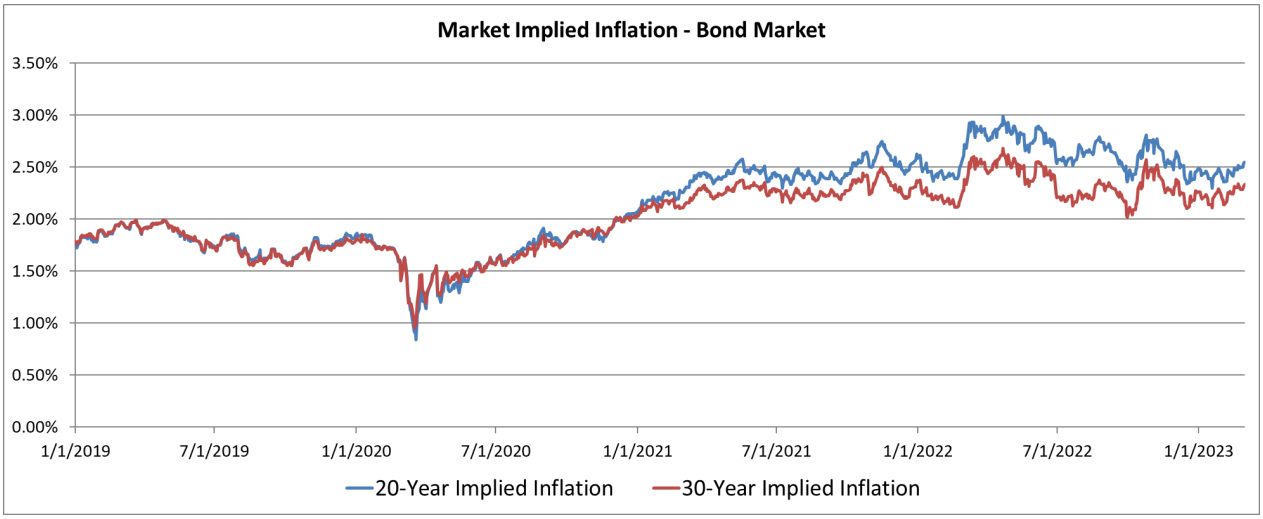
Forward-Looking Expectations Developed by Investment Consulting Firms

Most investment consulting firms, in setting their capital market assumptions, make a price inflation assumption as a building block for developing forward-looking return expectations. Based on a survey of 2023 capital market assumptions of nine investment consulting firms, the average expected price inflation for the next ten years is 2.40%. Of these nine, the minimum expectation was 2.00% (one of the nine firms) and the maximum was 2.50% (five of the nine firms).

Expectations Implied in the Bond Market

Another source of information about future inflation is the market for US Treasury bonds. For example, the March 1, 2023 yield for 20-year inflation indexed Treasury bonds was 1.58% plus actual inflation. The yield for 20-year non-indexed US Treasury bonds was 4.17%. Simplistically, this means that on that day the bond market was predicting that inflation over the next twenty years would average 2.55% [(1 + 4.17%) / (1 + 1.58%) - 1] per year. The difference in yield for 30-year bonds implies 2.33% inflation over the next 30 years. This is consistent with most forecasts that inflation is expected to be higher for the next few years before settling down near the Federal Reserve's 2.00% target. Below is a chart with the history of the implied inflation for 20-year and 30-year Treasury securities from January 2019 through February 2023. However, this analysis is known

to be imperfect as it ignores the inflation risk premium that buyers of US Treasury bonds often demand as well as possible differences in liquidity between US Treasury bonds and TIPS.



Forecasts from Social Security Administration

In the Social Security Administration's 2023 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.40% under the intermediate cost assumption and low cost and high cost scenarios are 1.80% and 3.00%, respectively. The Chief Actuary for the Social Security Administration has kept this assumption unchanged for the last three years.

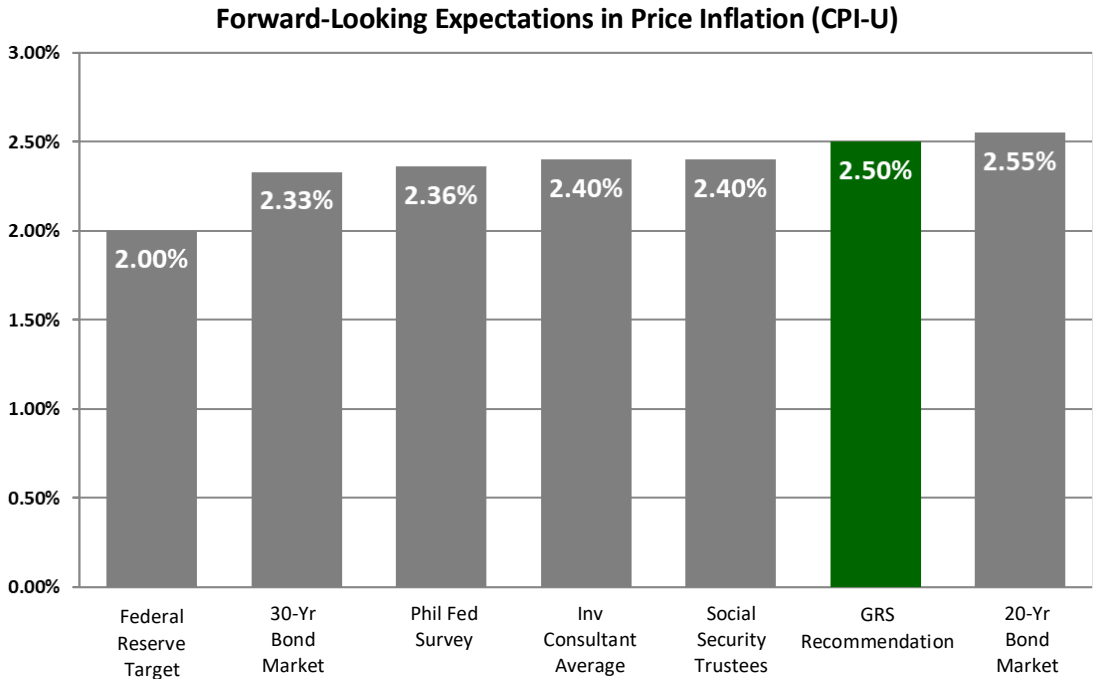
Survey of Professional Forecasters

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their forecast for the second quarter of 2023 was for inflation over the next ten years (2023 to 2032) to average 2.36%. This survey average was relatively unchanged from the 2.37% expectation in the first quarter of 2023 and 2.80% for the fourth quarter 2022 survey.

Analysis of Experience and Recommendations

Recommendation

The following is a chart to summarize the various forward-looking expectations.



Using these sources, we recommend the continued use of a 2.50% assumption. However, we would also support the Board if it wanted to increase the inflation assumption to 2.75%. Increasing the inflation assumption would result in an increase in the COLA assumption for Tier 1 public employees and the Tier 1 public safety funds with a 4.00% COLA.

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 3 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 6.85% 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 2.50% per annum and an annual real rate of return of 4.35%, net of expenses.

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	7.3%
Last 10 Years	8.1%
Last 15 Years	6.2%
Last 20 Years	8.0%
Last 25 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.

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 2022 annual report, URS's current target asset allocation is:

Asset Category	Target Allocation
Equities (Domestic and International)	35%
Debt Securities	20%
Real Assets	18%
Private Equity	12%
Absolute Return	15%
Cash	0%
Total	100%

Because GRS is a benefit 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:

- Aon
- BNY Mellon
- Cambridge
- JP Morgan
- Mercer Consulting
- NEPC
- Verus
- Wilshire

Each of these investment consultants provided forward-looking return expectations for the next 7 to 10 years. Additionally, four of these firms (Aon, Cambridge, Mercer, and NEPC) develop return expectations over a longer, 20- to 30-year period.

URS theoretically has an indefinite life span which may result in some stakeholders believing that emphasis should be placed solely on long-term expectations, even if short-term expectations are materially different. While URS is expected to have an indefinite life span, this system is relatively mature with material shorter-term liability attributable to current retirees. We believe it is important for decision makers to also consider return expectations over the next seven to ten years.

Throughout the 2022 calendar year, the capital markets and economic assumptions have vastly changed. The S&P 500 return during the calendar year was a -18%. Actual inflation has been at a 40-year high and the year to year change continues to be over 6%. Also, the current yield on 10-year Treasuries have increased from 1.80% in January 2022 to 3.80% at the end of the 2022 calendar year. Because of these market changes, investment consultants have noticeably increased their forward-looking expectations in 2023. As a result, we believe it is prudent to view and compare the return expectations based on the 2022 and 2023 capital market assumptions for decision making purposes.

Analysis of Experience and Recommendations

The following table provides the expected return (i.e. 50th percentile) and the probability of exceeding the current 6.85% return assumption.

	Investment Consultant	50th Percentiale Expected Return (Geometric) 2022	2023	Probability of Exceeding 6.85% 2022	2023	Probability of Exceeding 6.75% 2022	2023
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
7 to 10 Year Expectations	1	4.9%	6.1%	30%	42%	31%	43%
	2	5.3%	6.4%	33%	46%	34%	47%
	3	5.7%	6.7%	37%	49%	38%	50%
	4	5.6%	6.9%	37%	51%	38%	52%
	5	6.0%	7.0%	41%	52%	42%	53%
	6	5.5%	7.1%	36%	52%	37%	53%
	7	5.5%	7.2%	34%	55%	35%	56%
	8	5.2%	7.3%	30%	56%	31%	58%
	9	6.1%	7.4%	41%	56%	42%	57%
20 to 30 Year Expectations	1	6.2%	6.9%	43%	51%	44%	52%
	2	6.2%	7.2%	43%	54%	44%	55%
	3	6.3%	7.2%	44%	54%	45%	56%
	4	6.6%	7.6%	47%	58%	48%	59%
7-10 Year Expectation Avg:		**5.5%**	**6.9%**	**35%**	**51%**	**36%**	**52%**
20-30 Year Expectation Avg:		**6.3%**	**7.2%**	**44%**	**54%**	**45%**	**56%**

Recommendation

Investment return expectations increased significantly compared to the prior year. Based on our broader survey, the average of the 50th percentile return expectations is 6.90% based on the 10-year assumptions and 7.30% based on the longer 30-year assumptions. The probability of exceeding the current investment return assumption of 6.85% is slightly greater than 50% for both 2023 assumption sets. However, we do not recommend the Board put undue weight in one particular investment consultant or one particular year's survey of return expectations. As a result, we recommend maintaining the current 6.85% return assumption. However, since investment risk is nonsymmetrical and there is greater risk of downside returns compared to upside returns, it would also be reasonable if the Board elected to decrease the investment return assumption. For that reason, the table above also provides the probability of exceeding a 6.75% return assumption.

Analysis of Experience and Recommendations

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 2.50% price inflation assumption, we recommend the use of a 2.50% COLA assumption for all of the funds. However, if the Board decided to increase the price inflation assumption to 2.75%, then the corresponding COLA assumption for the Tier 1 Public Employee and Tier 1 Public Safety funds with a 4.00% COLA would increase to 2.75%.

Analysis of Experience and Recommendations

Salary increase assumption for individuals

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 members in URS 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 with working with Systems across the country 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 10-year period in establishing our assumptions.

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%
2017	4.6%	6.7%	4.9%	5.7%	5.4%
2018	5.2%	7.8%	5.4%	6.1%	5.1%
2019	5.3%	7.5%	5.8%	7.1%	6.1%
2020	4.2%	7.7%	4.9%	5.2%	5.5%
2021	6.0%	8.6%	6.0%	7.7%	6.1%
2022	7.9%	7.0%	9.9%	16.4%	9.4%
Average 10-19	**3.7%**	**4.7%**	**4.0%**	**4.2%**	**4.1%**
Average 13-22	**4.9%**	**6.3%**	**5.4%**	**5.2%**	**5.5%**

Experience excluded in this analysis

New Experience included in analysis

Excluded in 2022 analysis

As the table shows, the average salary increases members received in 2020, 2021, and 2022 were significantly higher than the first three years of the prior observation period (e.g. 2010, 2011, and 2012). As a result, the 10-year average of the salary increase based on this observation is also materially higher than the 10-year average in the last experience study. More importantly, the table shows a steady increase in salary increases throughout the last 10 years, which indicates that the increases in salaries is more likely a long-term pattern rather than short-term experience.

Analysis of Experience and Recommendations

The salary assumption can be thought of as consisting of wage inflation (the 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. Note that a salary increase assumption is not applicable for members earning benefits in the Legislative and Governors Plan, since neither benefits nor contributions are salary-related.

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, or what employers think of as an "across-the-board salary increase".

Historically, wage inflation almost always exceeds price inflation. This is because wage inflation is in theory the result of (1) price inflation, and (2) productivity gains being passed through to wages. The current 3.25% assumption can be thought of as comprised of (1) a 2.50% inflation rate, plus (2) an additional 0.75% for productivity gains. For the last twenty years ending in 2021, for the economy as a whole, wage inflation has outpaced price inflation by about 0.80% 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. The difference between wage inflation and price inflation has been relatively similar when looking at this average over the last 15- and 10-year period, being 0.60% over both periods. However, the 0.40% average for the last five years is distorted in part due to historical high price inflation in the last couple years.

Analysis of Experience and Recommendations

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	3.88%	2.60%	1.28%
State	3.46%	2.60%	0.86%
Local Government	3.72%	2.60%	1.12%
Public Safety	3.50%*	2.60%	0.90%
Firefighters	2.89%	2.60%	0.29%

*Excludes 2022 experience. Average salary increase for members with 25+ years of service is 4.50%, if 2022 experience is included.

As you can see, average pay increases for long-service employees over the last 10 years was between 0.86% and 1.28% over inflation for all employee groups except firefighters. Historically, salary increases have remained consistently elevated for several years. This experience is not limited to members of URS, but we have also observed similar type increases for public employees in many other States across the country. Looking forward, the labor market continues to be tight and unemployment has continued to not increase despite the Federal Reserve's aggressive increases in the federal funds rate. As a result of this information, we recommend a 0.25% increase in the wage inflation assumption to 3.50% (2.50% price inflation plus 1.00% productivity increase) for state employees, local government employees, educators, and firefighters. We also recommend a 0.50% increase in the wage inflation assumption to 3.75% for public safety members.

The average total salary increase for continuing judges over the 10-year period was 1.80%. For Judges, who do not have assumed step increases, we propose to maintain the current 0.75% productivity increase, which will keep the annual salary increase assumption at 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)

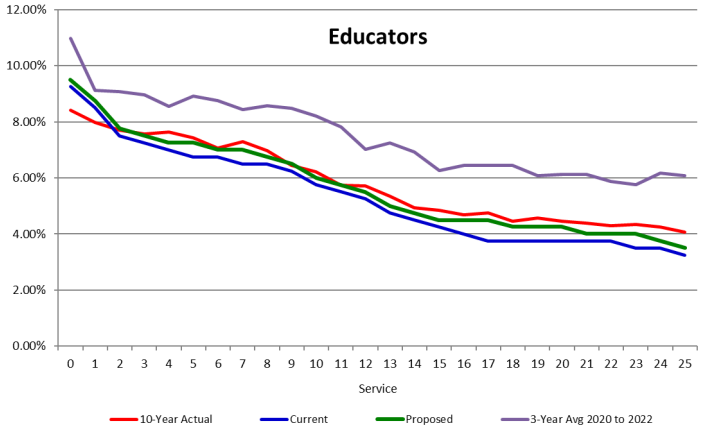
To analyze the service-related salary assumption, we looked at the excess in the average increases for shorter-service employees over the average for longer-service employees. For example, teachers with three years of service received an average increase of 7.57%, or a 3.69% increase above than the average increase of 3.88% for teachers with twenty-five or more years of service.

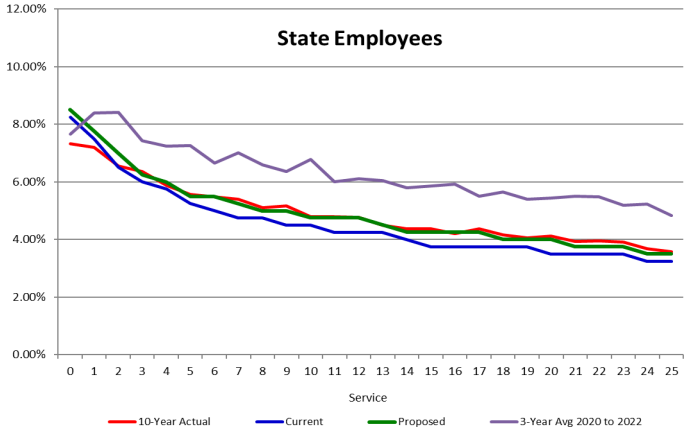
We then determined new service-related assumptions reflecting this data. For instance, in the example above, the step for a teacher entering her fourth year under the current assumption is 4.00% (versus the 3.69% actual).

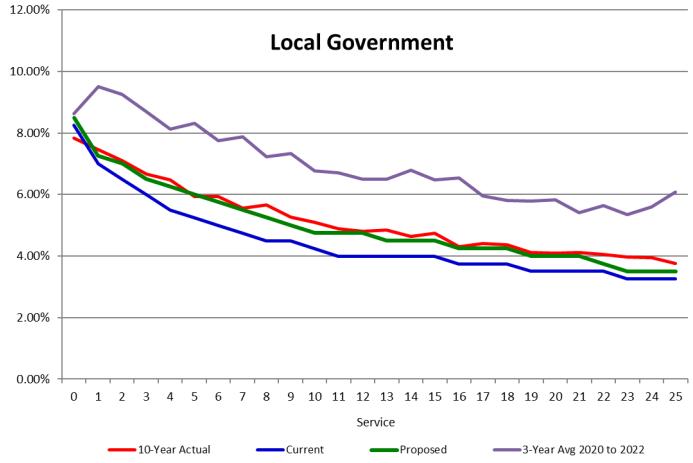
Analysis of Experience and Recommendations

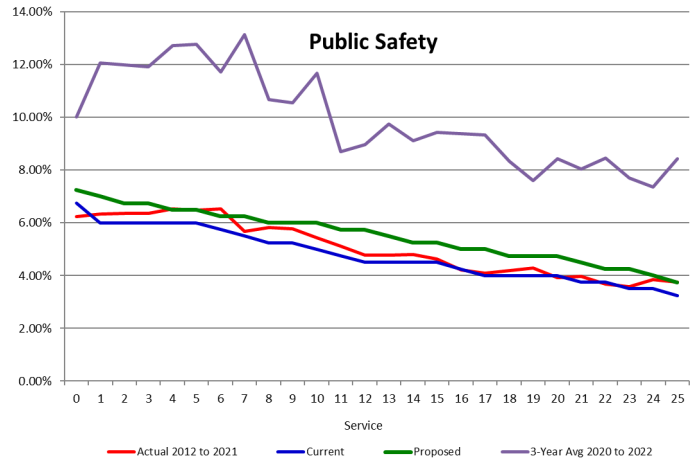
Salary increase assumptions (overall)

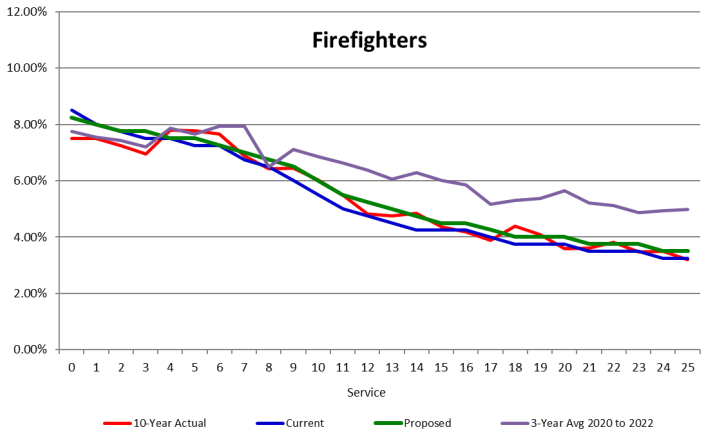
The overall effect of the changes to the wage inflation will result in a noticeable increase to the assumed rate of salary increases for each employee group. We believe the level of increase for these employee groups will more accurately model the salary increases that will be provided to these members for the foreseeable future. The following are charts illustrate the change in the salary increase assumption for each employee group as well as the average actual increase provided to these members for the last three years, which have been significantly higher than historical increases as well as the recommended assumption. More detail is shown on the tables in Section F. See pages 102-106.











Analysis of Experience and Recommendations

Payroll growth rate

The salary increase assumption discussed above is applied to individuals and is used in projecting future benefits. When calculating the employer contribution rates, the amortization payments that pay off the unfunded liability are calculated to be a level percentage of total payroll. Therefore, as payroll increases over time, the amortization payments do as well. Note, as the financial condition of the system continues to improve and become fully funded, the calculated amortization cost decreases and becomes an immaterial assumption in the actuarial valuation. Also, it is conservative to assume a payroll growth assumption that is lower than actual experience because it results in greater contributions than expected to finance 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 or retire, 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 active population. However, we do not currently assume membership growth in setting the payroll growth assumption.

The following table 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	5.9%	1.3%	4.6%
Last 10 Years	4.7%	0.7%	4.0%
Last 15 Years	3.7%	0.4%	3.3%
Last 20 Years	3.8%	0.7%	3.1%

The strength of the economy during the last eight years resulted in a noticeable increase in covered payroll and membership. However, given the relative insignificance of this assumption in the actuarial valuation because of the financial condition of the funds, we are recommending no change to the current 2.90% 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 assumptions based on gender and for educators and noneducators. We use different tables for educators because our studies (for URS and other statewide retirement systems) have consistently shown that they live longer on average than other state and local government employees. Also, we find that the mortality experience for public safety members and firefighters is not materially different than that of state and local government employees.

The current base mortality assumptions are based on a URS specific mortality table that was developed based on actual URS retiree mortality experience through December 31, 2019. A multiplier was then applied to the mortality table based on employee group.

Current Assumption: State and local government retirees as well as public safety and firefighter retirees

- Male: 2020 PR Utah Retiree Mortality Table for males multiplied by 110%
- Female: 2020 PR Utah Retiree Mortality Table for females multiplied by 110%

Current Assumption: Retired educators as well as retired judges

- Male: 2020 PR Utah Retiree Mortality Table for males multiplied by 90%
- Female: 2020 PR Utah Retiree Mortality Table for females multiplied by 90%

The base mortality table is projected with 80% of the ultimate rates from the MP-2019 mortality improvement scale using a base year of 2020.

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 to best model mortality experience by using a mortality table constructed based

on the system's own 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 is too large to be considered fully credible for the 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%
1.150	75%	13,233	1,470	529	132	33
1.282	80%	16,424	1,825	657	164	41
1.645	90%	27,055	3,006	1,082	271	68
1.960	95%	38,415	4,268	1,537	384	96
2.576	99%	66,349	7,372	2,654	663	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 4,210 male deaths and 4,600 female deaths during the five-year period ending December 31, 2022. 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. However, in this instance we intentionally used a nine-year period for this analysis to improve the credibility at the non-core ages of the retiree mortality assumption.

Recommended Base Mortality Assumption

We performed our analysis using a benefit-weighted approach, where we measure the exposures and actual deaths using the retiree's benefit amount, rather than a headcount approach that applies an equal weighting to all retirees. Developing a base table 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. As a reference, a benefit-weighted approach is regularly used by the Society of Actuaries (SOA) when they develop published mortality tables for pension plans.

A mortality table based on actual URS experience was constructed during the last experience study, which was immediately prior to the COVID-19 pandemic. We used nine years of experience in reviewing the experience, as we believe it will result in a more appropriate analysis since it will include three years of pre-COVID-19 experience. To provide a perspective of the impact of COVID-19 on the URS retiree mortality experience, below is a table with the raw mortality experience for each

membership group for the last five years with the first two years being prior to the pandemic. As the table shows, the crude mortality experience for the last three years is somewhat higher than the in the first two years of the table. However, we anticipate the mortality rates will decrease and become closer to the pre-2020 mortality rates in the upcoming years.

Crude Mortality Rate for Non-Disabled Retirees by Fiscal Year Ending December 31,

	Males			Females		
FY Ending	State	Educators	PS / FF	State	Educators	PS / FF
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2018	2.5%	2.8%	1.8%	2.1%	1.7%	0.7%
2019	2.7%	2.7%	1.5%	1.8%	1.9%	1.4%
2020	2.9%	3.9%	1.8%	2.2%	1.7%	1.0%
2021	3.4%	3.8%	2.2%	2.1%	1.8%	1.4%
2022	3.0%	3.8%	1.7%	2.4%	2.1%	1.5%

Note, comparing the crude rates for each membership group does not provide any type of meaningful comparison of differences in life expectancy since the retiree demographics are different for each employee group. For instance, a higher average age for a retiree group is generally expected to result in a slightly higher crude rate.

Not surprisingly, the actual mortality experience of URS retirees was higher than expected, with the most noticeable difference being for retirees over the age of 80, which were particularly negatively impacted by COVID-19. Below is a table comparing the actual and expected deaths for each employee group.

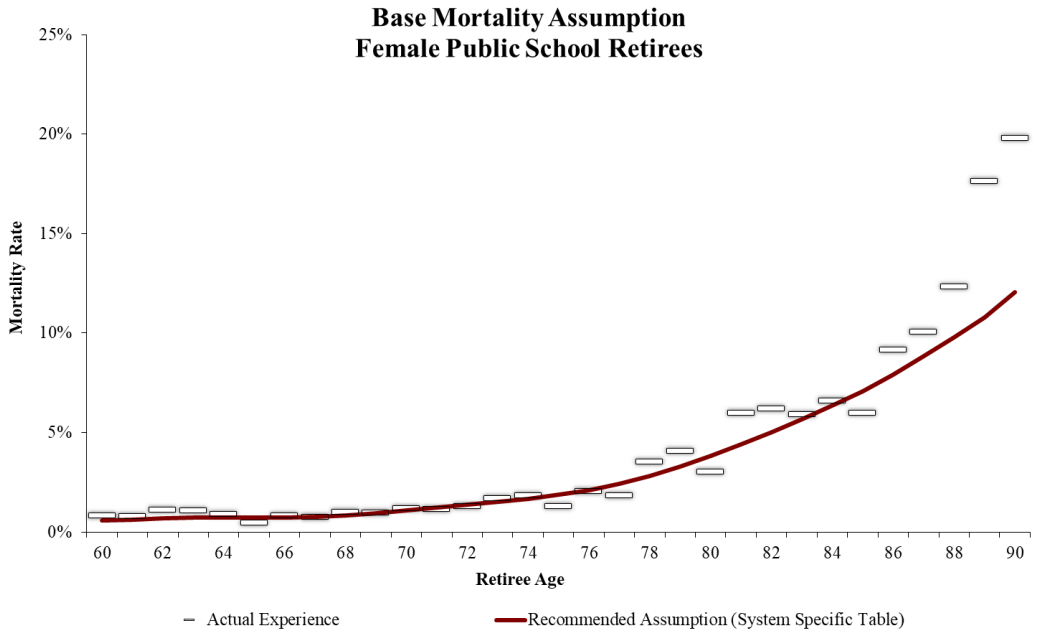
Non-Disabled Retiree Mortality Experience			
Group	Actual Deaths	Expected Deaths	Actual / Expected Ratio
State and Loc - males	85,186	79,820	107%
State and Loc - females	61,110	59,319	103%
Educators - males	52,456	46,254	113%
Educators – females	47,256	42,441	111%
Public Safety and Firefighters - males	28,570	27,744	103%
Public Safety and Firefighters - females	1,409	1,174	120%

Amounts in thousands.

We do not want to over adjust the mortality assumption and increase the mortality rates because we believe the recent experience is temporary due to the COVID-19 pandemic. As such, we believe it is most appropriate to leave the base mortality assumption unchanged.

Analysis of Experience and Recommendations

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



Recommended Mortality Improvement Assumption

Beginning with the 2011 actuarial valuation, the mortality assumption included an explicit assumption that mortality would improve in future years. The explicit assumption was Scale AA, and was the most common improvement assumption used at that time. Since then, the SOA has created additional mortality improvement assumptions for pension actuaries to consider for use which include: Scale BB (released by the SOA in 2012), and variations of the Scale MP (releases in 2014, 2015, 2016, 2017, 2018, 2019, and 2020).

In October 2014, the SOA issued a mortality study that was initiated in 2010 that included the release of the mortality improvement assumption MP-2014. Since then, the SOA has issued refinements to the MP-2014 improvement assumption each subsequent year (i.e. 2015, 2016, 2017, 2018, and 2019) and in each update, the rates of improvement were decreased, meaning each MP variation was found to have overstated the rate of improvement in life expectancy. Despite reductions in mortality improvement rates during the select period of the improvement scales, all versions of the MP improvement scales through 2019 reach the same ultimate improvement rate of approximately 1% per year.

The current mortality improvement assumption is 80% of the ultimate MP-2019 improvement assumption issued by the Society of Actuaries (e.g. generally 0.8%). However, in the Society of Actuaries 2020 report the ultimate mortality improvement rates were modified to be higher at some ages and adjusted to better reflect historical trends for different age groups. Specifically, the pattern

is a rate of 1.35% for ages 62 and younger, decreasing linearly to 1.10% at age 80, further decreasing linearly to 0.40% at age 95, and then decreasing linearly to 0.00% at age 115 (and thereafter).

In general, the net change in overall liabilities is minimal if a retirement system adopted the ultimate rates of the MP-2020 version because the overall pattern of the improvement over a retiree's lifetime is not much different. However, we give preference to the more recently published report as the 2020 report provides several pages of rationale and disclosure of the process used to generate the new long-term rates, including comparing to historical trends, and we find the analysis thorough and reasonable. Thus, we are recommending use of the ultimate rates in the MP-2020 scales, applied for all years, which we refer to as the "2020MP-Ultimate" improvement assumption.

Recommended Non-Disabled Mortality Assumption

Proposed Assumption: State and local government retirees as well as public safety and firefighter retirees (no change to the current assumption)

Males: 2020 PR UTAH for Males multiplied by 110%
Females: 2020 PR UTAH for Females multiplied by 110%

Proposed Assumption: Retired educators as well as retired judges (no change to the current assumption)
Males: 2020 PR UTAH for Males multiplied by 90%
Females: 2020 PR UTAH for Females multiplied by 90%

The base mortality table is projected using the ultimate rates in the MP-2020 improvement assumption using a base year of 2020.

The following table summarizes 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				
	2025	**2030**	**2035**	**2040**	**2045**
Male Educators (Current)	22.9	23.2	23.5	23.8	24.1
Male Educators (Recommended)	23.0	23.3	23.6	24.0	24.3
Female Educators (Current)	24.6	24.9	25.2	25.5	25.8
Female Educators (Recommended)	24.6	24.9	25.2	25.5	25.8
Male Noneducators (Current)	21.3	21.6	21.9	22.2	22.5
Male Noneducators (Recommended)	21.5	21.8	22.1	22.5	22.8
Female Noneducators (Current)	23.0	23.3	23.6	23.9	24.2
Female Noneducators (Recommended)	23.0	23.4	23.7	24.0	24.3

More detail is shown on the table on pages 48-53 in Section F.

Analysis of Experience and Recommendations

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 relatively small number of disabled retirees and deaths, we combined all the disabled lives for our analysis and also used nine years of experience. The analysis was also performed on a benefit-weighted basis. The valuation currently uses the PUB-2010 Mortality Table for disabled annuitants (separate tables for males and females with the base table adjusted with a 115% multiplier for disabled males and a 125% multiplier for disabled females), and the generational improvement assumption is the same as non-disabled retirees, 80% of the ultimate rate of improvement in projection Scale MP-2019, to project future improvements in mortality.

Based on the current experience (on a benefit weighted basis), the A/E ratio was 121% for males and 117% for females. However, because there were only 309 and 355 male and female deaths, respectively, during the observation period, the experience is just under 50% statistically credible. Based on this analysis, we recommend continued use of the PUB-2010 base mortality assumption and to increase the multiplier for males from 115% to 120%. We also recommend updating the mortality improvement assumption to be the same as that used for non-disabled retirees, which is the ultimate rates in the MP-2020 improvement tables using a base year of 2010.

More detail is shown on the table on pages 54-55 in Section F.

Active mortality

This is the least significant of all the mortality assumptions. As such we used five years of experience. Also, the small number of deaths occurring to active members lacks statistical credibility, which means we must rely on a published mortality table. We recommended an update to the public employee mortality tables developed by the SOA when we performed the last experience study in 2019, which uses the general employee table for state and local government employees (as well as judges, governors, and legislators), the teacher mortality table for educators, and the public safety mortality table for public safety members and firefighters.

We recommend no change to this assumption for this experience study. More detail is shown on the tables on pages 56-65 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 enter into the Long-Term Disability Program (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. Because of the small number of female public

safety members and firefighters, we combined the male and female experience to increase the statistical credibility of the analysis for these membership groups.

We compared the number of actual and expected disabilities by group for the last six years (i.e. 2017 through 2022). The overall A/E ratio based on the current assumptions was 57% (392 new disabilities during the study period vs. 690 expected), which is a decrease in the number of disabilities since each of the last two experience studies. The current disability assumption is based on the same age-based rates but a different multiplier is applied to these rates by gender and employee type. The shape of the current disability rates continues to provide an adequate fit, and only a change in the multiplier applied to the rates is necessary. We reduced the multiplier for all employee groups (except for public safety members) to decrease the number of expected disabilities. We recommend no change to the assumption applicable to public safety members. Under the new recommended assumptions, the overall A/E ratio is now 79% (498 expected disabilities). The following table provides the proposed multiplier by employee group.

Group	Current Multiplier	Proposed Multiplier
State & Local - males	65%	50%
State - females	65%	50%
Local - females	65%	40%
Educators - males	45%	30%
Educators - females	50%	30%
Public Safety	75%	75%
Firefighters	235%	180%

No disability rates are used for the Judges System or the Governors and Legislative Plan. More detail is shown on the tables on pages 66-73 in Section F.

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 purposes of performing this analysis, we reviewed the actual and expected retirements on a salary weighted basis for the last six years (i.e. 2017 through 2022). This is preferable to reviewing the experience on a headcount basis because a salary weighted basis provides greater weight to those members with a larger salary (and liability). Also, retirements from the Tier 2 Hybrid System (public employee and public safety and firefighters) account for less than 5% of the total retirements in URS.

Analysis of Experience and Recommendations

Due to this lack of statistical credibility to review their experience, the analysis below only reflects retirements from the Tier I funds.

The following table shows the actual retirements (on a salary weighted basis) as well as the expected retirements under the current and recommended assumptions (reduced retirement and unreduced retirement combined) for the various membership groups:

Tier 1 Retirement Experience			
Group	Actual Retirements	Expected Current Assumption	Expected Proposed Assumption
Educators - males	75,927	83,489	89,320
Educators - females	199,534	217,836	228,868
State - males	140,866	167,863	167,863
State – females	196,435	226,163	226,163
Local - males	103,935	115,445	123,366
Local - females	71,770	83,947	87,479
Public Safety	107,291	107,704	115,890
Firefighters	22,592	25,864	24,703
Judges	5,562	7,763	7,763

Amounts in thousands.

As the table shows, the expected retirements were generally greater than the actual retirements on a salary weighted basis. It is generally conservative in the valuation for the expected retirements to exceed the actual retirements. We made minor adjustments to the retirement rates at certain ages for the membership groups that resulted in a slight increase in the expected retirements for educators (males and females), local government members (males and females), and public safety. The adjustment to the retirement rates for firefighters results in a slight decrease in expected retirements.

There is no statistically credible retirement experience for either one of the Tier II Hybrid Retirement Systems, and those members who have retired entered these systems late in their career making their retirement behavior unreliable for establishing retirement patterns for all members earning Tier II retirement benefits. For instance, less than 5% of total retirements in URS are Tier II members. Retirement benefits provided in the Tier II Systems are slightly lower than benefits provided in the Tier I Systems. Additionally, members must work longer to be eligible to commence their retirement benefit. In our professional judgement, relatively few Tier II members will retire with a reduced early retirement benefit. However, without credible experience to base retirement rates upon, we believe the retirement pattern of members earning benefits in the Tier I Systems (Public Employee and Public Safety and Firefighters) is a reasonable basis for the members earning benefits in the Tier II Systems.

As a result, we recommend making no changes to the Tier II public employee rates of retirement for members eligible for normal retirement. However, since the benefit multiplier for the Tier II public safety and firefighter system is the same as the Tier I public safety and firefighter funds, we recommend setting the retirement rates for Tier II public safety members and firefighters equal to the comparable Tier I retirement rates.

Section F provides more detail about the actual and expected number of retirements. See pages 82-101. Appendix A provides the full Tier II proposed retirement rate tables.

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.

Similar to our analysis of the retirement behavior, we reviewed the actual and expected terminations on a salary weighted basis. This is preferable to reviewing the experience on a headcount basis because a salary weighted basis provides greater weight to those members with a larger salary (and liability). Below is a summary of the results for the systems. Similar to the retirement table above, the table shows the actual terminations and expected terminations under the current and proposed assumptions on a salary weighted basis. We also used nine years of experience in performing this analysis to better reflect the turnover experience over an entire economic cycle (i.e. don't overreact to short-term turnover behaviors in setting long-term forward-looking turnover expectations).

Analysis of Experience and Recommendations

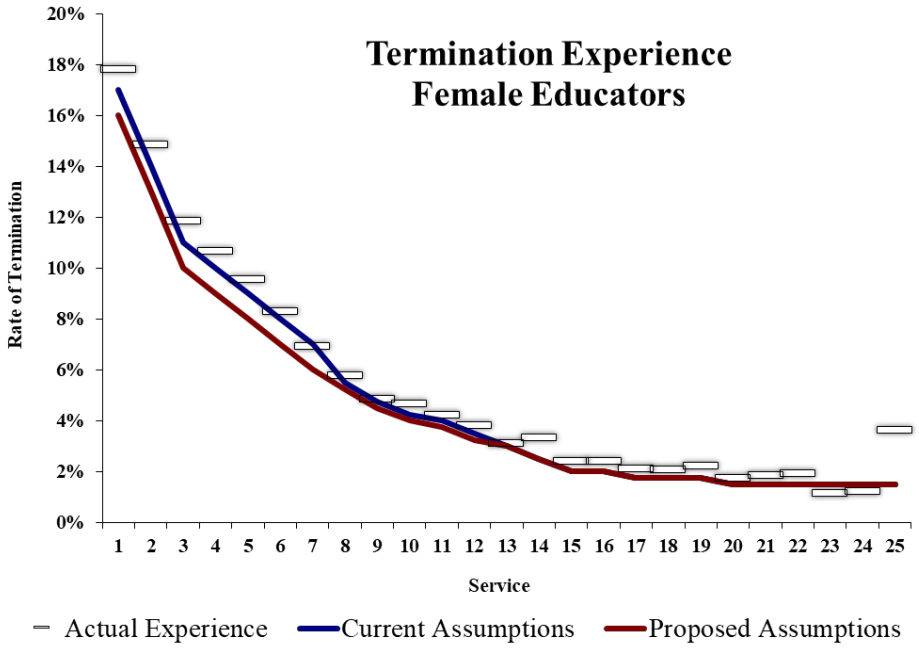
Group	Actual Terminations	Expected Current Assumption	Expected Proposed Assumption
Educators - males	186,336	165,307	161,985
Educators - females	571,783	534,785	494,611
State - males	341,664	305,701	305,701
State - females	488,445	440,210	440,210
Local - males	316,117	265,642	272,658
Local - females	305,541	259,775	267,618
Public Safety	128,629	106,692	111,186
Firefighters	21,886	15,653	18,303

Amounts in thousands.

The analysis shows that the actual turnover was higher than currently assumed for all the membership groups. It is preferable to have an assumption where there is more turnover than expected, as this will reduce the likelihood of liability losses due to this membership behavior. Although the actual turnover was higher than expected, we believe additional margin is warranted (i.e. termination rates were decreased) for educators (males and females). On the other hand, we slightly increased the termination rates for local government members and public safety members to avoid being overly conservative in the assumption.

Analysis of Experience and Recommendations

The following is a chart showing the actual experience, current assumption, and recommended assumption for female educators, which is one of the largest membership groups in URS.



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 the 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 74-81 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. (This assumption only affects some of the death and survivor benefits, particularly in the Public Safety and Firefighters Systems.)

Spousal age difference

This assumption applies only prior to retirement. When a member retires, the actual spousal information is provided and used. 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 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 a change.

Refund of contributions

The valuation currently assumes that a percentage of terminating members who participate in one of the Tier 1 contributory plans will take a refund, rather than leaving their funds on deposit with URS. The percentage grades down from 100% for all non-vested members to 0% after 20 years of service. As of January 1, 2022, there were only 253 and 1,289 active members in the Tier I public employee and firefighter systems, respectively. Since most these Tier I members have a significant amount of service, this is not a material assumption and we are not recommending changes to this assumption with respect to the Tier 1 funds.

Beginning July 1, 2020, the Tier 2 Public Safety and Firefighter fund became contributory and requires employees to contribute 2.27% of pay. Given the employee contributions are small compared to the value of the pension benefit, it is appropriate to make a different refund assumption for these members. Therefore, we recommend the valuation include a refund assumption where members receive a refund when the value of their employee contribution balance exceeds the value of their pension benefit. From a practical perspective, these members would only receive a refund if they become an inactive member before they become vested in their pension benefit.

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.

Analysis of Experience and Recommendations

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 6.85% 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 6.85% is reflected immediately in the AVA, and the other 5.15% 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. Therefore, we are recommending no change to this method.

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 provide 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 reaches 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 and the Higher Education funds) 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.

Analysis of Experience and Recommendations

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.

The Governors and Legislators Pension Plan is relatively small and funded by periodic direct appropriations rather than through pay-period contributions. Therefore, we recommend continuing to use a closed amortization period. Similarly, employers in the Higher Education funds new are not enrolling their new employees in URS resulting in these funds are being financed by a declining payroll. Therefore, we recommend the continued use of a closed amortization for these two funds as well.

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, 2023 actuarially calculated employer contribution rates and unfunded actuarially accrued liability.

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

Utah Retirement Systems

Comparison of FY 2023/2024 Contribution Rates
Based on the 2023 Actuarial Valuation

Fund/Division	FY 23/24 Board Certified Contribution Rates	2023 Current Assumptions 6.85% Interest	2023 Proposed Assumptions 6.85% Interest	Change in Calculated Rate (4) - (3)
(1)	(2)	(3)	(4)	(5)
I. Public Employees Contributory				
A. Local Government	**13.96%**	8.91%	10.19%	1.28%
B. State and School	**17.70%**	12.22%	13.51%	1.29%
C. Higher Education	**17.70%**	8.47%	9.94%	1.47%
II. Public Employees Noncontributory				
A. Local Government	**17.97%**	12.92%	14.20%	1.28%
B. State and School	**22.19%**	16.71%	18.00%	1.29%
C. Higher Education	**22.19%**	12.96%	14.43%	1.47%
III. Public Safety Contributory				
A. Other Division A (2.5% COLA)	**22.79%**	16.54%	19.87%	3.33%
IV. Public Safety Noncontributory				
A. State	**41.35%**	29.82%	33.28%	3.46%
B. Other Division A (2.5% COLA)	**34.04%**	27.94%	31.34%	3.40%
C. Other Division A (4% COLA)	**35.71%**	28.35%	31.87%	3.52%
D. Salt Lake City	**46.71%**	34.53%	38.05%	3.52%
E. Ogden	**48.72%**	34.64%	38.00%	3.36%
F. Provo	**42.23%**	34.53%	37.91%	3.38%
G. Logan	**41.97%**	32.06%	35.60%	3.54%
H. Bountiful	**50.38%**	35.19%	38.53%	3.34%
I. Other Division B (2.5% COLA)	**32.28%**	29.24%	32.57%	3.33%
J. Other Division B (4% COLA)	**37.97%**	18.47%	22.16%	3.69%
V. Firefighters				
A. Division A	**14.67%**	8.07%	8.68%	0.61%
B. Division B	**17.40%**	-2.22%	-1.70%	0.52%
VI. Judges	**51.91%**	45.16%	45.10%	-0.06%
VII. Tier II - Hybrid Plans				
A. Public Employees	**9.82%**	9.77%	10.70%	0.93%
B. Public Safety and Firefighter	**16.59%**	16.39%	18.73%	2.34%

Note: Rates shown include contribution for 3% Substantial Substitute, if applicable.
Rates shown for Firefighters and Judges exclude offsets for fire insurance premium tax and court fees.
Rates for Tier II Hybrid Plans exclude the cost of the 75% of pay active death benefit and include required member contributions.

Actuarial Impact of Recommendations

Utah Retirement Systems

Comparison of Unfunded Actuarial Actuarial Accrued Liability (UAAL)
Based on the 2023 Actuarial Valuation
($ in millions)

Fund/Division	2023 Current Assumptions 6.85% Interest	2023 Proposed Assumptions 6.85% Interest	Change in UAAL (3) - (2)
(1)	(2)	(3)	(4)
I. Public Employees Contributory			
A. Local Government	$ 9	$ 11	$ 2
B. State and School	8	9	1
C. Higher Education	1	1	0
II. Public Employees Noncontributory			
A. Local Government	271	366	95
B. State and School	1,918	2,155	237
C. Higher Education	1	19	17
III. Public Safety Contributory			
A. Other Division A (2.5% COLA)	2	3	0
IV. Public Safety Noncontributory			
A. State	133	149	16
B. Other Division A (2.5% COLA)	113	129	17
C. Other Division A (4% COLA)	34	39	5
D. Salt Lake City	64	68	4
E. Ogden	15	16	1
F. Provo	12	12	1
G. Logan	4	4	0
H. Bountiful	5	5	0
I. Other Division B (2.5% COLA)	76	83	7
J. Other Division B (4% COLA)	(4)	(3)	1
V. Firefighters			
A. Division A	(18)	(17)	1
B. Division B	(136)	(136)	(0)
VI. Judges	40	40	(0)
VII. Governors and Legislative	1	1	0
VIII. 3% Substantial Substitute	266	267	0
IX. Tier II - Hybrid Plans			
A. Public Employees	94	161	67
B. Public Safety and Firefighter	16	33	17
X. Grand Total	$ 2,926	$ 3,415	$ 489

SECTION E

SUMMARY OF RECOMMENDATIONS

Summary of Recommendations

1. No change to the 2.50% price inflation assumption.

2. No change to the 6.85% investment return assumption.

3. Increase the wage inflation assumption by 0.25% to 3.50% of the salary assumption and make some upward adjustments to the step-rate component of the salary increases for state employees, local government employees, educators, and firefighters. Increase the wage inflation assumption by 0.50% to 3.75% for public safety members.

4. No change to the 2.90% payroll growth rate assumption.

5. Maintain use of the custom developed mortality table in 2020. Continued use of separate adjustments to the mortality assumption for educators and non-educators. Update the improvement assumption to the ultimate rates in the MP-2020 improvement assumption issued by the SoA.

6. Recommend continued use of the PUB-2010 disabled retiree mortality assumption and increase the multiplier for males from 115% to 120%. No change to the 125% multiplier for female assumption.

7. Recommend continued use of the Pub-2010 employee mortality assumption.

8. Recommend overall decreases to the rates of disability incidence for all employee groups except public safety members, which will remain unchanged.

9. Small increases in the rates of retirement for educators and local government members (males and females), and public safety members. Slight reduction in the rates of retirement for firefighters. No change to the retirement assumption for state employees.

10. Slight reduction in the rates of termination for educators and increases in the rates of termination for local government, public safety members, and firefighters at certain ages. No change to the termination assumption for state employees.

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

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

13. Use a 20-year open amortization for determining the actuarially determined contribution for all the funds expect the Governors and Legislators Pension Plan and the higher education funds. The amortization period for the Governors and Legislators Pension Plan and the higher education funds will continue to remain closed.

SECTION F

SUMMARY OF DATA AND EXPERIENCE

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 GENERAL STATE & LOCAL GOVERNMENT
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.08%	0.08%	$ -	$ -	0%	0%
45-49	0	2,378	0.0000	0.17%	0.17%	5	5	0%	0%
50-54	59	30,732	0.0019	0.35%	0.35%	114	114	52%	52%
55-59	1,038	136,411	0.0076	0.51%	0.51%	744	744	139%	139%
60-64	3,401	379,681	0.0090	0.84%	0.84%	3,168	3,168	107%	107%
65-69	7,995	724,166	0.0110	0.95%	0.95%	7,209	7,209	111%	111%
70-74	11,866	689,015	0.0172	1.67%	1.67%	11,429	11,429	104%	104%
75-79	14,173	458,125	0.0309	2.97%	2.97%	13,688	13,688	104%	104%
80-84	16,365	264,641	0.0618	6.14%	6.14%	15,845	15,845	103%	103%
85-89	14,907	132,852	0.1122	10.80%	10.80%	13,965	13,965	107%	107%
90-94	9,482	49,108	0.1931	19.68%	19.68%	9,177	9,177	103%	103%
95-99	2,888	6,946	0.4158	32.26%	32.26%	2,189	2,189	132%	132%
Other	3,011	7,216	0.4173			2,285	2,285	132%	132%
Totals	$ 85,186	$ 2,881,272				$ 79,820	$ 79,820	107%	107%

*$ in thousands
*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
FEMALE GENERAL STATE & LOCAL GOVERNMENT
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.04%	0.04%	$ -	$ -	0%	0%
45-49	27	1,726	0.0157	0.11%	0.11%	3	3	1047%	1047%
50-54	98	23,772	0.0041	0.13%	0.26%	69	69	143%	143%
55-59	780	113,703	0.0069	0.20%	0.57%	637	637	122%	122%
60-64	2,576	380,736	0.0068	0.38%	0.70%	2,640	2,640	98%	98%
65-69	6,325	791,507	0.0080	0.72%	0.86%	6,631	6,631	95%	95%
70-74	8,819	691,596	0.0128	1.37%	1.18%	8,084	8,084	109%	109%
75-79	10,687	421,490	0.0254	2.59%	2.40%	9,676	9,676	110%	110%
80-84	10,908	235,725	0.0463	4.92%	4.78%	10,702	10,702	102%	102%
85-89	10,435	117,318	0.0889	9.43%	9.45%	10,526	10,526	99%	99%
90-94	7,964	44,686	0.1782	17.98%	19.33%	7,901	7,901	101%	101%
95-99	2,150	8,870	0.2423	32.20%	25.31%	2,141	2,141	100%	100%
Other	341	978	0.3484			308	308	111%	111%
Totals	$ 61,110	$ 2,832,107				$ 59,319	$ 59,319	103%	103%

*$ in thousands
*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
MALE EDUCATORS
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.06%	0.06%	$ -	$ -	0%	0%
45-49	0	0	N/A	0.14%	0.14%	0	0	0%	0%
50-54	39	5,190	0.0076	0.29%	0.29%	16	16	245%	245%
55-59	191	46,418	0.0041	0.42%	0.42%	210	210	91%	91%
60-64	1,601	167,789	0.0095	0.69%	0.69%	1,152	1,152	139%	139%
65-69	2,841	346,981	0.0082	0.78%	0.78%	2,834	2,834	100%	100%
70-74	5,479	385,016	0.0142	1.37%	1.37%	5,262	5,262	104%	104%
75-79	7,604	307,301	0.0247	2.43%	2.43%	7,595	7,595	100%	100%
80-84	11,422	210,685	0.0542	5.03%	5.03%	10,437	10,437	109%	109%
85-89	12,421	121,022	0.1026	8.84%	8.84%	10,413	10,413	119%	119%
90-94	7,793	37,414	0.2083	16.10%	16.10%	5,662	5,662	138%	138%
95-99	1,498	5,076	0.2951	26.40%	26.40%	1,311	1,311	114%	114%
Other	1,567	5,245	0.2988			1,362	1,362	115%	115%
Totals	$ 52,456	$ 1,638,136				$ 46,254	$ 46,254	113%	113%

*$ in thousands
*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
FEMALE EDUCATORS
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.04%	0.04%	$ -	$ -	0%	0%
45-49	0	455	0.0000	0.09%	0.09%	1	1	0%	0%
50-54	106	16,925	0.0062	0.21%	0.21%	42	42	254%	254%
55-59	804	111,195	0.0072	0.45%	0.45%	518	518	155%	155%
60-64	2,170	360,620	0.0060	0.55%	0.55%	2,042	2,042	106%	106%
65-69	5,193	675,586	0.0077	0.68%	0.68%	4,631	4,631	112%	112%
70-74	5,049	605,216	0.0083	0.94%	0.94%	5,771	5,771	87%	87%
75-79	7,580	358,159	0.0212	1.90%	1.90%	6,719	6,719	113%	113%
80-84	7,950	199,567	0.0398	3.79%	3.79%	7,416	7,416	107%	107%
85-89	7,872	96,535	0.0815	7.49%	7.49%	7,132	7,132	110%	110%
90-94	6,114	34,860	0.1754	15.37%	15.37%	5,026	5,026	122%	122%
95-99	2,040	7,483	0.2726	20.21%	20.21%	1,478	1,478	138%	138%
Other	2,377	8,220	0.2892			1,666	1,666	143%	143%
Totals	$ 47,256	$ 2,474,819				$ 42,441	$ 42,441	111%	111%

*$ in thousands
*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
MALE PUBLIC SAFETY & FIREFIGHTERS
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ 13,458	0.0000	0.08%	0.08%	$ 12	$ 12	0%	0%
45-49	187	90,358	0.0021	0.17%	0.17%	168	168	112%	112%
50-54	444	157,322	0.0028	0.35%	0.35%	557	557	80%	80%
55-59	819	199,674	0.0041	0.51%	0.51%	1,056	1,056	78%	78%
60-64	1,647	281,657	0.0058	0.84%	0.84%	2,321	2,321	71%	71%
65-69	3,155	341,345	0.0092	0.95%	0.95%	3,370	3,370	94%	94%
70-74	4,436	276,741	0.0160	1.67%	1.67%	4,557	4,557	97%	97%
75-79	5,378	159,721	0.0337	2.97%	2.97%	4,730	4,730	114%	114%
80-84	5,468	80,778	0.0677	6.14%	6.14%	4,804	4,804	114%	114%
85-89	4,007	34,424	0.1164	10.80%	10.80%	3,579	3,579	112%	112%
90-94	2,202	10,511	0.2095	19.68%	19.68%	1,930	1,930	114%	114%
95-99	400	1,000	0.3997	32.26%	32.26%	316	316	127%	127%
Other	427	1,182	0.3607			345	345	124%	124%
Totals	$ 28,570	$ 1,648,171				$ 27,744	$ 27,744	103%	103%

*$ in thousands

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
FEMALE PUBLIC SAFETY & FIREFIGHTERS
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ 1,712	0.0000	0.04%	0.04%	$ 1	$ 1	0%	0%
45-49	0	9,966	0.0000	0.11%	0.11%	12	12	0%	0%
50-54	106	17,988	0.0059	0.25%	0.25%	49	49	218%	218%
55-59	0	23,406	0.0000	0.55%	0.55%	126	126	0%	0%
60-64	247	28,613	0.0086	0.67%	0.67%	197	197	126%	126%
65-69	236	25,942	0.0091	0.83%	0.83%	215	215	110%	110%
70-74	138	14,927	0.0093	1.15%	1.15%	171	171	81%	81%
75-79	221	6,205	0.0356	2.32%	2.32%	140	140	158%	158%
80-84	251	2,971	0.0845	4.63%	4.63%	134	134	187%	187%
85-89	177	1,193	0.1483	9.16%	9.16%	101	101	176%	176%
90-94	33	177	0.1865	18.78%	18.78%	28	28	117%	117%
95-99	0	0	N/A	24.70%	24.70%	0	0	0%	0%
Other	0	61	0.0000			0	0	0%	0%
Totals	$ 1,409	$ 133,161				$ 1,174	$ 1,174	120%	120%

*$ in thousands
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*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
ALL DISABLED MALES
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ 31	$ 2,007	0.0154	0.83%	0.83%	$ 18	$ 18	175%	174%
45-49	0	3,962	0.0000	1.33%	1.33%	54	54	0%	0%
50-54	90	5,572	0.0161	1.98%	1.98%	111	111	81%	80%
55-59	34	7,370	0.0046	2.48%	2.49%	184	184	18%	18%
60-64	394	14,101	0.0279	2.91%	2.92%	417	419	94%	94%
65-69	1,108	22,290	0.0497	3.65%	3.68%	816	823	136%	135%
70-74	1,197	19,430	0.0616	4.72%	4.79%	918	930	130%	129%
75-79	1,074	12,800	0.0839	6.44%	6.56%	814	829	132%	130%
80-84	879	6,413	0.1370	9.31%	9.57%	586	603	150%	146%
85-89	491	3,197	0.1536	13.73%	14.33%	431	449	114%	109%
90-94	236	1,042	0.2260	20.91%	22.10%	208	220	113%	107%
95-99	31	90	0.3420	29.65%	31.50%	25	27	120%	113%
Other	0	0	N/A			0	0	0%	0%
Totals	$ 5,562	$ 98,276				$ 4,581	$ 4,667	121%	119%

*$ in thousands
*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

POST-RETIREMENT MORTALITY EXPERIENCE
ALL DISABLED FEMALES
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ 376	0.0000	0.89%	0.86%	$ 4	$ 3	0%	0%
45-49	14	664	0.0203	1.38%	1.33%	9	9	149%	155%
50-54	0	839	0.0000	1.88%	1.80%	16	15	0%	0%
55-59	157	4,704	0.0335	2.17%	2.08%	103	99	153%	159%
60-64	393	13,175	0.0298	2.42%	2.33%	324	312	121%	126%
65-69	712	30,251	0.0235	2.90%	2.80%	885	855	80%	83%
70-74	1,264	27,882	0.0453	3.83%	3.72%	1,068	1,037	118%	122%
75-79	1,365	17,826	0.0766	5.53%	5.40%	973	950	140%	144%
80-84	723	8,526	0.0848	8.45%	8.32%	702	692	103%	105%
85-89	587	2,998	0.1958	13.04%	13.04%	376	376	156%	156%
90-94	165	735	0.2250	18.58%	18.82%	135	136	123%	121%
95-99	42	208	0.1993	26.87%	27.36%	55	56	76%	74%
Other	0	0	N/A			0	0	0%	0%
Totals	$ 5,422	$ 108,186				$ 4,649	$ 4,540	117%	119%

*$ in thousands
*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	0	937	0.0000	0.03%	0.03%	0.3	0.3	0%	0%
25-29	0	2,886	0.0000	0.03%	0.03%	0.9	0.9	0%	0%
30-34	2	4,672	0.0004	0.04%	0.04%	1.9	1.9	106%	106%
35-39	8	6,856	0.0012	0.05%	0.05%	3.7	3.7	215%	215%
40-44	4	8,468	0.0005	0.08%	0.08%	6.6	6.6	61%	61%
45-49	11	8,080	0.0014	0.12%	0.12%	9.5	9.5	116%	116%
50-54	11	8,091	0.0014	0.18%	0.18%	14.2	14.2	78%	78%
55-59	28	8,288	0.0034	0.26%	0.26%	21.3	21.3	132%	132%
60-64	22	7,464	0.0029	0.37%	0.37%	27.6	27.6	80%	80%
65-69	19	3,415	0.0056	0.55%	0.55%	18.0	18.0	105%	105%
70-74	6	1,077	0.0056	0.84%	0.84%	8.8	8.8	68%	68%
Totals	111	60,234				113	113	99%	99%

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*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	0	1,333	0.0000	0.01%	0.01%	0.1	0.1	0%	0%
25-29	0	4,441	0.0000	0.01%	0.01%	0.5	0.5	0%	0%
30-34	2	5,950	0.0003	0.02%	0.02%	1.1	1.1	188%	188%
35-39	5	7,983	0.0006	0.03%	0.03%	2.3	2.3	222%	222%
40-44	9	11,003	0.0008	0.04%	0.04%	4.8	4.8	187%	187%
45-49	8	13,209	0.0006	0.07%	0.07%	8.8	8.8	91%	91%
50-54	25	14,467	0.0017	0.10%	0.10%	14.1	14.1	177%	177%
55-59	25	16,555	0.0015	0.14%	0.14%	24.2	24.2	103%	103%
60-64	32	15,912	0.0020	0.22%	0.22%	35.2	35.2	91%	91%
65-69	15	6,588	0.0023	0.36%	0.36%	22.6	22.6	66%	66%
70-74	9	1,365	0.0066	0.60%	0.60%	7.7	7.7	117%	117%
Totals	130	98,806				121	121	107%	107%

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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	2	2,086	0.0010	0.03%	0.03%	0.7	0.7	297%	297%
25-29	0	3,963	0.0000	0.03%	0.03%	1.2	1.2	0%	0%
30-34	5	5,592	0.0009	0.04%	0.04%	2.2	2.2	222%	222%
35-39	7	7,192	0.0010	0.05%	0.05%	3.9	3.9	181%	181%
40-44	9	8,310	0.0011	0.08%	0.08%	6.4	6.4	140%	140%
45-49	16	7,554	0.0021	0.12%	0.12%	8.8	8.8	181%	181%
50-54	19	6,656	0.0029	0.18%	0.18%	11.6	11.6	163%	163%
55-59	13	6,582	0.0020	0.26%	0.26%	16.9	16.9	77%	77%
60-64	18	6,031	0.0030	0.37%	0.37%	22.3	22.3	81%	81%
65-69	11	2,568	0.0043	0.55%	0.55%	13.4	13.4	82%	82%
70-74	3	517	0.0058	0.84%	0.84%	4.2	4.2	72%	72%
Totals	103	57,051				92	92	112%	112%

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*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	1,349	0.0000	0.01%	0.01%	0.1	0.1	0%	0%
25-29	0	3,342	0.0000	0.01%	0.01%	0.4	0.4	0%	0%
30-34	0	4,184	0.0000	0.02%	0.02%	0.7	0.7	0%	0%
35-39	2	4,974	0.0004	0.03%	0.03%	1.4	1.4	143%	143%
40-44	8	6,028	0.0013	0.04%	0.04%	2.6	2.6	305%	305%
45-49	5	6,249	0.0008	0.07%	0.07%	4.1	4.1	121%	121%
50-54	8	5,864	0.0014	0.10%	0.10%	5.7	5.7	140%	140%
55-59	7	5,907	0.0012	0.14%	0.14%	8.6	8.6	81%	81%
60-64	9	5,495	0.0016	0.22%	0.22%	12.2	12.2	74%	74%
65-69	9	2,261	0.0040	0.36%	0.36%	7.7	7.7	116%	116%
70-74	2	451	0.0044	0.60%	0.60%	2.6	2.6	78%	78%
Totals	50	46,104				46	46	108%	108%

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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	841	0.0000	0.03%	0.03%	0.2	0.2	0%	0%
25-29	1	3,273	0.0003	0.02%	0.02%	0.6	0.6	164%	164%
30-34	1	5,000	0.0002	0.03%	0.03%	1.3	1.3	79%	79%
35-39	1	6,026	0.0002	0.03%	0.03%	2.1	2.1	48%	48%
40-44	4	6,660	0.0006	0.05%	0.05%	3.4	3.4	119%	119%
45-49	3	5,975	0.0005	0.08%	0.08%	4.9	4.9	61%	61%
50-54	6	5,372	0.0011	0.13%	0.13%	7.2	7.2	84%	84%
55-59	14	4,451	0.0031	0.20%	0.20%	9.1	9.1	154%	154%
60-64	9	3,256	0.0028	0.32%	0.32%	10.3	10.3	87%	87%
65-69	2	1,235	0.0016	0.53%	0.53%	6.3	6.3	32%	32%
70-74	4	369	0.0108	0.84%	0.84%	3.0	3.0	133%	133%
Totals	45	42,458				48	48	93%	93%

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*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	2,914	0.0000	0.01%	0.01%	0.3	0.3	0%	0%
25-29	2	13,184	0.0002	0.01%	0.01%	1.4	1.4	145%	145%
30-34	0	12,178	0.0000	0.02%	0.02%	2.0	2.0	0%	0%
35-39	1	14,363	0.0001	0.02%	0.02%	3.5	3.5	28%	28%
40-44	13	17,958	0.0007	0.04%	0.04%	6.7	6.7	193%	193%
45-49	5	19,056	0.0003	0.06%	0.06%	11.0	11.0	45%	45%
50-54	16	15,971	0.0010	0.09%	0.09%	13.6	13.6	118%	118%
55-59	15	13,221	0.0011	0.12%	0.12%	16.6	16.6	91%	91%
60-64	13	9,636	0.0013	0.20%	0.20%	18.6	18.6	70%	70%
65-69	10	3,323	0.0030	0.34%	0.34%	10.5	10.5	95%	95%
70-74	3	540	0.0056	0.63%	0.63%	3.2	3.2	95%	95%
Totals	78	122,344				87	87	89%	89%

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*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
PUBLIC SAFETY - MALE

				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	1,005	0.0000	0.04%	0.04%	0.4	0.4	0%	0%
25-29	1	4,326	0.0002	0.04%	0.04%	1.7	1.7	59%	59%
30-34	1	5,238	0.0002	0.04%	0.04%	2.3	2.3	44%	44%
35-39	1	6,168	0.0002	0.05%	0.05%	3.2	3.2	32%	32%
40-44	6	6,731	0.0009	0.07%	0.07%	4.5	4.5	133%	133%
45-49	12	5,324	0.0023	0.10%	0.10%	5.0	5.0	239%	239%
50-54	9	3,057	0.0029	0.14%	0.14%	4.2	4.2	215%	215%
55-59	6	1,655	0.0036	0.21%	0.21%	3.4	3.4	178%	178%
60-64	2	828	0.0024	0.32%	0.32%	2.5	2.5	79%	79%
65-69	2	227	0.0088	0.53%	0.53%	1.1	1.1	182%	182%
70-74	0	0	N/A	0.98%	0.98%	-	-	0%	0%
Totals	40	34,559				28	28	142%	142%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
PUBLIC SAFETY - FEMALE

				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	220	0.0000	0.02%	0.02%	0.0	0.0	0%	0%
25-29	0	617	0.0000	0.02%	0.02%	0.1	0.1	0%	0%
30-34	0	639	0.0000	0.03%	0.03%	0.2	0.2	0%	0%
35-39	0	761	0.0000	0.04%	0.04%	0.3	0.3	0%	0%
40-44	0	874	0.0000	0.06%	0.06%	0.5	0.5	0%	0%
45-49	1	664	0.0015	0.08%	0.08%	0.5	0.5	201%	201%
50-54	1	476	0.0021	0.10%	0.10%	0.5	0.5	205%	205%
55-59	0	334	0.0000	0.14%	0.14%	0.5	0.5	0%	0%
60-64	1	163	0.0061	0.19%	0.19%	0.3	0.3	330%	330%
65-69	0	49	0.0000	0.30%	0.30%	0.1	0.1	0%	0%
70-74	0	0	N/A	0.60%	0.60%	-	-	0%	0%
Totals	3	4,797				3	3	98%	98%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FIREFIGHTERS - MALE

				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	237	0.0000	0.04%	0.04%	0.1	0.1	0%	0%
25-29	0	990	0.0000	0.04%	0.04%	0.4	0.4	0%	0%
30-34	0	1,294	0.0000	0.04%	0.04%	0.6	0.6	0%	0%
35-39	0	1,875	0.0000	0.05%	0.05%	1.0	1.0	0%	0%
40-44	1	2,322	0.0004	0.07%	0.07%	1.6	1.6	64%	64%
45-49	3	1,811	0.0017	0.10%	0.10%	1.7	1.7	175%	175%
50-54	0	1,104	0.0000	0.14%	0.14%	1.5	1.5	0%	0%
55-59	0	633	0.0000	0.21%	0.21%	1.3	1.3	0%	0%
60-64	2	296	0.0068	0.32%	0.32%	0.9	0.9	220%	220%
65-69	0	75	0.0000	0.53%	0.53%	0.4	0.4	0%	0%
70-74	0	0	N/A	0.98%	0.98%	-	-	0%	0%
Totals	6	10,637				9	9	64%	64%

*Column may not add due to rounding.
*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

ACTIVE MORTALITY EXPERIENCE
FIREFIGHTERS - FEMALE

				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	40	0.0000	0.02%	0.02%	0.0	0.0	0%	0%
25-29	0	106	0.0000	0.02%	0.02%	0.0	0.0	0%	0%
30-34	0	68	0.0000	0.03%	0.03%	0.0	0.0	0%	0%
35-39	0	94	0.0000	0.04%	0.04%	0.1	0.1	0%	0%
40-44	0	88	0.0000	0.06%	0.06%	0.1	0.1	0%	0%
45-49	0	45	0.0000	0.08%	0.08%	0.1	0.1	0%	0%
50-54	0	43	0.0000	0.10%	0.10%	0.1	0.1	0%	0%
55-59	0	11	0.0000	0.14%	0.14%	0.0	0.0	0%	0%
60-64	0	6	0.0000	0.19%	0.19%	0.0	0.0	0%	0%
65-69	0	0	N/A	0.30%	0.30%	-	-	0%	0%
70-74	0	0	N/A	0.60%	0.60%	-	-	0%	0%
Totals	0	501				0	0	0%	0%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	937	0.0000	0.01%	0.01%	0.1	0.1	0%	0%
25-29	0	2,886	0.0000	0.03%	0.02%	0.8	0.6	0%	0%
30-34	0	4,672	0.0000	0.05%	0.04%	2.4	1.9	0%	0%
35-39	2	6,856	0.0003	0.07%	0.05%	4.6	3.5	44%	57%
40-44	3	8,468	0.0004	0.10%	0.08%	8.4	6.4	36%	47%
45-49	5	8,049	0.0006	0.15%	0.12%	11.9	9.2	42%	55%
50-54	9	7,614	0.0012	0.20%	0.15%	15.2	11.7	59%	77%
55-59	7	6,654	0.0011	0.31%	0.24%	20.4	15.7	34%	45%
60-64	20	5,621	0.0036	0.38%	0.30%	21.5	16.6	93%	121%
65-69	0	2,693	0.0000	0.41%	0.32%	11.0	8.5	0%	0%
70-74	1	908	0.0011	0.41%	0.32%	3.7	2.9	27%	35%
Totals	47	55,358				100	77	47%	61%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

DISABILITY EXPERIENCE
FEMALE 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	1,333	0.0000	0.01%	0.01%	0.2	0.2	0%	0%
25-29	0	4,441	0.0000	0.03%	0.02%	1.3	1.0	0%	0%
30-34	1	5,950	0.0002	0.05%	0.04%	3.0	2.3	33%	43%
35-39	4	7,983	0.0005	0.07%	0.05%	5.3	4.1	75%	98%
40-44	5	11,003	0.0005	0.10%	0.08%	11.0	8.5	46%	59%
45-49	13	13,178	0.0010	0.15%	0.12%	19.6	15.1	66%	86%
50-54	21	13,809	0.0015	0.20%	0.15%	27.6	21.2	76%	99%
55-59	41	14,831	0.0028	0.31%	0.24%	45.9	35.3	89%	116%
60-64	51	13,821	0.0037	0.38%	0.30%	52.9	40.7	96%	125%
65-69	4	5,511	0.0007	0.41%	0.32%	22.6	17.4	18%	23%
70-74	1	1,078	0.0009	0.41%	0.32%	4.4	3.4	23%	29%
Totals	141	92,938				194	149	73%	95%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	2,086	0.0000	0.01%	0.01%	0.3	0.2	0%	0%
25-29	0	3,963	0.0000	0.03%	0.02%	1.1	0.9	0%	0%
30-34	0	5,592	0.0000	0.05%	0.04%	2.9	2.2	0%	0%
35-39	2	7,192	0.0003	0.07%	0.05%	4.8	3.7	42%	54%
40-44	2	8,310	0.0002	0.10%	0.08%	8.2	6.3	24%	32%
45-49	3	7,532	0.0004	0.15%	0.12%	11.1	8.6	27%	35%
50-54	11	6,331	0.0017	0.20%	0.15%	12.6	9.7	87%	114%
55-59	11	5,591	0.0020	0.31%	0.24%	17.2	13.2	64%	83%
60-64	26	4,693	0.0055	0.38%	0.30%	18.0	13.8	145%	188%
65-69	2	2,054	0.0010	0.41%	0.32%	8.4	6.5	24%	31%
70-74	0	430	0.0000	0.41%	0.32%	1.8	1.4	0%	0%
Totals	57	53,774				86	66	66%	86%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	1,349	0.0000	0.01%	0.01%	0.2	0.1	0%	0%
25-29	0	3,342	0.0000	0.03%	0.02%	0.9	0.6	0%	0%
30-34	0	4,184	0.0000	0.05%	0.03%	2.1	1.3	0%	0%
35-39	0	4,974	0.0000	0.07%	0.04%	3.3	2.0	0%	0%
40-44	2	6,028	0.0003	0.10%	0.06%	6.0	3.7	34%	54%
45-49	3	6,232	0.0005	0.15%	0.09%	9.2	5.7	32%	53%
50-54	9	5,665	0.0016	0.20%	0.12%	11.3	6.9	80%	130%
55-59	7	5,400	0.0013	0.31%	0.19%	16.7	10.3	42%	68%
60-64	9	4,867	0.0018	0.38%	0.24%	18.6	11.5	48%	78%
65-69	1	1,962	0.0005	0.41%	0.25%	8.0	4.9	12%	20%
70-74	0	388	0.0000	0.41%	0.25%	1.6	1.0	0%	0%
Totals	31	44,391				78	48	40%	65%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	841	0.0000	0.01%	0.01%	0.1	0.1	0%	0%
25-29	0	3,273	0.0000	0.02%	0.01%	0.7	0.4	0%	0%
30-34	0	5,000	0.0000	0.04%	0.02%	1.8	1.2	0%	0%
35-39	1	6,026	0.0002	0.05%	0.03%	2.8	1.9	36%	54%
40-44	3	6,660	0.0005	0.07%	0.05%	4.6	3.0	66%	99%
45-49	0	5,974	0.0000	0.10%	0.07%	6.1	4.1	0%	0%
50-54	1	5,286	0.0002	0.14%	0.09%	7.3	4.8	14%	21%
55-59	4	3,474	0.0012	0.22%	0.14%	7.3	4.9	55%	82%
60-64	7	2,327	0.0030	0.27%	0.18%	6.2	4.1	114%	171%
65-69	0	935	0.0000	0.28%	0.19%	2.7	1.8	0%	0%
70-74	0	309	0.0000	0.28%	0.19%	0.9	0.6	0%	0%
Totals	16	40,105				40	27	40%	60%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

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	2,914	0.0000	0.01%	0.01%	0.4	0.2	0%	0%
25-29	0	13,184	0.0000	0.02%	0.01%	2.8	1.7	0%	0%
30-34	0	12,178	0.0000	0.04%	0.02%	4.7	2.8	0%	0%
35-39	4	14,363	0.0003	0.05%	0.03%	7.4	4.4	54%	90%
40-44	5	17,958	0.0003	0.08%	0.05%	13.7	8.2	36%	61%
45-49	5	19,054	0.0003	0.12%	0.07%	21.7	13.0	23%	38%
50-54	14	15,412	0.0009	0.15%	0.09%	23.4	14.0	60%	100%
55-59	20	11,290	0.0018	0.24%	0.14%	26.7	16.0	75%	125%
60-64	11	8,147	0.0014	0.30%	0.18%	23.9	14.4	46%	77%
65-69	0	2,842	0.0000	0.32%	0.19%	9.0	5.4	0%	0%
70-74	0	404	0.0000	0.32%	0.19%	1.3	0.8	0%	0%
Totals	59	117,746				135	81	44%	73%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

DISABILITY EXPERIENCE
PUBLIC SAFETY - MALE & FEMALE 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	1,225	0.0000	0.02%	0.02%	0.2	0.2	0%	0%
25-29	0	4,943	0.0000	0.03%	0.03%	1.6	1.6	0%	0%
30-34	1	5,877	0.0002	0.06%	0.06%	3.5	3.5	29%	29%
35-39	3	6,916	0.0004	0.08%	0.08%	5.3	5.3	56%	56%
40-44	8	6,629	0.0012	0.11%	0.11%	7.4	7.4	108%	108%
45-49	6	3,312	0.0018	0.17%	0.17%	5.6	5.6	108%	108%
50-54	2	1,322	0.0015	0.23%	0.23%	2.9	2.9	68%	68%
55-59	3	635	0.0047	0.36%	0.36%	2.2	2.2	135%	135%
60-64	1	265	0.0038	0.44%	0.44%	1.2	1.2	86%	86%
65-69	0	0	N/A	0.47%	0.47%	0	0	0%	0%
70-74	0	0	N/A	0.47%	0.47%	0	0	0%	0%
Totals	24	31,124				30	30	80%	80%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

DISABILITY EXPERIENCE
FIREFIGHTERS - MALE & FEMALE 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	277	0.0000	0.05%	0.04%	0.2	0.1	0%	0%
25-29	0	1,093	0.0000	0.09%	0.07%	1.1	0.9	0%	0%
30-34	0	1,355	0.0000	0.19%	0.14%	2.5	1.9	0%	0%
35-39	2	1,950	0.0010	0.24%	0.18%	4.7	3.6	42%	55%
40-44	7	2,137	0.0033	0.35%	0.27%	7.5	5.8	93%	121%
45-49	5	1,048	0.0048	0.54%	0.41%	5.5	4.2	91%	118%
50-54	1	381	0.0026	0.71%	0.54%	2.6	2.0	38%	50%
55-59	2	140	0.0143	1.13%	0.86%	1.5	1.2	130%	169%
60-64	0	70	0.0000	1.39%	1.06%	1.0	0.7	0%	0%
65-69	0	0	N/A	1.48%	1.13%	0	0	0%	0%
70-74	0	0	N/A	1.48%	1.13%	0	0	0%	0%
Totals	17	8,451				27	20	64%	83%

*Column may not add due to rounding.

*Column (5) and (6) represent the rate at the age mid-point for the quintile group

Summary of Data and Experience

TERMINATION EXPERIENCE
MALE STATE EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 50,685	$ 153,686	0.3298	27.00%	27.00%	$ 41,495	$ 41,495	122%	122%
1	53,615	246,951	0.2171	20.00%	20.00%	49,390	49,390	109%	109%
2	29,578	227,158	0.1302	12.00%	12.00%	27,259	27,259	109%	109%
3	23,462	223,855	0.1048	10.00%	10.00%	22,385	22,385	105%	105%
4	21,344	222,748	0.0958	9.00%	9.00%	20,047	20,047	106%	106%
5	18,148	221,781	0.0818	8.00%	8.00%	17,743	17,743	102%	102%
6	18,211	227,300	0.0801	7.00%	7.00%	15,911	15,911	114%	114%
7	13,834	224,246	0.0617	6.00%	6.00%	13,455	13,455	103%	103%
8	12,272	221,772	0.0553	5.00%	5.00%	11,089	11,089	111%	111%
9	11,852	215,896	0.0549	5.00%	5.00%	10,795	10,795	110%	110%
10	11,328	210,272	0.0539	4.50%	4.50%	9,462	9,462	120%	120%
11	10,111	204,204	0.0495	4.50%	4.50%	9,189	9,189	110%	110%
12	8,792	204,540	0.0430	4.00%	4.00%	8,182	8,182	107%	107%
13	8,042	202,665	0.0397	3.75%	3.75%	7,600	7,600	106%	106%
14	7,953	201,901	0.0394	3.50%	3.50%	7,067	7,067	113%	113%
15	7,345	195,039	0.0377	3.00%	3.00%	5,851	5,851	126%	126%
16	5,796	188,131	0.0308	2.75%	2.75%	5,174	5,174	112%	112%
17	5,270	182,883	0.0288	2.50%	2.50%	4,572	4,572	115%	115%
18	3,770	176,246	0.0214	2.00%	2.00%	3,525	3,525	107%	107%
19	3,896	165,195	0.0236	2.00%	2.00%	3,304	3,304	118%	118%
20	3,853	161,097	0.0239	2.00%	2.00%	3,222	3,222	120%	120%
21	3,714	155,186	0.0239	2.00%	2.00%	3,104	3,104	120%	120%
22	2,662	147,751	0.0180	2.00%	2.00%	2,955	2,955	90%	90%
23	2,260	139,897	0.0162	1.50%	1.50%	2,098	2,098	108%	108%
24	3,871	55,155	0.0702	1.50%	1.50%	827	827	468%	468%
Total	$ 341,664	$ 4,775,555				$ 305,701	$ 305,701	112%	112%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
FEMALE STATE EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 62,590	$ 188,997	0.3312	28.00%	28.00%	$ 52,919	$ 52,919	118%	118%
1	73,807	304,919	0.2421	21.00%	21.00%	64,033	64,033	115%	115%
2	42,733	278,141	0.1536	15.00%	15.00%	41,721	41,721	102%	102%
3	33,831	273,881	0.1235	13.00%	13.00%	35,605	35,605	95%	95%
4	29,998	269,292	0.1114	11.00%	11.00%	29,622	29,622	101%	101%
5	29,088	272,262	0.1068	10.00%	10.00%	27,226	27,226	107%	107%
6	26,864	285,598	0.0941	8.50%	8.50%	24,276	24,276	111%	111%
7	22,725	287,656	0.0790	7.25%	7.25%	20,855	20,855	109%	109%
8	20,717	287,322	0.0721	6.25%	6.25%	17,958	17,958	115%	115%
9	18,956	279,544	0.0678	5.75%	5.75%	16,074	16,074	118%	118%
10	16,017	271,938	0.0589	5.25%	5.25%	14,277	14,277	112%	112%
11	14,034	268,600	0.0522	4.50%	4.50%	12,087	12,087	116%	116%
12	12,149	267,195	0.0455	4.25%	4.25%	11,356	11,356	107%	107%
13	11,280	272,365	0.0414	4.00%	4.00%	10,895	10,895	104%	104%
14	11,010	269,084	0.0409	3.75%	3.75%	10,091	10,091	109%	109%
15	10,638	257,758	0.0413	3.50%	3.50%	9,022	9,022	118%	118%
16	8,874	247,115	0.0359	3.00%	3.00%	7,413	7,413	120%	120%
17	8,527	236,858	0.0360	2.75%	2.75%	6,514	6,514	131%	131%
18	8,011	224,921	0.0356	2.75%	2.75%	6,185	6,185	130%	130%
19	6,333	198,331	0.0319	2.75%	2.75%	5,454	5,454	116%	116%
20	6,341	179,560	0.0353	2.75%	2.75%	4,938	4,938	128%	128%
21	4,605	168,647	0.0273	2.50%	2.50%	4,216	4,216	109%	109%
22	4,041	154,859	0.0261	2.25%	2.25%	3,484	3,484	116%	116%
23	3,174	143,824	0.0221	2.00%	2.00%	2,876	2,876	110%	110%
24	2,102	55,646	0.0378	2.00%	2.00%	1,113	1,113	189%	189%
Total	$ 488,445	$ 5,944,313				$ 440,210	$ 440,210	111%	111%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 45,022	$ 188,258	0.2392	18.00%	19.00%	$ 33,886	$ 35,769	133%	126%
1	50,288	308,279	0.1631	13.00%	13.00%	40,076	40,076	125%	125%
2	28,818	271,113	0.1063	9.00%	10.00%	24,400	27,111	118%	106%
3	24,086	252,599	0.0954	8.50%	9.00%	21,471	22,734	112%	106%
4	19,945	231,852	0.0860	7.50%	8.00%	17,389	18,548	115%	108%
5	16,013	220,458	0.0726	7.00%	7.00%	15,432	15,432	104%	104%
6	16,470	220,806	0.0746	6.50%	6.50%	14,352	14,352	115%	115%
7	13,639	217,152	0.0628	5.50%	5.50%	11,943	11,943	114%	114%
8	13,554	217,144	0.0624	5.00%	5.00%	10,857	10,857	125%	125%
9	9,849	209,497	0.0470	4.50%	4.50%	9,427	9,427	104%	104%
10	8,693	204,540	0.0425	4.00%	4.00%	8,182	8,182	106%	106%
11	7,966	207,411	0.0384	3.50%	3.50%	7,259	7,259	110%	110%
12	8,987	203,956	0.0441	3.25%	3.25%	6,629	6,629	136%	136%
13	6,520	201,830	0.0323	3.00%	3.00%	6,055	6,055	108%	108%
14	6,647	199,282	0.0334	3.00%	3.00%	5,978	5,978	111%	111%
15	4,954	189,564	0.0261	2.75%	2.75%	5,213	5,213	95%	95%
16	6,048	178,540	0.0339	2.75%	2.75%	4,910	4,910	123%	123%
17	4,728	170,701	0.0277	2.50%	2.50%	4,268	4,268	111%	111%
18	4,744	166,586	0.0285	2.50%	2.50%	4,165	4,165	114%	114%
19	4,699	152,051	0.0309	2.50%	2.50%	3,801	3,801	124%	124%
20	4,618	141,950	0.0325	2.00%	2.00%	2,839	2,839	163%	163%
21	2,771	135,095	0.0205	2.00%	2.00%	2,702	2,702	103%	103%
22	2,475	123,098	0.0201	1.75%	1.75%	2,154	2,154	115%	115%
23	2,817	112,195	0.0251	1.50%	1.50%	1,683	1,683	167%	167%
24	1,766	45,684	0.0387	1.25%	1.25%	571	571	309%	309%
Total	$ 316,117	$ 4,769,641				$ 265,642	$ 272,658	119%	116%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 50,155	$ 159,711	0.3140	24.00%	26.00%	$ 38,331	$ 41,525	131%	121%
1	52,472	243,656	0.2154	18.00%	18.00%	43,858	43,858	120%	120%
2	30,510	201,675	0.1513	14.00%	15.00%	28,235	30,251	108%	101%
3	25,046	180,478	0.1388	12.00%	13.00%	21,657	23,462	116%	107%
4	20,623	163,168	0.1264	11.00%	11.50%	17,949	18,764	115%	110%
5	15,326	149,024	0.1028	9.50%	9.50%	14,157	14,157	108%	108%
6	14,465	146,606	0.0987	9.00%	9.00%	13,195	13,195	110%	110%
7	11,770	140,363	0.0839	8.00%	8.00%	11,229	11,229	105%	105%
8	10,695	137,240	0.0779	6.50%	7.00%	8,921	9,607	120%	111%
9	9,363	134,682	0.0695	6.50%	6.00%	8,754	8,081	107%	116%
10	8,230	126,982	0.0648	5.50%	5.50%	6,984	6,984	118%	118%
11	7,498	124,859	0.0601	5.00%	5.00%	6,243	6,243	120%	120%
12	6,756	122,142	0.0553	4.75%	4.75%	5,802	5,802	116%	116%
13	6,569	120,980	0.0543	4.50%	4.50%	5,444	5,444	121%	121%
14	5,605	118,712	0.0472	4.00%	4.00%	4,748	4,748	118%	118%
15	5,215	114,781	0.0454	4.00%	4.00%	4,591	4,591	114%	114%
16	4,889	106,635	0.0458	3.75%	3.75%	3,999	3,999	122%	122%
17	3,567	98,220	0.0363	3.50%	3.50%	3,438	3,438	104%	104%
18	3,308	94,894	0.0349	3.00%	3.00%	2,847	2,847	116%	116%
19	2,836	86,508	0.0328	3.00%	3.00%	2,595	2,595	109%	109%
20	2,316	76,724	0.0302	2.50%	2.50%	1,918	1,918	121%	121%
21	2,810	72,125	0.0390	2.50%	2.50%	1,803	1,803	156%	156%
22	2,019	64,790	0.0312	2.25%	2.25%	1,458	1,458	138%	138%
23	2,075	57,290	0.0362	2.00%	2.00%	1,146	1,146	181%	181%
24	1,423	23,658	0.0601	2.00%	2.00%	473	473	301%	301%
Total	$ 305,541	$ 3,065,903				$ 259,775	$ 267,618	118%	114%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
MALE EDUCATORS
WEIGHTED BY SALARY

Service	Actual Terminations	Total Exposures	Actual Rate	Assumed Rate		Expected Terminations		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 27,472	$ 142,464	0.1928	16.00%	16.00%	$ 22,794	$ 22,794	121%	121%
1	30,730	225,831	0.1361	12.00%	12.00%	27,100	27,100	113%	113%
2	20,676	207,468	0.0997	8.50%	8.50%	17,635	17,635	117%	117%
3	15,336	188,856	0.0812	7.00%	7.00%	13,220	13,220	116%	116%
4	12,300	171,596	0.0717	6.50%	6.50%	11,154	11,154	110%	110%
5	11,637	162,229	0.0717	6.00%	6.00%	9,734	9,734	120%	120%
6	9,506	151,149	0.0629	5.50%	5.50%	8,313	8,313	114%	114%
7	7,230	148,737	0.0486	4.50%	4.50%	6,693	6,693	108%	108%
8	6,633	148,542	0.0447	4.00%	4.00%	5,942	5,942	112%	112%
9	5,744	147,955	0.0388	3.50%	3.50%	5,178	5,178	111%	111%
10	5,093	146,193	0.0348	3.00%	3.00%	4,386	4,386	116%	116%
11	4,510	143,250	0.0315	2.75%	2.75%	3,939	3,939	114%	114%
12	3,653	141,254	0.0259	2.75%	2.50%	3,884	3,531	94%	103%
13	3,061	141,554	0.0216	2.25%	2.00%	3,185	2,831	96%	108%
14	2,815	138,924	0.0203	2.00%	1.75%	2,778	2,431	101%	116%
15	2,890	138,439	0.0209	2.00%	1.75%	2,769	2,423	104%	119%
16	2,784	131,883	0.0211	2.00%	1.50%	2,638	1,978	106%	141%
17	1,747	128,462	0.0136	2.00%	1.50%	2,569	1,927	68%	91%
18	2,039	124,007	0.0164	2.00%	1.50%	2,480	1,860	82%	110%
19	1,426	118,783	0.0120	1.50%	1.50%	1,782	1,782	80%	80%
20	2,231	114,620	0.0195	1.50%	1.50%	1,719	1,719	130%	130%
21	2,122	115,000	0.0185	1.50%	1.50%	1,725	1,725	123%	123%
22	1,737	109,589	0.0159	1.50%	1.50%	1,644	1,644	106%	106%
23	1,867	101,850	0.0183	1.50%	1.50%	1,528	1,528	122%	122%
24	1,097	34,532	0.0318	1.50%	1.50%	518	518	212%	212%
Total	$ 186,336	$ 3,523,167				$ 165,307	$ 161,985	113%	115%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
FEMALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 67,751	$ 380,584	0.1780	17.00%	16.00%	$ 64,699	$ 60,893	105%	111%
1	90,817	611,912	0.1484	14.00%	13.00%	85,668	79,549	106%	114%
2	68,083	574,324	0.1185	11.00%	10.00%	63,176	57,432	108%	119%
3	56,935	534,006	0.1066	10.00%	9.00%	53,401	48,061	107%	118%
4	47,229	495,291	0.0954	9.00%	8.00%	44,576	39,623	106%	119%
5	38,694	465,935	0.0830	8.00%	7.00%	37,275	32,615	104%	119%
6	30,724	444,348	0.0691	7.00%	6.00%	31,104	26,661	99%	115%
7	25,005	432,984	0.0578	5.50%	5.25%	23,814	22,732	105%	110%
8	20,559	424,823	0.0484	4.75%	4.50%	20,179	19,117	102%	108%
9	19,039	409,091	0.0465	4.25%	4.00%	17,386	16,364	110%	116%
10	16,597	395,059	0.0420	4.00%	3.75%	15,802	14,815	105%	112%
11	14,492	382,192	0.0379	3.50%	3.25%	13,377	12,421	108%	117%
12	11,598	373,876	0.0310	3.00%	3.00%	11,216	11,216	103%	103%
13	12,081	363,256	0.0333	2.50%	2.50%	9,081	9,081	133%	133%
14	8,374	346,357	0.0242	2.00%	2.00%	6,927	6,927	121%	121%
15	7,717	322,760	0.0239	2.00%	2.00%	6,455	6,455	120%	120%
16	6,323	301,398	0.0210	1.75%	1.75%	5,274	5,274	120%	120%
17	5,803	280,988	0.0207	1.75%	1.75%	4,917	4,917	118%	118%
18	5,826	264,529	0.0220	1.75%	1.75%	4,629	4,629	126%	126%
19	4,031	232,924	0.0173	1.50%	1.50%	3,494	3,494	115%	115%
20	3,926	211,627	0.0186	1.50%	1.50%	3,174	3,174	124%	124%
21	3,827	197,457	0.0194	1.50%	1.50%	2,962	2,962	129%	129%
22	2,074	183,105	0.0113	1.50%	1.50%	2,747	2,747	76%	76%
23	2,055	168,940	0.0122	1.50%	1.50%	2,534	2,534	81%	81%
24	2,223	61,215	0.0363	1.50%	1.50%	918	918	242%	242%
Total	$ 571,783	$ 8,858,981				$ 534,785	$ 494,611	107%	116%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
PUBLIC SAFETY - MALE & FEMALE COMBINED
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 13,634	$ 80,818	0.1687	15.00%	15.00%	$ 12,123	$ 12,123	112%	112%
1	16,326	163,613	0.0998	8.00%	8.00%	13,089	13,089	125%	125%
2	11,174	155,273	0.0720	6.50%	7.00%	10,093	10,869	111%	103%
3	11,225	150,656	0.0745	6.00%	6.00%	9,039	9,039	124%	124%
4	8,664	141,770	0.0611	5.00%	5.50%	7,089	7,797	122%	111%
5	8,388	137,073	0.0612	4.50%	5.00%	6,168	6,854	136%	122%
6	6,365	136,983	0.0465	4.00%	4.50%	5,479	6,164	116%	103%
7	7,352	140,058	0.0525	4.00%	4.00%	5,602	5,602	131%	131%
8	5,841	141,741	0.0412	3.50%	3.50%	4,961	4,961	118%	118%
9	4,664	144,946	0.0322	3.00%	3.00%	4,348	4,348	107%	107%
10	5,557	151,655	0.0366	2.50%	2.50%	3,791	3,791	147%	147%
11	4,647	156,781	0.0296	2.50%	2.50%	3,920	3,920	119%	119%
12	3,730	156,371	0.0239	2.00%	2.50%	3,127	3,909	119%	95%
13	3,561	166,914	0.0213	2.00%	2.00%	3,338	3,338	107%	107%
14	4,042	173,364	0.0233	1.75%	2.00%	3,034	3,467	133%	117%
15	3,489	169,820	0.0205	1.75%	2.00%	2,972	3,396	117%	103%
16	1,944	167,544	0.0116	1.50%	1.50%	2,513	2,513	77%	77%
17	2,749	166,096	0.0166	1.50%	1.50%	2,491	2,491	110%	110%
18	1,643	162,413	0.0101	1.50%	1.50%	2,436	2,436	67%	67%
19	3,634	71,906	0.0505	1.50%	1.50%	1,079	1,079	337%	337%
Total	$ 128,629	$ 2,935,795				$ 106,692	$ 111,186	121%	116%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

TERMINATION EXPERIENCE
FIREFIGHTERS - MALE & FEMALE COMBINED
WEIGHTED BY SALARY

				Assumed Rate		Expected Terminations		Actual/Expected	
Service	Actual Terminations	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 2,137	$ 21,245	0.1006	7.00%	7.00%	$ 1,487	$ 1,487	144%	144%
1	2,574	43,348	0.0594	5.50%	5.50%	2,384	2,384	108%	108%
2	1,823	41,672	0.0437	4.00%	4.00%	1,667	1,667	109%	109%
3	1,888	40,684	0.0464	3.50%	3.75%	1,424	1,526	133%	124%
4	1,293	37,337	0.0346	3.00%	3.00%	1,120	1,120	115%	115%
5	933	37,370	0.0250	2.50%	2.50%	934	934	100%	100%
6	1,009	39,277	0.0257	2.00%	2.25%	786	884	128%	114%
7	832	41,578	0.0200	1.75%	2.00%	728	832	114%	100%
8	973	44,942	0.0217	1.50%	1.75%	674	786	144%	124%
9	692	45,337	0.0153	1.50%	1.75%	680	793	102%	87%
10	1,119	50,028	0.0224	1.50%	1.75%	750	875	149%	128%
11	844	51,260	0.0165	1.50%	1.50%	769	769	110%	110%
12	1,146	52,283	0.0219	1.00%	1.25%	523	654	219%	175%
13	694	55,571	0.0125	0.50%	1.25%	278	695	250%	100%
14	311	55,631	0.0056	0.50%	1.00%	278	556	112%	56%
15	1,054	53,525	0.0197	0.50%	1.00%	268	535	393%	197%
16	324	52,167	0.0062	0.50%	1.00%	261	522	124%	62%
17	891	51,525	0.0173	0.50%	1.00%	258	515	345%	173%
18	496	52,054	0.0095	0.50%	1.00%	260	521	191%	95%
19	853	24,831	0.0344	0.50%	1.00%	124	248	688%	344%
Total	$ 21,886	$ 891,665				$ 15,653	$ 18,303	140%	120%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE STATE EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 807	$ 2,082	0.3876	20.00%	20.00%	$ 416	$ 416	194%	194%
50	669	2,643	0.2531	15.00%	15.00%	396	396	169%	169%
51	1,232	5,371	0.2294	15.00%	15.00%	806	806	153%	153%
52	590	5,647	0.1045	15.00%	15.00%	847	847	70%	70%
53	591	8,284	0.0713	15.00%	15.00%	1,243	1,243	48%	48%
54	1,835	12,232	0.1500	15.00%	15.00%	1,835	1,835	100%	100%
55	2,172	16,980	0.1279	16.00%	16.00%	2,717	2,717	80%	80%
56	2,582	20,653	0.1250	16.00%	16.00%	3,305	3,305	78%	78%
57	2,689	25,548	0.1053	16.00%	16.00%	4,088	4,088	66%	66%
58	3,224	30,026	0.1074	16.00%	16.00%	4,804	4,804	67%	67%
59	4,850	33,897	0.1431	16.00%	16.00%	5,424	5,424	89%	89%
60	5,282	33,033	0.1599	20.00%	20.00%	6,607	6,607	80%	80%
61	5,583	32,966	0.1694	20.00%	20.00%	6,593	6,593	85%	85%
62	7,545	32,415	0.2328	30.00%	30.00%	9,725	9,725	78%	78%
63	8,232	28,862	0.2852	30.00%	30.00%	8,659	8,659	95%	95%
64	4,877	22,967	0.2123	30.00%	30.00%	6,890	6,890	71%	71%
65	12,515	64,580	0.1938	22.00%	22.00%	14,208	14,208	88%	88%
66	14,642	50,640	0.2891	22.00%	22.00%	11,141	11,141	131%	131%
67	10,135	35,983	0.2817	22.00%	22.00%	7,916	7,916	128%	128%
68	6,410	27,126	0.2363	22.00%	22.00%	5,968	5,968	107%	107%
69	3,601	20,795	0.1732	22.00%	22.00%	4,575	4,575	79%	79%
70	4,323	16,352	0.2644	22.00%	22.00%	3,597	3,597	120%	120%
71	2,772	12,375	0.2240	22.00%	22.00%	2,722	2,722	102%	102%
72	2,691	10,332	0.2605	22.00%	22.00%	2,273	2,273	118%	118%
73	1,729	7,675	0.2253	22.00%	22.00%	1,689	1,689	102%	102%
74	988	5,597	0.1765	22.00%	22.00%	1,231	1,231	80%	80%
Subtotal	$ 112,566	$ 565,061				$ 119,673	$ 119,673	94%	94%
75 or more	4,924	19,254	0.2557	100.00%	100.00%	19,254	19,254	26%	26%
Totals	$ 117,490	$ 584,315				$ 138,927	$ 138,927	85%	85%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE STATE EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 330	$ 41,015	0.0080	2.30%	2.30%	$ 860	$ 860	38%	38%
50	384	18,578	0.0207	2.30%	2.30%	427	427	90%	90%
51	266	21,576	0.0123	2.30%	2.30%	496	496	54%	54%
52	490	27,957	0.0175	2.50%	2.50%	699	699	70%	70%
53	314	29,887	0.0105	2.50%	2.50%	747	747	42%	42%
54	514	30,714	0.0167	2.50%	2.50%	768	768	67%	67%
55	809	30,019	0.0269	2.50%	2.50%	751	751	108%	108%
56	428	27,505	0.0156	2.50%	2.50%	688	688	62%	62%
57	837	25,456	0.0329	2.50%	2.50%	636	636	132%	132%
58	123	23,344	0.0053	2.50%	2.50%	584	584	21%	21%
59	334	22,174	0.0151	4.00%	4.00%	887	887	38%	38%
60	2,029	38,712	0.0524	5.00%	5.00%	1,936	1,936	105%	105%
61	2,089	36,531	0.0572	5.00%	5.00%	1,827	1,827	114%	114%
62	5,387	60,019	0.0898	11.00%	11.00%	6,602	6,602	82%	82%
63	5,061	53,018	0.0955	11.00%	11.00%	5,832	5,832	87%	87%
64	3,980	47,254	0.0842	11.00%	11.00%	5,198	5,198	77%	77%
Totals	$ 23,375	$ 533,759				$ 28,937	$ 28,937	81%	81%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
FEMALE STATE EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 340	$ 1,755	0.1937	17.00%	17.00%	$ 298	$ 298	114%	114%
50	170	2,742	0.0620	17.00%	17.00%	466	466	36%	36%
51	488	5,251	0.0929	16.00%	16.00%	840	840	58%	58%
52	1,147	8,624	0.1330	16.00%	16.00%	1,380	1,380	83%	83%
53	2,244	13,955	0.1608	16.00%	16.00%	2,233	2,233	101%	101%
54	1,509	15,894	0.0949	16.00%	16.00%	2,543	2,543	59%	59%
55	2,681	20,285	0.1322	16.00%	16.00%	3,246	3,246	83%	83%
56	2,646	22,385	0.1182	16.00%	16.00%	3,582	3,582	74%	74%
57	3,177	23,126	0.1374	16.00%	16.00%	3,700	3,700	86%	86%
58	4,362	25,156	0.1734	20.00%	20.00%	5,031	5,031	87%	87%
59	3,966	26,554	0.1494	20.00%	20.00%	5,311	5,311	75%	75%
60	5,655	26,715	0.2117	25.00%	25.00%	6,679	6,679	85%	85%
61	4,919	26,271	0.1872	25.00%	25.00%	6,568	6,568	75%	75%
62	6,846	27,539	0.2486	33.00%	33.00%	9,088	9,088	75%	75%
63	6,378	26,545	0.2403	33.00%	33.00%	8,760	8,760	73%	73%
64	7,071	22,829	0.3097	33.00%	33.00%	7,534	7,534	94%	94%
65	23,776	96,068	0.2475	28.00%	28.00%	26,899	26,899	88%	88%
66	22,837	73,856	0.3092	28.00%	28.00%	20,680	20,680	110%	110%
67	15,866	49,087	0.3232	28.00%	28.00%	13,744	13,744	115%	115%
68	7,777	33,106	0.2349	22.00%	22.00%	7,283	7,283	107%	107%
69	4,950	23,572	0.2100	22.00%	22.00%	5,186	5,186	95%	95%
70	6,024	19,549	0.3081	22.00%	22.00%	4,301	4,301	140%	140%
71	4,181	13,435	0.3112	22.00%	22.00%	2,956	2,956	141%	141%
72	2,202	9,127	0.2413	22.00%	22.00%	2,008	2,008	110%	110%
73	1,272	6,570	0.1936	22.00%	22.00%	1,445	1,445	88%	88%
74	1,086	5,075	0.2140	22.00%	22.00%	1,117	1,117	97%	97%
Subtotal	$ 143,570	$ 625,071				$ 152,876	$ 152,876	94%	94%
75 or more	3,607	13,521	0.2668	100.00%	100.00%	13,521	13,521	27%	27%
Totals	$ 147,177	$ 638,592				$ 166,397	$ 166,397	88%	88%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE STATE EMPLOYEES
WEIGHTED BY SALARY

Age	Actual Retirements	Total Exposures	Actual Rate	Assumed Rate		Expected Retirements		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 424	$ 59,380	0.0071	2.00%	2.00%	$ 860	$ 860	49%	49%
50	135	23,281	0.0058	2.00%	2.00%	466	466	29%	29%
51	317	25,069	0.0126	2.00%	2.00%	501	501	63%	63%
52	113	25,366	0.0045	2.00%	2.00%	507	507	22%	22%
53	237	22,006	0.0108	2.00%	2.00%	440	440	54%	54%
54	0	19,220	0.0000	2.00%	2.00%	384	384	0%	0%
55	489	20,369	0.0240	4.00%	4.00%	815	815	60%	60%
56	212	20,659	0.0103	4.00%	4.00%	826	826	26%	26%
57	432	21,752	0.0199	4.00%	4.00%	870	870	50%	50%
58	511	26,298	0.0194	4.00%	4.00%	1,052	1,052	49%	49%
59	748	27,874	0.0268	4.00%	4.00%	1,115	1,115	67%	67%
60	5,918	63,907	0.0926	9.00%	9.00%	5,752	5,752	103%	103%
61	5,122	61,552	0.0832	9.00%	9.00%	5,540	5,540	92%	92%
62	12,406	108,833	0.1140	14.00%	14.00%	15,237	15,237	81%	81%
63	11,965	96,510	0.1240	14.00%	14.00%	13,511	13,511	89%	89%
64	9,229	84,926	0.1087	14.00%	14.00%	11,890	11,890	78%	78%
Totals	$ 48,258	$ 707,002				$ 59,766	$ 59,766	81%	81%

*$ in thousands
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Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 540	$ 1,642	0.3289	15.00%	15.00%	$ 246	$ 246	219%	219%
50	317	2,027	0.1564	15.00%	15.00%	304	304	104%	104%
51	483	3,197	0.1511	15.00%	15.00%	480	480	101%	101%
52	606	4,475	0.1354	15.00%	15.00%	671	671	90%	90%
53	609	6,636	0.0918	15.00%	12.00%	995	796	61%	76%
54	620	9,497	0.0653	15.00%	12.00%	1,425	1,140	44%	54%
55	1,447	10,673	0.1356	15.00%	12.00%	1,601	1,281	90%	113%
56	1,562	13,454	0.1161	15.00%	12.00%	2,018	1,615	77%	97%
57	1,512	15,461	0.0978	15.00%	12.00%	2,319	1,855	65%	81%
58	1,929	20,030	0.0963	15.00%	12.00%	3,005	2,404	64%	80%
59	3,008	23,715	0.1268	15.00%	15.00%	3,557	3,557	85%	85%
60	3,561	26,202	0.1359	20.00%	15.00%	5,241	3,930	68%	91%
61	3,563	25,063	0.1422	20.00%	15.00%	5,013	3,759	71%	95%
62	4,512	25,206	0.1790	23.00%	25.00%	5,797	6,301	78%	72%
63	4,459	21,189	0.2104	23.00%	25.00%	4,873	5,297	91%	84%
64	3,753	19,277	0.1947	23.00%	25.00%	4,434	4,819	85%	78%
65	12,888	58,019	0.2221	23.00%	25.00%	13,344	14,505	97%	89%
66	12,897	44,615	0.2891	23.00%	30.00%	10,262	13,385	126%	96%
67	9,384	28,956	0.3241	22.00%	30.00%	6,370	8,687	147%	108%
68	4,430	18,321	0.2418	22.00%	30.00%	4,031	5,496	110%	81%
69	2,586	12,327	0.2098	22.00%	30.00%	2,712	3,698	95%	70%
70	3,190	10,546	0.3025	22.00%	30.00%	2,320	3,164	138%	101%
71	2,058	6,616	0.3111	22.00%	30.00%	1,456	1,985	141%	104%
72	1,306	5,169	0.2527	22.00%	30.00%	1,137	1,551	115%	84%
73	1,037	4,131	0.2510	22.00%	30.00%	909	1,239	114%	84%
74	684	3,439	0.1989	22.00%	30.00%	757	1,032	90%	66%
Subtotal	$ 82,941	$ 419,883				$ 85,276	$ 93,197	97%	89%
75 or more	2,762	6,177	0.4471	100.00%	100.00%	7,199	7,199	38%	38%
Totals	$ 85,703	$ 426,060				$ 92,475	$ 100,396	93%	85%

*$ in thousands
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Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE LOCAL GOVERNMENT EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 945	$ 43,330	0.0218	2.30%	2.30%	$ 1,083	$ 1,083	87%	87%
50	241	13,341	0.0181	2.30%	2.30%	334	334	72%	72%
51	279	16,191	0.0172	2.30%	2.30%	405	405	69%	69%
52	631	17,336	0.0364	2.50%	2.50%	433	433	146%	146%
53	632	17,077	0.0370	2.50%	2.50%	427	427	148%	148%
54	58	17,884	0.0032	2.50%	2.50%	447	447	13%	13%
55	378	18,014	0.0210	2.50%	2.50%	540	540	70%	70%
56	182	17,105	0.0106	2.50%	2.50%	513	513	35%	35%
57	711	20,081	0.0354	2.50%	2.50%	602	602	118%	118%
58	154	20,588	0.0075	2.50%	2.50%	824	824	19%	19%
59	508	18,020	0.0282	4.00%	4.00%	721	721	70%	70%
60	827	29,201	0.0283	5.00%	5.00%	1,168	1,168	71%	71%
61	1,306	30,043	0.0435	5.00%	5.00%	1,202	1,202	109%	109%
62	3,522	51,509	0.0684	11.00%	11.00%	5,151	5,151	68%	68%
63	4,097	48,068	0.0852	11.00%	11.00%	4,807	4,807	85%	85%
64	3,761	43,132	0.0872	11.00%	11.00%	4,313	4,313	87%	87%
Totals	$ 18,232	$ 420,920				$ 22,970	$ 22,970	79%	79%

*$ in thousands
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Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 361	$ 1,180	0.3059	12.00%	12.00%	$ 142	$ 142	255%	255%
50	39	970	0.0402	12.00%	20.00%	116	194	34%	20%
51	526	1,998	0.2633	12.00%	20.00%	240	400	219%	132%
52	619	2,781	0.2226	12.00%	20.00%	334	556	185%	111%
53	1,519	4,105	0.3700	12.00%	20.00%	493	821	308%	185%
54	307	4,134	0.0743	12.00%	15.00%	496	620	62%	50%
55	660	5,831	0.1132	15.00%	15.00%	875	875	75%	75%
56	926	6,522	0.1420	15.00%	15.00%	978	978	95%	95%
57	790	7,054	0.1120	15.00%	15.00%	1,058	1,058	75%	75%
58	886	7,769	0.1140	15.00%	15.00%	1,165	1,165	76%	76%
59	2,014	8,454	0.2382	20.00%	20.00%	1,691	1,691	119%	119%
60	1,623	9,437	0.1720	20.00%	20.00%	1,888	1,888	86%	86%
61	1,364	9,496	0.1436	20.00%	20.00%	1,899	1,899	72%	72%
62	2,379	9,107	0.2612	28.00%	30.00%	2,550	2,732	93%	87%
63	2,477	8,083	0.3064	28.00%	30.00%	2,263	2,425	109%	102%
64	1,446	7,090	0.2039	28.00%	30.00%	1,985	2,127	73%	68%
65	10,132	37,342	0.2713	28.00%	30.00%	10,456	11,203	97%	90%
66	8,077	27,950	0.2890	28.00%	30.00%	7,826	8,385	103%	96%
67	4,891	18,204	0.2687	28.00%	30.00%	5,097	5,461	96%	90%
68	3,318	13,204	0.2513	28.00%	30.00%	3,697	3,961	90%	84%
69	2,667	9,963	0.2677	28.00%	30.00%	2,790	2,989	96%	89%
70	1,947	7,108	0.2739	30.00%	30.00%	2,133	2,133	91%	91%
71	1,646	5,433	0.3030	30.00%	30.00%	1,630	1,630	101%	101%
72	973	3,696	0.2633	30.00%	30.00%	1,109	1,109	88%	88%
73	408	2,482	0.1644	25.00%	25.00%	621	621	66%	66%
74	129	1,972	0.0654	25.00%	25.00%	493	493	26%	26%
Subtotal	$ 52,124	$ 221,365				$ 54,023	$ 57,555	96%	91%
75 or more	1,561	6,177	0.2527	100.00%	100.00%	6,177	6,177	25%	25%
Totals	$ 53,685	$ 227,542				$ 60,200	$ 63,732	89%	84%

*$ in thousands
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Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE LOCAL GOVERNMENT EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 364	$ 26,820	0.0136	2.00%	2.00%	$ 805	$ 805	45%	45%
50	164	8,130	0.0202	2.00%	2.00%	325	325	50%	50%
51	210	8,839	0.0238	2.00%	2.00%	354	354	59%	59%
52	35	9,251	0.0038	2.00%	2.00%	370	370	9%	9%
53	140	8,432	0.0166	2.00%	2.00%	337	337	42%	42%
54	373	8,142	0.0458	2.00%	2.00%	326	326	115%	115%
55	0	7,126	0.0000	4.00%	4.00%	285	285	0%	0%
56	96	7,685	0.0125	4.00%	4.00%	307	307	31%	31%
57	111	7,925	0.0140	4.00%	4.00%	317	317	35%	35%
58	502	9,527	0.0527	4.00%	4.00%	572	572	88%	88%
59	433	8,541	0.0507	4.00%	4.00%	512	512	85%	85%
60	1,672	21,400	0.0781	9.00%	9.00%	2,140	2,140	78%	78%
61	1,598	21,492	0.0744	9.00%	9.00%	2,794	2,794	57%	57%
62	4,074	41,036	0.0993	14.00%	14.00%	5,335	5,335	76%	76%
63	4,598	36,666	0.1254	14.00%	14.00%	4,767	4,767	96%	96%
64	3,715	32,321	0.1149	14.00%	14.00%	4,202	4,202	88%	88%
Totals	$ 18,085	$ 263,333				$ 23,747	$ 23,747	76%	76%

*$ in thousands
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Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ -	$ 71	0.0000	20.00%	20.00%	$ 14	$ 14	0%	0%
50	-	74	0.0000	20.00%	20.00%	15	15	0%	0%
51	237	397	0.5970	20.00%	20.00%	80	80	298%	298%
52	36	832	0.0433	20.00%	20.00%	167	167	22%	22%
53	247	1,970	0.1254	20.00%	20.00%	394	394	63%	63%
54	434	5,077	0.0855	15.00%	18.00%	762	914	57%	47%
55	2,301	12,178	0.1889	15.00%	18.00%	1,827	2,192	126%	105%
56	2,308	16,280	0.1418	15.00%	18.00%	2,442	2,930	95%	79%
57	3,264	19,655	0.1661	15.00%	18.00%	2,948	3,538	111%	92%
58	3,264	21,488	0.1519	15.00%	18.00%	3,223	3,868	101%	84%
59	3,409	22,340	0.1526	15.00%	18.00%	3,351	4,021	102%	85%
60	3,877	22,180	0.1748	23.00%	18.00%	5,101	3,992	76%	97%
61	5,102	22,499	0.2268	23.00%	33.00%	5,175	7,425	99%	69%
62	6,625	18,596	0.3563	33.00%	33.00%	6,137	6,137	108%	108%
63	3,982	13,169	0.3024	33.00%	33.00%	4,346	4,346	92%	92%
64	3,041	11,052	0.2752	33.00%	33.00%	3,647	3,647	83%	83%
65	6,873	23,649	0.2906	33.00%	33.00%	7,804	7,804	88%	88%
66	5,271	17,692	0.2979	33.00%	33.00%	5,838	5,838	90%	90%
67	3,708	11,610	0.3194	30.00%	30.00%	3,483	3,483	106%	106%
68	2,580	8,120	0.3177	30.00%	30.00%	2,436	2,436	106%	106%
69	1,733	6,206	0.2792	25.00%	30.00%	1,552	1,862	112%	93%
70	2,021	4,766	0.4240	20.00%	30.00%	953	1,430	212%	141%
71	999	3,091	0.3232	20.00%	30.00%	618	927	162%	108%
72	204	2,478	0.0823	20.00%	30.00%	496	743	41%	27%
73	353	2,422	0.1457	20.00%	30.00%	484	727	73%	49%
74	393	1,938	0.2028	20.00%	30.00%	388	582	101%	68%
Subtotal	$ 62,262	$ 269,830				$ 63,679	$ 69,511	98%	90%
75 or more	1,240	4,024	0.3082	100.00%	100.00%	4,024	4,024	31%	31%
Totals	$ 63,502	$ 273,854				$ 67,703	$ 73,535	94%	86%

*$ in thousands
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Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ -	$ 13,420	0.0000	1.00%	1.00%	$ 134	$ 134	0%	0%
50	245	15,792	0.0155	2.00%	2.00%	316	316	78%	78%
51	193	23,685	0.0081	2.00%	2.00%	474	474	41%	41%
52	305	29,909	0.0102	2.00%	2.00%	598	598	51%	51%
53	738	33,324	0.0221	2.00%	2.00%	667	667	111%	111%
54	567	34,202	0.0166	2.00%	2.00%	684	684	83%	83%
55	561	27,486	0.0204	2.00%	2.00%	550	550	102%	102%
56	240	23,615	0.0102	2.50%	2.50%	590	590	41%	41%
57	353	17,434	0.0202	3.00%	3.00%	523	523	67%	67%
58	680	13,233	0.0514	3.00%	3.00%	397	397	171%	171%
59	341	11,869	0.0287	3.00%	3.00%	356	356	96%	96%
60	1,072	17,908	0.0599	8.00%	8.00%	1,433	1,433	75%	75%
61	552	15,884	0.0348	8.00%	8.00%	1,271	1,271	43%	43%
62	2,326	23,439	0.0992	13.00%	13.00%	3,047	3,047	76%	76%
63	2,145	19,439	0.1103	13.00%	13.00%	2,527	2,527	85%	85%
64	2,107	17,073	0.1234	13.00%	13.00%	2,220	2,220	95%	95%
Totals	$ 12,425	$ 337,712				$ 15,786	$ 15,786	79%	79%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
FEMALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ -	$ 219	0.0000	30.00%	25.00%	$ 66	$ 55	0%	0%
50	68	669	0.1016	30.00%	25.00%	201	167	34%	41%
51	343	1,389	0.2469	30.00%	25.00%	417	347	82%	99%
52	1,560	7,209	0.2164	30.00%	25.00%	2,163	1,802	72%	87%
53	3,322	15,776	0.2106	14.00%	25.00%	2,209	3,944	150%	84%
54	2,144	21,443	0.1000	14.00%	18.00%	3,002	3,860	71%	56%
55	3,659	26,196	0.1397	14.00%	18.00%	3,667	4,715	100%	78%
56	4,456	30,362	0.1468	18.00%	18.00%	5,465	5,465	82%	82%
57	5,596	33,788	0.1656	18.00%	18.00%	6,082	6,082	92%	92%
58	5,890	32,649	0.1804	18.00%	22.00%	5,877	7,183	100%	82%
59	6,228	33,598	0.1854	18.00%	22.00%	6,048	7,392	103%	84%
60	8,153	31,150	0.2617	30.00%	30.00%	9,345	9,345	87%	87%
61	7,396	27,628	0.2677	30.00%	30.00%	8,288	8,288	89%	89%
62	9,279	26,123	0.3552	35.00%	35.00%	9,143	9,143	101%	101%
63	8,210	20,555	0.3994	35.00%	35.00%	7,194	7,194	114%	114%
64	4,932	15,409	0.3201	35.00%	35.00%	5,393	5,393	91%	91%
65	22,955	76,200	0.3012	35.00%	35.00%	26,670	26,670	86%	86%
66	19,827	53,344	0.3717	35.00%	35.00%	18,670	18,670	106%	106%
67	11,242	34,864	0.3225	35.00%	35.00%	12,202	12,202	92%	92%
68	7,876	24,368	0.3232	28.00%	35.00%	6,823	8,529	115%	92%
69	4,696	17,125	0.2742	28.00%	35.00%	4,795	5,994	98%	78%
70	5,025	12,481	0.4026	28.00%	35.00%	3,495	4,369	144%	115%
71	2,245	8,103	0.2771	28.00%	35.00%	2,269	2,836	99%	79%
72	1,659	5,586	0.2970	28.00%	35.00%	1,564	1,955	106%	85%
73	1,099	4,046	0.2716	28.00%	35.00%	1,133	1,416	97%	78%
74	734	2,798	0.2623	28.00%	35.00%	784	979	94%	75%
Subtotal	$ 148,594	$ 563,078				$ 152,964	$ 163,996	97%	91%
75 or more	1,604	5,225	0.3070	100.00%	100.00%	5,226	5,226	31%	31%
Totals	$ 150,198	$ 568,303				$ 158,190	$ 169,222	95%	89%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 307	$ 61,036	0.0050	2.00%	2.00%	$ 1,221	$ 1,221	25%	25%
50	230	37,482	0.0061	2.00%	2.00%	750	750	31%	31%
51	505	43,502	0.0116	2.00%	2.00%	870	870	58%	58%
52	297	43,572	0.0068	2.00%	2.00%	871	871	34%	34%
53	502	36,572	0.0137	2.00%	2.00%	731	731	69%	69%
54	316	31,081	0.0102	2.00%	2.00%	622	622	51%	51%
55	411	26,013	0.0158	3.00%	3.00%	780	780	53%	53%
56	865	23,953	0.0361	3.00%	3.00%	719	719	120%	120%
57	504	21,969	0.0229	6.00%	6.00%	1,318	1,318	38%	38%
58	535	22,907	0.0234	6.00%	6.00%	1,374	1,374	39%	39%
59	887	23,314	0.0380	6.00%	6.00%	1,399	1,399	63%	63%
60	4,938	52,764	0.0936	11.00%	11.00%	5,804	5,804	85%	85%
61	5,584	51,230	0.1090	11.00%	11.00%	5,635	5,635	99%	99%
62	11,321	87,606	0.1292	16.00%	16.00%	14,017	14,017	81%	81%
63	11,232	78,624	0.1429	16.00%	16.00%	12,580	12,580	89%	89%
64	10,902	68,469	0.1592	16.00%	16.00%	10,955	10,955	100%	100%
Totals	$ 49,336	$ 710,094				$ 59,646	$ 59,646	83%	83%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

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

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
60	$ 609	$ 4,262	0.1429	14.00%	14.00%	$ 597	$ 597	102%	102%
61	112	3,058	0.0366	12.00%	14.00%	428	428	26%	26%
62	228	2,674	0.0853	12.00%	14.00%	374	374	61%	61%
63	362	1,662	0.2178	12.00%	14.00%	233	233	156%	156%
64	394	1,627	0.2422	12.00%	14.00%	228	228	173%	173%
65	558	1,723	0.3239	25.00%	28.00%	482	482	116%	116%
66	287	1,029	0.2789	25.00%	28.00%	288	288	100%	100%
67	224	600	0.3733	25.00%	28.00%	168	168	133%	133%
68	111	262	0.4237	25.00%	28.00%	73	73	151%	151%
69	54	195	0.2769	25.00%	28.00%	55	55	99%	99%
Subtotal	$ 2,939	$ 17,092				$ 2,926	$ 2,926	100%	100%
70 or more	427	588	0.7262	100.00%	100.00%	588	588	73%	73%
Totals	$ 3,366	$ 17,680				$ 3,515	$ 3,515	96%	96%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

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

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	$ 53	$ 1,494	0.0355	15.00%	18.00%	$ 224	$ 269	24%	20%
41	1,168	4,853	0.2407	15.00%	18.00%	760	912	154%	128%
42	3,420	13,405	0.2551	15.00%	18.00%	2,113	2,536	162%	135%
43	3,365	20,472	0.1644	15.00%	18.00%	3,143	3,771	107%	89%
44	4,865	26,499	0.1836	15.00%	18.00%	4,369	5,243	111%	93%
45	6,100	30,676	0.1989	15.00%	18.00%	5,479	6,575	111%	93%
46	6,085	34,447	0.1766	15.00%	18.00%	6,037	7,245	101%	84%
47	6,286	37,599	0.1672	15.00%	18.00%	6,408	7,689	98%	82%
48	7,261	39,405	0.1843	15.00%	18.00%	6,489	7,787	112%	93%
49	4,483	35,450	0.1265	15.00%	15.00%	6,334	6,334	71%	71%
50	6,138	33,845	0.1814	15.00%	15.00%	6,141	6,141	100%	100%
51	6,437	29,678	0.2169	15.00%	15.00%	5,655	5,655	114%	114%
52	4,391	26,127	0.1681	15.00%	15.00%	4,502	4,502	98%	98%
53	3,487	23,914	0.1458	15.00%	15.00%	3,719	3,719	94%	94%
54	3,193	20,860	0.1531	15.00%	15.00%	3,113	3,113	103%	103%
55	2,797	17,643	0.1585	15.00%	15.00%	2,814	2,814	99%	99%
56	2,844	14,250	0.1996	15.00%	15.00%	2,361	2,361	120%	120%
57	1,498	12,711	0.1179	15.00%	15.00%	1,933	1,933	78%	78%
58	1,859	10,975	0.1694	15.00%	15.00%	1,803	1,803	103%	103%
59	1,220	8,706	0.1401	15.00%	15.00%	1,544	1,544	79%	79%
60	1,126	7,245	0.1554	20.00%	20.00%	1,686	1,686	67%	67%
61	1,472	6,786	0.2169	20.00%	20.00%	1,228	1,228	120%	120%
62	1,619	6,062	0.2671	30.00%	30.00%	1,602	1,602	101%	101%
63	1,341	4,871	0.2753	30.00%	30.00%	1,226	1,226	109%	109%
64	539	2,373	0.2271	30.00%	30.00%	869	869	62%	62%
65	482	2,151	0.2241	30.00%	30.00%	642	642	75%	75%
66	296	1,505	0.1967	30.00%	30.00%	483	483	61%	61%
67	423	910	0.4648	30.00%	30.00%	364	364	116%	116%
68	336	620	0.5419	30.00%	30.00%	237	237	142%	142%
69	72	388	0.1856	30.00%	30.00%	128	128	56%	56%
Subtotal	$ 84,656	$ 475,920				$ 83,406	$ 90,411	101%	94%
70 or more	153	608	0.2516	100.00%	100.00%	608	608	25%	25%
Totals	$ 84,809	$ 476,528				$ 84,014	$ 91,019	101%	93%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

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

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	$ -	$ -	N/A	15.00%	18.00%	$ -	$ -	0%	0%
46	0	0	N/A	15.00%	18.00%	0	0	0%	0%
47	0	0	N/A	15.00%	18.00%	0	0	0%	0%
48	0	72	0.0000	15.00%	18.00%	11	13	0%	0%
49	76	334	0.2275	15.00%	15.00%	50	50	152%	152%
50	0	544	0.0000	15.00%	15.00%	82	82	0%	0%
51	133	1,520	0.0875	15.00%	15.00%	228	228	58%	58%
52	588	4,086	0.1439	15.00%	15.00%	613	613	96%	96%
53	1,179	6,470	0.1822	15.00%	18.00%	971	1165	121%	101%
54	1,474	7,182	0.2052	15.00%	18.00%	1077	1293	137%	114%
55	1,190	7,496	0.1588	15.00%	18.00%	1124	1349	106%	88%
56	593	7,627	0.0778	15.00%	18.00%	1144	1373	52%	43%
57	1,455	7,003	0.2078	15.00%	18.00%	1051	1261	139%	115%
58	2,299	7,207	0.3190	15.00%	18.00%	1081	1297	213%	177%
59	798	5,514	0.1447	20.00%	18.00%	1103	993	72%	80%
60	1,246	6,945	0.1794	20.00%	20.00%	1389	1389	90%	90%
61	1,134	7,126	0.1591	20.00%	20.00%	1425	1425	80%	80%
62	1,757	6,052	0.2903	30.00%	30.00%	1816	1816	97%	97%
63	808	4,268	0.1893	30.00%	30.00%	1280	1280	63%	63%
64	973	4,412	0.2205	30.00%	30.00%	1324	1324	74%	74%
65	1,292	3,401	0.3799	30.00%	30.00%	1020	1020	127%	127%
66	431	2,567	0.1679	40.00%	40.00%	1027	1027	42%	42%
67	1,023	1,922	0.5323	50.00%	50.00%	961	961	106%	106%
68	147	695	0.2115	50.00%	50.00%	348	348	42%	42%
69	234	381	0.6142	50.00%	50.00%	191	191	123%	123%
Subtotal	$ 18,830	$ 92,824				$ 19,314	$ 20,496	97%	92%
70 or more	286	861	0.3322	100.00%	100.00%	861	861	33%	33%
Totals	$ 19,116	$ 93,685				$ 20,175	$ 21,357	95%	90%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE < 30
FIREFIGHTERS - MALES AND FEMALES COMBINED
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	$ -	$ 1,496	0.0000	7.50%	7.50%	$ 112	$ 112	0%	0%
41	95	2,436	0.0390	7.50%	7.50%	183	183	52%	52%
42	335	3,303	0.1014	7.50%	7.50%	248	248	135%	135%
43	886	6,351	0.1395	7.50%	7.50%	476	476	186%	186%
44	736	7,853	0.0937	7.50%	7.50%	589	589	125%	125%
45	438	10,603	0.0413	7.50%	7.50%	795	795	55%	55%
46	1,137	11,828	0.0961	7.50%	7.50%	887	887	128%	128%
47	1,104	14,063	0.0785	7.50%	7.50%	1,055	1,055	105%	105%
48	432	15,517	0.0278	7.50%	7.50%	1,164	1,164	37%	37%
49	1,948	16,843	0.1157	7.50%	7.50%	1,263	1,263	154%	154%
50	744	15,399	0.0483	7.50%	7.50%	1,155	1,155	64%	64%
51	1,210	14,357	0.0843	7.50%	7.50%	1,077	1,077	112%	112%
52	495	12,060	0.0410	7.50%	7.50%	904	904	55%	55%
53	1,703	11,511	0.1479	7.50%	7.50%	863	863	197%	197%
54	813	9,552	0.0851	7.50%	7.50%	716	716	114%	114%
55	221	8,711	0.0254	7.50%	7.50%	653	653	34%	34%
56	336	7,573	0.0444	7.50%	7.50%	568	568	59%	59%
57	555	7,154	0.0776	15.00%	15.00%	1,073	1,073	52%	52%
58	767	5,812	0.1320	15.00%	15.00%	872	872	88%	88%
59	227	4,389	0.0517	15.00%	15.00%	658	658	34%	34%
60	465	3,966	0.1172	15.00%	15.00%	595	595	78%	78%
61	463	3,641	0.1272	15.00%	15.00%	546	546	85%	85%
62	470	2,522	0.1864	25.00%	25.00%	630	630	75%	75%
63	142	2,023	0.0702	25.00%	25.00%	506	506	28%	28%
64	778	2,049	0.3797	25.00%	25.00%	512	512	152%	152%
65	146	1,295	0.1127	50.00%	50.00%	648	648	23%	23%
66	342	884	0.3869	50.00%	50.00%	442	442	77%	77%
67	280	519	0.5395	50.00%	50.00%	260	260	108%	108%
68	86	161	0.5342	50.00%	50.00%	81	81	106%	106%
69	0	77	0.0000	50.00%	50.00%	38	38	0%	0%
Subtotal	$ 17,354	$ 203,948				$ 19,569	$ 19,569	89%	89%
70 or more	0	78	0.0000	100.00%	100.00%	78	78	0%	0%
Total	$ 17,354	$ 204,026				$ 19,647	$ 19,647	88%	88%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE ≥ 30
FIREFIGHTERS - MALES AND FEMALES COMBINED
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	$ -	$ -	N/A	15.00%	12.00%	$ -	$ -	0%	0%
46	0	0	N/A	15.00%	12.00%	0	0	0%	0%
47	0	0	N/A	15.00%	12.00%	0	0	0%	0%
48	0	0	N/A	15.00%	12.00%	0	0	0%	0%
49	0	60	0.0000	15.00%	12.00%	9	7	0%	0%
50	0	263	0.0000	15.00%	12.00%	39	32	0%	0%
51	140	518	0.2703	15.00%	12.00%	78	62	179%	226%
52	124	929	0.1335	15.00%	12.00%	139	111	89%	112%
53	209	1,032	0.2025	15.00%	12.00%	155	124	135%	169%
54	0	1,252	0.0000	15.00%	12.00%	188	150	0%	0%
55	275	1,663	0.1654	15.00%	12.00%	249	200	110%	138%
56	300	1,919	0.1563	15.00%	12.00%	288	230	104%	130%
57	165	2,286	0.0722	15.00%	12.00%	343	274	48%	60%
58	396	2,007	0.1973	20.00%	15.00%	401	301	99%	132%
59	366	2,328	0.1572	20.00%	15.00%	466	349	79%	105%
60	279	2,551	0.1094	20.00%	15.00%	510	383	55%	73%
61	449	2,723	0.1649	20.00%	15.00%	545	408	82%	110%
62	897	2,478	0.3620	25.00%	20.00%	619	496	145%	181%
63	155	1,719	0.0902	25.00%	20.00%	430	344	36%	45%
64	249	1,487	0.1675	25.00%	25.00%	372	372	67%	67%
65	170	928	0.1832	50.00%	40.00%	464	371	37%	46%
66	261	799	0.3267	50.00%	40.00%	400	320	65%	82%
67	458	707	0.6478	50.00%	50.00%	353	353	130%	130%
68	169	254	0.6654	50.00%	50.00%	127	127	133%	133%
69	0	240	0.0000	50.00%	50.00%	120	120	0%	0%
Subtotal	$ 5,062	$ 28,143				$ 6,295	$ 5,134	80%	99%
70 or more	176	707	0.2489	100.00%	100.00%	707	707	25%	25%
Total	$ 5,238	$ 28,850				$ 7,002	$ 5,841	75%	90%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE < 25
JUDGES - MALES AND FEMALES COMBINED
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
62	$ 178	$ 2,252	0.0790	15.00%	15.00%	$ 338	$ 338	53%	53%
63	354	1,912	0.1851	15.00%	15.00%	287	287	123%	123%
64	171	2,058	0.0831	15.00%	15.00%	309	309	55%	55%
65	161	1,707	0.0943	15.00%	15.00%	256	256	63%	63%
66	169	1,862	0.0908	15.00%	15.00%	279	279	61%	61%
67	0	1,545	0.0000	15.00%	15.00%	232	232	0%	0%
68	0	1,218	0.0000	15.00%	15.00%	183	183	0%	0%
69	349	1,033	0.3379	15.00%	15.00%	155	155	225%	225%
Subtotal	$ 1,382	$ 13,587				$ 2,039	$ 2,039	68%	68%
70 or more	676	2,037	0.3319	100.00%	100.00%	2,037	2,037	33%	33%
Total	$ 2,058	$ 15,624				$ 4,076	$ 4,076	50%	50%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

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

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	$ -	$ -	N/A	10.00%	10.00%	$ -	$ -	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	176	0.0000	10.00%	10.00%	18	18	0%	0%
50	0	0	N/A	10.00%	10.00%	0	0	0%	0%
51	0	332	0.0000	10.00%	10.00%	33	33	0%	0%
52	0	501	0.0000	10.00%	10.00%	50	50	0%	0%
53	0	515	0.0000	10.00%	10.00%	52	52	0%	0%
54	0	846	0.0000	10.00%	10.00%	85	85	0%	0%
55	0	1,025	0.0000	10.00%	10.00%	103	103	0%	0%
56	0	859	0.0000	10.00%	10.00%	86	86	0%	0%
57	0	349	0.0000	10.00%	10.00%	35	35	0%	0%
58	0	173	0.0000	10.00%	10.00%	17	17	0%	0%
59	0	337	0.0000	10.00%	10.00%	34	34	0%	0%
60	0	171	0.0000	10.00%	10.00%	17	17	0%	0%
61	172	675	0.2548	10.00%	10.00%	68	68	253%	253%
62	349	516	0.6764	10.00%	10.00%	52	52	671%	671%
63	161	161	1.0000	10.00%	10.00%	16	16	1006%	1006%
64	0	0	N/A	20.00%	20.00%	0	0	0%	0%
65	161	357	0.4510	20.00%	20.00%	71	71	227%	227%
66	0	173	0.0000	25.00%	25.00%	43	43	0%	0%
67	165	341	0.4839	25.00%	25.00%	85	85	194%	194%
68	0	176	0.0000	25.00%	25.00%	44	44	0%	0%
69	0	0	N/A	25.00%	25.00%	0	0	0%	0%
Subtotal	$ 1,008	$ 7,683				$ 909	$ 909	111%	111%
70 or more	0	0	N/A	100.00%	100.00%	0	0	0%	0%
Total	$ 1,008	$ 7,683				$ 909	$ 909	111%	111%

*$ in thousands

*Column may not add due to rounding.

Summary of Data and Experience

RETIREMENT EXPERIENCE SERVICE ≥ 30
JUDGES - MALES AND FEMALES COMBINED
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Exposures	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
45	$ -	$ -	N/A	10.00%	10.00%	$ -	$ -	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	161	0.0000	10.00%	10.00%	16	16	0%	0%
56	0	504	0.0000	10.00%	10.00%	50	50	0%	0%
57	0	685	0.0000	10.00%	10.00%	68	68	0%	0%
58	173	694	0.2493	10.00%	10.00%	69	69	251%	251%
59	0	349	0.0000	10.00%	10.00%	35	35	0%	0%
60	161	664	0.2425	10.00%	10.00%	66	66	244%	244%
61	0	338	0.0000	10.00%	10.00%	34	34	0%	0%
62	171	344	0.4971	10.00%	10.00%	34	34	503%	503%
63	176	508	0.3465	10.00%	10.00%	51	51	345%	345%
64	338	659	0.5129	20.00%	20.00%	132	132	256%	256%
65	316	820	0.3854	20.00%	20.00%	164	164	193%	193%
66	0	520	0.0000	25.00%	25.00%	130	130	0%	0%
67	332	848	0.3915	25.00%	25.00%	212	212	157%	157%
68	328	687	0.4774	25.00%	25.00%	172	172	191%	191%
69	0	186	0.0000	25.00%	25.00%	46	46	0%	0%
Subtotal	$ 1,995	$ 7,967				$ 1,279	$ 1,279	156%	156%
70 or more	501	501	1.0000	100.00%	100.00%	1,499	1,499	33%	33%
Total	$ 2,496	$ 8,468				$ 2,778	$ 2,778	90%	90%

*$ in thousands
*Column may not add due to rounding.

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
STATE EMPLOYEES

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	7.33%	8.25%	8.50%
1	7.21%	7.50%	7.75%
2	6.55%	6.50%	7.00%
3	6.36%	6.00%	6.25%
4	5.88%	5.75%	6.00%
5	5.56%	5.25%	5.50%
6	5.48%	5.00%	5.50%
7	5.39%	4.75%	5.25%
8	5.10%	4.75%	5.00%
9	5.18%	4.50%	5.00%
10	4.80%	4.50%	4.75%
11	4.80%	4.25%	4.75%
12	4.76%	4.25%	4.75%
13	4.49%	4.25%	4.50%
14	4.37%	4.00%	4.25%
15	4.38%	3.75%	4.25%
16	4.21%	3.75%	4.25%
17	4.38%	3.75%	4.25%
18	4.17%	3.75%	4.00%
19	4.06%	3.75%	4.00%
20	4.12%	3.50%	4.00%
21	3.94%	3.50%	3.75%
22	3.95%	3.50%	3.75%
23	3.92%	3.50%	3.75%
24	3.68%	3.25%	3.50%
25 and up	3.46%	3.25%	3.50%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
LOCAL GOVERNMENT

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	7.83%	8.25%	8.50%
1	7.45%	7.00%	7.25%
2	7.10%	6.50%	7.00%
3	6.66%	6.00%	6.50%
4	6.48%	5.50%	6.25%
5	5.94%	5.25%	6.00%
6	5.92%	5.00%	5.75%
7	5.55%	4.75%	5.50%
8	5.66%	4.50%	5.25%
9	5.26%	4.50%	5.00%
10	5.10%	4.25%	4.75%
11	4.89%	4.00%	4.75%
12	4.80%	4.00%	4.75%
13	4.84%	4.00%	4.50%
14	4.64%	4.00%	4.50%
15	4.75%	4.00%	4.50%
16	4.30%	3.75%	4.25%
17	4.40%	3.75%	4.25%
18	4.36%	3.75%	4.25%
19	4.12%	3.50%	4.00%
20	4.10%	3.50%	4.00%
21	4.12%	3.50%	4.00%
22	4.06%	3.50%	3.75%
23	3.98%	3.25%	3.50%
24	3.95%	3.25%	3.50%
25 and up	3.72%	3.25%	3.50%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
EDUCATORS

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	8.41%	9.25%	9.50%
1	7.98%	8.50%	8.75%
2	7.71%	7.50%	7.75%
3	7.57%	7.25%	7.50%
4	7.63%	7.00%	7.25%
5	7.43%	6.75%	7.25%
6	7.05%	6.75%	7.00%
7	7.29%	6.50%	7.00%
8	6.98%	6.50%	6.75%
9	6.45%	6.25%	6.50%
10	6.21%	5.75%	6.00%
11	5.75%	5.50%	5.75%
12	5.71%	5.25%	5.50%
13	5.34%	4.75%	5.00%
14	4.94%	4.50%	4.75%
15	4.85%	4.25%	4.50%
16	4.67%	4.00%	4.50%
17	4.75%	3.75%	4.50%
18	4.45%	3.75%	4.25%
19	4.57%	3.75%	4.25%
20	4.45%	3.75%	4.25%
21	4.40%	3.75%	4.00%
22	4.30%	3.75%	4.00%
23	4.34%	3.50%	4.00%
24	4.24%	3.50%	3.75%
25 and up	3.88%	3.25%	3.50%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
PUBLIC SAFETY

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	6.24%	6.75%	7.25%
1	6.33%	6.00%	7.00%
2	6.37%	6.00%	6.75%
3	6.36%	6.00%	6.75%
4	6.54%	6.00%	6.50%
5	6.49%	6.00%	6.50%
6	6.54%	5.75%	6.25%
7	5.68%	5.50%	6.25%
8	5.82%	5.25%	6.00%
9	5.77%	5.25%	6.00%
10	5.44%	5.00%	6.00%
11	5.12%	4.75%	5.75%
12	4.79%	4.50%	5.75%
13	4.77%	4.50%	5.50%
14	4.81%	4.50%	5.25%
15	4.64%	4.50%	5.25%
16	4.22%	4.25%	5.00%
17	4.10%	4.00%	5.00%
18	4.19%	4.00%	4.75%
19	4.28%	4.00%	4.75%
20	3.93%	4.00%	4.75%
21	3.98%	3.75%	4.50%
22	3.68%	3.75%	4.25%
23	3.59%	3.50%	4.25%
24	3.85%	3.50%	4.00%
25 and up	3.50%	3.25%	3.75%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
FIREFIGHTERS

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	7.49%	8.50%	8.25%
1	7.50%	8.00%	8.00%
2	7.25%	7.75%	7.75%
3	6.94%	7.50%	7.75%
4	7.80%	7.50%	7.50%
5	7.78%	7.25%	7.50%
6	7.66%	7.25%	7.25%
7	6.89%	6.75%	7.00%
8	6.43%	6.50%	6.75%
9	6.45%	6.00%	6.50%
10	6.03%	5.50%	6.00%
11	5.48%	5.00%	5.50%
12	4.82%	4.75%	5.25%
13	4.75%	4.50%	5.00%
14	4.85%	4.25%	4.75%
15	4.35%	4.25%	4.50%
16	4.18%	4.25%	4.50%
17	3.88%	4.00%	4.25%
18	4.39%	3.75%	4.00%
19	4.09%	3.75%	4.00%
20	3.58%	3.75%	4.00%
21	3.61%	3.50%	3.75%
22	3.82%	3.50%	3.75%
23	3.48%	3.50%	3.75%
24	3.50%	3.25%	3.50%
25 and up	2.89%	3.25%	3.50%

APPENDIX A

SUMMARY OF PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Proposed Actuarial Assumptions and Methods

1. *Investment return rate*:

   6.85% per annum, compounded annually, composed of a 2.50% inflation rate and a 4.45% net real rate of return.

2. *Active member mortality rates*:

   The mortality assumption for active members is the PUB-2010 Employees Mortality Table for public employees, teachers, and public safety members, respectively. Rates at selected ages are shown:

	Active Male Members		
Age	Public Educators	All Public Employees Except Educators	Public Safety and Firefighters
20	0.000340	0.000370	0.000410
25	0.000160	0.000280	0.000370
30	0.000220	0.000360	0.000410
35	0.000300	0.000470	0.000470
40	0.000420	0.000660	0.000590
45	0.000670	0.000980	0.000820
50	0.001110	0.001490	0.001200
55	0.001720	0.002190	0.001750
60	0.002640	0.003190	0.002640

	Active Female Members		
Age	Public Educators	All Public Employees Except Educators	Public Safety and Firefighters
20	0.000130	0.000130	0.000160
25	0.000090	0.000090	0.000200
30	0.000140	0.000150	0.000270
35	0.000200	0.000230	0.000360
40	0.000310	0.000360	0.000490
45	0.000480	0.000560	0.000670
50	0.000730	0.000830	0.000910
55	0.001070	0.001230	0.001230
60	0.001610	0.001860	0.001680

3. *Disability rates*:

Disability rates are a function of the member's sex, occupation, and age. These rates were developed based on plan experience. 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	0.000100	0.000100	0.000060	0.000150	0.000360
25	0.000150	0.000150	0.000090	0.000225	0.000540
30	0.000300	0.000300	0.000180	0.000450	0.001080
35	0.000450	0.000450	0.000270	0.000675	0.001620
40	0.000600	0.000600	0.000360	0.000900	0.002160
45	0.001000	0.001000	0.000600	0.001500	0.003600
50	0.001300	0.001300	0.000780	0.001950	0.004680
55	0.002050	0.002050	0.001230	0.003075	0.007380
60	0.002800	0.002800	0.001680	0.004200	0.010080

	Active Female Members				
Age	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
20	0.000080	0.000100	0.000060	0.000150	0.000360
25	0.000120	0.000150	0.000090	0.000225	0.000540
30	0.000240	0.000300	0.000180	0.000450	0.001080
35	0.000360	0.000450	0.000270	0.000675	0.001620
40	0.000480	0.000600	0.000360	0.000900	0.002160
45	0.000800	0.001000	0.000600	0.001500	0.003600
50	0.001040	0.001300	0.000780	0.001950	0.004680
55	0.001640	0.002050	0.001230	0.003075	0.007380
60	0.002240	0.002800	0.001680	0.004200	0.010080

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	0.1900	0.2700	0.1600	0.1500	0.0700
1	0.1300	0.2000	0.1200	0.0800	0.0550
2	0.1000	0.1200	0.0850	0.0700	0.0400
3	0.0900	0.1000	0.0700	0.0600	0.0375
4	0.0800	0.0900	0.0650	0.0550	0.0300
5	0.0700	0.0800	0.0600	0.0500	0.0250
6	0.0650	0.0700	0.0550	0.0450	0.0225
7	0.0550	0.0600	0.0450	0.0400	0.0200
8	0.0500	0.0500	0.0400	0.0350	0.0175
9	0.0450	0.0500	0.0350	0.0300	0.0175
10	0.0400	0.0450	0.0300	0.0250	0.0175
11	0.0350	0.0450	0.0275	0.0250	0.0150
12	0.0325	0.0400	0.0250	0.0250	0.0125
13	0.0300	0.0375	0.0200	0.0200	0.0125
14	0.0300	0.0350	0.0175	0.0200	0.0010
15	0.0275	0.0300	0.0175	0.0200	0.0010
16	0.0275	0.0275	0.0150	0.0150	0.0010
17	0.0250	0.0250	0.0150	0.0150	0.0010
18	0.0250	0.0200	0.0150	0.0150	0.0010
19	0.0250	0.0200	0.0150	0.0150	0.0010
20	0.0200	0.0200	0.0150	0.0100	0.0010
21	0.0200	0.0200	0.0150	0.0100	0.0010
22	0.0175	0.0200	0.0150	0.0100	0.0010
23	0.0150	0.0150	0.0150	0.0100	0.0010
24	0.0125	0.0150	0.0150	0.0100	0.0010
25+	0.0100	0.0100	0.0100	N/A	N/A

4. *Termination rates (continued)*:

	Active Female Members				
	Years of Service				
Service	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
0	0.2600	0.2800	0.1600	0.1500	0.0700
1	0.1800	0.2100	0.1300	0.0800	0.0550
2	0.1500	0.1500	0.1000	0.0700	0.0400
3	0.1300	0.1300	0.0900	0.0600	0.0375
4	0.1150	0.1100	0.0800	0.0550	0.0300
5	0.0950	0.1000	0.0700	0.0500	0.0250
6	0.0900	0.0850	0.0600	0.0450	0.0225
7	0.0800	0.0725	0.0525	0.0400	0.0200
8	0.0700	0.0625	0.0450	0.0350	0.0175
9	0.0600	0.0575	0.0400	0.0300	0.0175
10	0.0550	0.0525	0.0375	0.0250	0.0175
11	0.0500	0.0450	0.0325	0.0250	0.0150
12	0.0475	0.0425	0.0300	0.0250	0.0125
13	0.0450	0.0400	0.0250	0.0200	0.0125
14	0.0400	0.0375	0.0200	0.0200	0.0010
15	0.0400	0.0350	0.0200	0.0200	0.0010
16	0.0375	0.0300	0.0175	0.0150	0.0010
17	0.0350	0.0275	0.0175	0.0150	0.0010
18	0.0300	0.0275	0.0175	0.0150	0.0010
19	0.0300	0.0275	0.0150	0.0150	0.0010
20	0.0250	0.0275	0.0150	0.0100	0.0010
21	0.0250	0.0250	0.0150	0.0100	0.0010
22	0.0225	0.0225	0.0150	0.0100	0.0010
23	0.0200	0.0200	0.0150	0.0100	0.0010
24	0.0200	0.0200	0.0150	0.0100	0.0010
25+	0.0100	0.0100	0.0100	N/A	N/A

5. *Refund rates*:

The refund rates for Tier 1 members 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 Tier 1 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.

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	0%	0%	0%	0%

[1] Male and female members combined.

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	0%	0%	0%

Members in the Tier 2 Hybrid Systems (public employee and public safety and firefighter system) are assumed to elect a refund at their termination of employment if the value of their employee contribution balance (with interest) is greater than the value of their pension benefit.

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	0.120	0.040	0.200
54	0.025	0.120	0.040	0.150
55	0.030	0.120	0.040	0.150
56	0.030	0.120	0.040	0.150
57	0.030	0.120	0.040	0.150
58	0.040	0.120	0.060	0.150
59	0.040	0.150	0.060	0.200
60	0.040	0.150	0.100	0.200
61	0.040	0.150	0.130	0.200
62	0.100	0.250	0.130	0.300
63	0.100	0.250	0.130	0.300
64	0.100	0.250	0.130	0.300
65	N/A	0.250	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	0.300
69	N/A	0.300	N/A	0.300
70	N/A	0.300	N/A	0.300
71	N/A	0.300	N/A	0.300
72	N/A	0.300	N/A	0.300
73	N/A	0.300	N/A	0.250
74	N/A	0.300	N/A	0.250
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	0.120
51	N/A	0.150	N/A	0.120
52	N/A	0.150	N/A	0.120
53	N/A	0.150	N/A	0.120
54	N/A	0.150	N/A	0.120
55	N/A	0.150	N/A	0.150
56	N/A	0.150	N/A	0.150
57	N/A	0.150	N/A	0.150
58	N/A	0.150	N/A	0.150
59	N/A	0.150	N/A	0.200
60	0.020	0.200	0.020	0.200
61	0.040	0.200	0.040	0.200
62	0.060	0.230	0.060	0.280
63	0.080	0.230	0.080	0.280
64	0.100	0.230	0.100	0.280
65	N/A	0.230	N/A	0.280
66	N/A	0.230	N/A	0.280
67	N/A	0.220	N/A	0.280
68	N/A	0.220	N/A	0.280
69	N/A	0.220	N/A	0.280
70	N/A	0.220	N/A	0.300
71	N/A	0.220	N/A	0.300
72	N/A	0.220	N/A	0.300
73	N/A	0.220	N/A	0.250
74	N/A	0.220	N/A	0.250
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	0.020	0.170
51	0.023	0.150	0.020	0.160
52	0.025	0.150	0.020	0.160
53	0.025	0.150	0.020	0.160
54	0.025	0.150	0.020	0.160
55	0.025	0.160	0.040	0.160
56	0.025	0.160	0.040	0.160
57	0.025	0.160	0.040	0.160
58	0.025	0.160	0.040	0.200
59	0.040	0.160	0.040	0.200
60	0.050	0.200	0.090	0.250
61	0.050	0.200	0.090	0.250
62	0.110	0.300	0.140	0.330
63	0.110	0.300	0.140	0.330
64	0.110	0.300	0.140	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	0.250
61	0.040	0.200	0.040	0.250
62	0.060	0.300	0.060	0.330
63	0.080	0.300	0.080	0.330
64	0.100	0.300	0.100	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

[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	0.250
51	0.020	0.200	0.020	0.250
52	0.020	0.200	0.020	0.250
53	0.020	0.200	0.020	0.250
54	0.020	0.180	0.020	0.180
55	0.020	0.180	0.030	0.180
56	0.025	0.180	0.030	0.180
57	0.030	0.180	0.060	0.180
58	0.030	0.180	0.060	0.220
59	0.030	0.180	0.060	0.220
60	0.080	0.180	0.110	0.300
61	0.080	0.330	0.110	0.300
62	0.130	0.330	0.160	0.350
63	0.130	0.330	0.160	0.350
64	0.130	0.330	0.160	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	0.350
69	N/A	0.300	N/A	0.350
70	N/A	0.300	N/A	0.350
71	N/A	0.300	N/A	0.350
72	N/A	0.300	N/A	0.350
73	N/A	0.300	N/A	0.350
74	N/A	0.300	N/A	0.350
75+	N/A	1.000	N/A	1.000

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	0.150	N/A	0.140
55	N/A	0.150	N/A	0.140
56	N/A	0.150	N/A	0.180
57	N/A	0.150	N/A	0.180
58	N/A	0.150	N/A	0.180
59	N/A	0.150	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	0.330	0.060	0.350
63	0.080	0.330	0.080	0.350
64	0.100	0.330	0.100	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	0.280
69	N/A	0.250	N/A	0.280
70	N/A	0.200	N/A	0.280
71	N/A	0.200	N/A	0.280
72	N/A	0.200	N/A	0.280
73	N/A	0.200	N/A	0.280
74	N/A	0.200	N/A	0.280
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	0.180	0.180	0.075	0.120
45	0.000	0.180	0.180	0.075	0.120
46	0.000	0.180	0.180	0.075	0.120
47	0.000	0.180	0.180	0.075	0.120
48	0.000	0.180	0.180	0.075	0.120
49	0.000	0.150	0.150	0.075	0.120
50	0.000	0.150	0.150	0.075	0.120
51	0.000	0.150	0.150	0.075	0.120
52	0.000	0.150	0.150	0.075	0.120
53	0.000	0.150	0.180	0.075	0.120
54	0.000	0.150	0.180	0.075	0.120
55	0.000	0.150	0.180	0.075	0.120
56	0.000	0.150	0.180	0.075	0.120
57	0.000	0.150	0.180	0.150	0.120
58	0.000	0.150	0.180	0.150	0.150
59	0.000	0.150	0.180	0.150	0.150
60	0.140	0.200	0.200	0.150	0.150
61	0.140	0.200	0.200	0.150	0.150
62	0.140	0.300	0.300	0.250	0.200
63	0.140	0.300	0.300	0.250	0.200
64	0.140	0.300	0.300	0.250	0.250
65	0.280	0.300	0.300	0.500	0.400
66	0.280	0.300	0.400	0.500	0.400
67	0.280	0.300	0.500	0.500	0.500
68	0.280	0.300	0.500	0.500	0.500
69	0.280	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 – 25	25 – 29[1]	30+[1]	0 – 25	25 - 29[1]	30+[1]
40-44	N/A	0.180	N/A	N/A	0.075	N/A
45	N/A	0.180	0.180	N/A	0.075	0.120
46	N/A	0.180	0.180	N/A	0.075	0.120
47	N/A	0.180	0.180	N/A	0.075	0.120
48	N/A	0.180	0.180	N/A	0.075	0.120
49	N/A	0.150	0.150	N/A	0.075	0.120
50	N/A	0.150	0.150	N/A	0.075	0.120
51	N/A	0.150	0.150	N/A	0.075	0.120
52	N/A	0.150	0.150	N/A	0.075	0.120
53	N/A	0.150	0.180	N/A	0.075	0.120
54	N/A	0.150	0.180	N/A	0.075	0.120
55	N/A	0.150	0.180	N/A	0.075	0.120
56	N/A	0.150	0.180	N/A	0.075	0.120
57	N/A	0.150	0.180	N/A	0.150	0.120
58	N/A	0.150	0.180	N/A	0.150	0.150
59	N/A	0.150	0.180	N/A	0.150	0.150
60	0.050	0.200	0.200	0.050	0.150	0.150
61	0.050	0.200	0.200	0.050	0.150	0.150
62	0.050	0.300	0.300	0.050	0.250	0.200
63	0.100	0.300	0.300	0.100	0.250	0.200
64	0.100	0.300	0.300	0.100	0.250	0.250
65	0.300	0.300	0.300	0.500	0.500	0.400
66	0.300	0.300	0.400	0.500	0.500	0.400
67	0.300	0.300	0.500	0.500	0.500	0.500
68	0.300	0.300	0.500	0.500	0.500	0.500
69	0.300	0.300	0.500	0.500	0.500	0.500
70+	1.000	1.000	1.000	1.000	1.000	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 10%.

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	0.150	0.100	0.100
63	0.150	0.100	0.100
64	0.150	0.200	0.200
65	0.150	0.200	0.200
66	0.150	0.250	0.250
67	0.150	0.250	0.250
68	0.150	0.250	0.250
69	0.150	0.250	0.250
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	5.00%	8.50%
1	3.75	7.25
2	3.50	7.00
3	3.00	6.50
4	2.75	6.25
5	2.50	6.00
6	2.25	5.75
7	2.00	5.50
8	1.75	5.25
9	1.50	5.00
10	1.25	4.75
11	1.25	4.75
12	1.25	4.75
13	1.00	4.50
14	1.00	4.50
15	1.00	4.50
16	0.75	4.25
17	0.75	4.25
18	0.75	4.25
19	0.50	4.00
20	0.50	4.00
21	0.50	4.00
22	0.25	3.75
23	0.00	3.50
24	0.00	3.50
25 or more	0.00	3.50

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	5.00%	8.50%
1	4.25	7.75
2	3.50	7.00
3	2.75	6.25
4	2.50	6.00
5	2.00	5.50
6	2.00	5.50
7	1.75	5.25
8	1.50	5.00
9	1.50	5.00
10	1.25	4.75
11	1.25	4.75
12	1.25	4.75
13	1.00	4.50
14	0.75	4.25
15	0.75	4.25
16	0.75	4.25
17	0.75	4.25
18	0.50	4.00
19	0.50	4.00
20	0.50	4.00
21	0.25	3.75
22	0.25	3.75
23	0.25	3.75
24	0.00	3.50
25 or more	0.00	3.50

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	6.00%	9.50%
1	5.25	8.75
2	4.25	7.75
3	4.00	7.50
4	3.75	7.25
5	3.75	7.25
6	3.50	7.00
7	3.50	7.00
8	3.25	6.75
9	3.00	6.50
10	2.50	6.00
11	2.25	5.75
12	2.00	5.50
13	1.50	5.00
14	1.25	4.75
15	1.00	4.50
16	1.00	4.50
17	1.00	4.50
18	0.75	4.25
19	0.75	4.25
20	0.75	4.25
21	0.50	4.00
22	0.50	4.00
23	0.50	4.00
24	0.25	3.75
25 or more	0.00	3.50

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 3.75% Wage Inflation**
0	3.50%	7.25%
1	3.25	7.00
2	3.00	6.75
3	3.00	6.75
4	2.75	6.50
5	2.75	6.50
6	2.50	6.25
7	2.50	6.25
8	2.25	6.00
9	2.25	6.00
10	2.25	6.00
11	2.00	5.75
12	2.00	5.75
13	1.75	5.50
14	1.50	5.25
15	1.50	5.25
16	1.25	5.00
17	1.25	5.00
18	1.00	4.75
19	1.00	4.75
20	1.00	4.75
21	0.75	4.50
22	0.50	4.25
23	0.50	4.25
24	0.25	4.00
25+	0.00	3.75

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	4.75%	8.25%
1	4.50	8.00
2	4.25	7.75
3	4.25	7.75
4	4.00	7.50
5	4.00	7.50
6	3.75	7.25
7	3.50	7.00
8	3.25	6.75
9	3.00	6.50
10	2.50	6.00
11	2.00	5.50
12	1.75	5.25
13	1.50	5.00
14	1.25	4.75
15	1.00	4.50
16	1.00	4.50
17	0.75	4.25
18	0.50	4.00
19	0.50	4.00
20	0.50	4.00
21	0.25	3.75
22	0.25	3.75
23	0.25	3.75
24	0.00	3.50
25 or more	0.00	3.50

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

All non-educator groups except judges:
Male retirees: 110% of 2020 PR UTAH Retiree Mortality Table for males, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2020.
Female retirees: 110% of 2020 PR UTAH Retiree Mortality Table for females, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2020.
Educators and judges:
Male retirees: 90% of 2020 PR UTAH Retiree Mortality Table for males, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2020.
Female retirees: 90% of 2020 PR UTAH Retiree Mortality Table for females, projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2020.

Mortality Rates in Base Tables before Projection (Multipliers Applied)				
	Non-educators except judges		Educators and judges	
Age	Males	Females	Males	Females
50	0.003025	0.002254	0.002475	0.001844
55	0.004355	0.004018	0.003563	0.003288
60	0.007073	0.006557	0.005787	0.005365
65	0.008903	0.007696	0.007285	0.006296
70	0.013176	0.009556	0.010780	0.007818
75	0.022862	0.017380	0.018706	0.014220
80	0.046980	0.035345	0.038438	0.028919
85	0.086607	0.067895	0.070861	0.055551
90	0.147313	0.147706	0.120529	0.120850

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	2025	2030	2035	2040	2045
Noneducators - Male	21.5	21.8	22.1	22.5	22.8
Noneducators - Female	23.0	23.4	23.7	24.0	24.3
Educators/Judges - Male	23.0	23.3	23.6	24.0	24.3
Educators/Judges - Female	24.6	24.9	25.2	25.5	25.8

9. *Disabled annuitant mortality rates*:

Males: 120% of the PUB-2010 for Disabled Males (General Employees), projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2010.
Females: 125% of the PUB-2010 for Disabled Females (General Employees), projected with the ultimate rates from the MP-2020 mortality improvement scale using a base year of 2010.

Disabled Mortality Rates in Base Table before Projections (Multipliers Applied)		
Age	**Males**	**Females**
20	0.004944	0.002913
25	0.003336	0.002050
30	0.004248	0.003213
35	0.005496	0.005013
40	0.007740	0.007863
45	0.012084	0.012313
50	0.019260	0.018538
55	0.025368	0.021775
60	0.030036	0.024450
65	0.036528	0.028200

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	**2025**	**2030**	**2035**	**2040**	**2045**
Males	16.0	16.4	16.9	17.4	17.8
Females	17.7	18.2	18.6	19.1	19.5

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 2.90%. 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 6.85% investment return rate represents the anticipated net return after payment of all investment and administrative expenses.

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 6.85% 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 using the ultimate rates from the MP-2020 mortality improvement scale using. 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.