Utah Retirement Systems

Actuarial Experience Study

For the Period Ending December 31, 2019

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Subject: Results of 2020 Actuarial Experience Study for URS

We are pleased to present our report on the results of the 2020 Actuarial Experience Study for the Utah Retirement Systems (URS). This report is generally based on plan experience for the period ending December 31, 2019.

This report includes summaries and analysis of the experience data. Based on this analysis, we have recommended a new set of actuarial assumptions to be effective for the January 1, 2020 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. However, given the impact that the COVID-19 pandemic has had on the investment markets, forward-looking expectations on the investment universe that are developed by investment professionals have been changing on a month to month basis since early 2020. Therefore, we recommended to URS to delay an analysis of the investment return assumption until next year and this year's assumption review will cover the demographic assumptions and certain economic assumptions that have demographic components. 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,

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Consultant

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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 (analysis of economic assumptions will be reviewed in 2021).
    b. Generally used data from the five-year period ending December 31, 2019 (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. Analysis will be performed in 2021.

3. Annual investment return rate
    a. Currently 6.95% per annum.
    b. Assumed annual rate represents total return, net of administrative and investment expenses and is currently composed of a 2.50% inflation rate and a 4.45% net real rate of return.
    c. Analysis will be performed in 2021.

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.

5. Salary increase rate
    a. Separate assumptions currently used for state employees, local government employees, teachers, public safety, and firefighters.
    b. Assumption is composed of wage inflation and service-related increases to capture step-increases, promotions, additional degrees, etc.
    c. Wage inflation equals price inflation plus "productivity" increases.
    d. Currently wage inflation assumption is 3.25% for all employee groups (2.50% price inflation plus 0.75% productivity).
    e. Currently use graded scale based on years of service for shorter service employees.
    f. Recommend slight decreases in the service-related increases for state and local government employees, educators, and firefighters. Recommend a slight increase in the service related increase assumption for public safety members.

6. Payroll growth rate
    a. Rate at which the total payroll is expected to grow each year.
    b. Current assumed payroll growth rate is 3.00%.
    c. Only affects contribution rates, not actuarial liabilities.
    d. We recommend decreasing this assuming to 2.90%.

7. Post-retirement mortality for healthy retirees:
    a. Current assumption is based on URS retiree experience through December 31, 2016. We use a multiplier adjustment for any differences between the different employee groups (such as educators and general employees). Mortality is assumed to improve using the mortality improvement Scale AA assumption.
    b. The experience shows that mortality for all employee groups and both genders has not improved as much as expected.
    c. We recommend the use of a new base mortality table that is based on URS experience through December 31, 2019 (with a multiplier adjustment for any differences between the different employee groups). We also recommend updating the mortality improvement assumption to 80% of the ultimate improvement rates in Scale MP-2019.

8. Disabled mortality:
    a. Current assumption is based on the RP-2014 mortality tables for Disabled Annuitants with projected improvement using the Scale AA mortality improvement assumption.
    b. Relatively few disabled retirees compared to the number of service retirees.
    c. Recommend updating base mortality table to PUB-2010 mortality table for Disabled lives and changing the improvement assumption to be 80% of the ultimate improvement rates in Scale MP-2019.

9. Pre-termination mortality:
    a. Recommend changing the base tables to 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 almost all membership groups.
    b. Rates of incidence for state and local government employees, and public safety members were decreased. Rates for male educators were left unchanged and rates for female educators were decreased. Rates for firefighters were slightly increased.

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 and decreased at other ages.
    b. The rates of retirement for members in the Tier II Hybrid Plans (Public Employee and Public Safety and Firefighters) are equal to 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 changes to the termination rates for state and local government employees and female teachers to increase this margin and increasing the termination rates for male teachers, public safety employees, and firefighters to eliminate some excessive margin.

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 will be 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 (17 years as of January 1, 2020).

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, 2017 actuarial valuation. For this experience study, we have reviewed and analyzed URS's data for the five-year period from December 31, 2014 through December 31, 2019. Note that the first two years, calendar years 2015 and 2016, 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. For example, in the case of salary increases, we used data gathered for the last ten years because the results are quite variable from year to year.

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 the current 3.25% 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 66, 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.

Introduction

Comments Regarding Possible Impact of COVID-19 on the Retirement System

All of the demographic experience used in this analysis was prior to the onset of the COVID-19 pandemic in the United States. Therefore we believe it is relevant to discuss the potential impact of the pandemic on the Retirement System.

At this time, whether the pandemic will have material impact on the mortality experience of URS is unknown. For reference, as of January 1, 2020, URS has approximately 70,700 retirees and beneficiaries receiving benefits and averages approximately 1,500 to 1,600 deaths in each of the last few years. As of the July 7, 2020, the number of deaths due to COVID-19 positive residents in the State of Utah was 201. We do not know how many of these deaths were related to URS members.

Additionally, it is uncertain how retirement and turnover behavior may change during the next year. Some active members may choose to retire due to health concerns while others may continue to work due to uncertainty in their retirement readiness because of the financial market turmoil. Similarly, we would expect voluntary turnover to decrease due to a decrease in alternative employment opportunities, but there could be an increase in involuntary turnover due to a decrease in employer budgets. Similarly, if government budgets are constrained, we would expect salary increases for individual members to be depressed for the next few years (similar to what URS members experience for several years following the 2008-2009 financial collapse).

But probably, most importantly is the uncertainty in the future investment returns from the financial markets. We have experienced very rapid decline and recovery in the financial markets during the first half of 2020, much of this recovery is attributable to the federal stimulus legislation and actions taken by the Federal Reserve to stabilize financial markets. However, given the uncertainty with current forward-looking expectations, we recommend the Board delay the review of the investment return assumption until next year when the investment professionals should have a clearer understanding of future market expectations.

SECTION C

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Analysis of Experience and Recommendations

This report will begin with an overview of the inflation and investment return assumptions. These assumptions are documented in this report for completeness, but we recommend the Board defer the review of these assumptions until next year when the future expectations of inflation and the investment markets can be identified with greater confidence. This experience study will analyze and review the salary increase assumptions for individuals, the payroll growth rate, and the COLA as they have a demographic component to their development. Then the report will cover the demographic assumptions: mortality, disability, termination, retirement, etc. Finally, the report will discuss the recommended actuarial methods.

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 believe the current assumption remains reasonable for performing the January 1, 2020 valuation, but recommend the Board review this assumption in 2021.

Investment Return Assumption

The investment return assumption is currently 6.95%, net of investment and administrative expenses. We believe this assumption is reasonable for performing the January 1, 2020 actuarial valuation, but recommend the Board review this assumption in 2021.

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.

Given the price inflation assumption is 2.50% and the COLA provided to retirees is based on the actual increase in CPI, we recommend the COLA assumption for all funds be equal to the current 2.50% price inflation assumption.

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:

Experience excluded in this analysis

New Experience included in analysis

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%
Average 07-16	**4.0%**	**4.6%**	**4.1%**	**4.2%**	**4.1%**
Average 10-19	**3.7%**	**4.7%**	**4.0%**	**4.2%**	**4.1%**

As the table shows, the average salary increases members received in 2017, 2018, and 2019 were much higher than the first three years of the observation period (e.g. 2010, 2011, and 2012). However, the 10-year average remains relatively unchanged for each membership type since the prior experience study because the prior experience study included the salary experience for 2007 and 2008, which had higher salary increases than each of the last three years in this analysis.

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

Analysis of Experience and Recommendations

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". The current wage inflation assumption is 3.25% for all member types in URS.

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 2018, for the economy as a whole, wage inflation has outpaced price inflation by about 0.8% 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 0.8% and 0.6%, respectively. However, the average for the last five years was 1.5% in part due to a favorable economy of low employment and low price inflation.

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

Group	Average Salary Increase	Price Inflation	Difference
Teachers	2.38%	1.75%	0.63%
State	2.39%	1.75%	0.64%
Local Government	2.63%	1.75%	0.88%
Public Safety	2.83%	1.75%	1.08%
Firefighters	2.06%	1.75%	0.31%

Analysis of Experience and Recommendations

As you can see, average pay increases for long-service employees over the last 10 years was between 0.6% and 0.9% over inflation for teachers, state and local government employees. This experience is similar to what was seen during the last experience study meaning that pay increases over inflation in 2007-2009 were similar to that in 2017-2019.

However, during this same time period, average pay increases over inflation for long service public safety members and firefighters has been about 1.1% and 0.3%, respectively. The experience for firefighters is consistent with that seen in the prior experience study.

Based on this experience, there is still significant evidence that salary increases for long-term employees exceeded inflation during the last 10-years. We recommend no change in the wage inflation assumption of 3.25% (2.50% price inflation plus 0.75% productivity increase) for all employee groups. While there is a noticeable difference in the salary experience for long service public safety members and firefighters, we are not recommending a different assumption for these employees. On a theoretical basis, we would expect salary increases between these employee groups to balance in the long-term, averaging to the 3.25% assumption. If this gap is not reduced, we would eventually expect firefighters to leave their positions or become public safety members because of the compensation differential.

The average total salary increase for continuing judges over the 10-year period was 0.9%. 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 four years of service received an average increase of 6.07%, or a 3.69% increase above than the average increase of 2.38% for teachers with twenty-five or more years of service.

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

Salary increase assumptions (overall)

The overall effect of the changes to the step increases was to slightly decrease the average increase for all groups except public safety which we recommend slight increases in the salary increase assumption.

Analysis of Experience and Recommendations

The following table shows the average increases, in excess of inflation, for continuing members for the last ten years, compared to the average expected increases in excess of inflation under the current and proposed assumptions:

Group	Actual Increase	Actual Inflation	Salary Increase over Inflation		
			Actual[1]	Current[2]	Proposed[3]
State Employees	3.72%	1.75%	1.97%	2.07%	2.04%
Teachers	4.63%	1.75%	2.88%	3.10%	2.94%
Local Gov't.	3.99%	1.75%	2.24%	2.13%	2.09%
Public Safety	4.17%	1.75%	2.42%	2.29%	2.32%
Firefighters	4.07%	1.75%	2.32%	2.92%	2.78%

[1] The actual salary increase in excess of inflation for all continuing active members during the 10-year observation period.
[2] The expected average increase in salary in excess of the current 2.50% assumed rate of inflation.
[3] The expected average increase in salary in excess of the proposed 2.50% assumed rate of inflation.

More detail is shown on the tables in Section F. See pages 90-94.

Payroll growth rate

The salary increase rates discussed above are assumptions applied to individuals and are 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. Therefore, we use a separate payroll growth assumption (currently 3.00% annually) in determining the annual payment to amortize the unfunded actuarial accrued liability.

Payroll can grow at a rate different from the average pay increase for individual members. There are two reasons for this. First, when older, longer-service members terminate 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.

Analysis of Experience and Recommendations

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	4.7%	0.7%	4.0%
Last 10 Years	2.7%	0.0%	2.7%
Last 15 Years	3.3%	0.5%	2.8%
Last 20 Years	3.5%	0.6%	2.9%

The strength of the economy during the last five years resulted in a noticeable increase in covered payroll and membership. Note, while payroll growth, adjusted for change in membership, was 2.9% over the last 20 years, actual inflation was also lower than assumed (2.1% actual versus 2.50% assumed). If we assume that the last 20-years was representative of the next 20 years, which coincides with the Board's funding period, and adjust the experience for the difference in inflation then we would expect payroll growth to be 3.3% (i.e. 2.9% + (2.50% - 2.1%)).

Also, in theory, payroll growth in the absence of membership growth should be approximately the 3.25% wage inflation assumption (i.e. assumed rate of payroll increase for long-service employees). However, long-term projections that do not anticipate membership growth show that total payroll is expected to grow more slowly over the next 20 years as current active members retire and are replaced by new members with lower salaries.

Based on this information, and including the historical growth in membership, we are recommending setting this assumption at 2.90%, a 10-basis point decrease from the current assumption.

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.

Analysis of Experience and Recommendations

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, 2016. 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: 2017 PR Utah Retiree Mortality Table for males multiplied by 110%
- Female: 2017 PR Utah Retiree Mortality Table for females multiplied by 110%

Current Assumption: Retired educators as well as retired judges

- Male: 2017 PR Utah Retiree Mortality Table for males multiplied by 90%
- Female: 2017 PR Utah Retiree Mortality Table for females multiplied by 90%

The base mortality table is projected using projection Scale AA using a base year of 2017.

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 to too large to be considered fully credible for mortality section. Other sources suggest

higher requirements, such as 1,000 deaths per gender is necessary to be considered fully credible. The following table gives the number of deaths needed by gender to have a given level of confidence that the data is +/- X% of the actual pattern.

Standard Score	Confidence	99% - 101%	97% - 103%	95% - 105%	90% - 110%	80% - 120%
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 3,584 male deaths and 3,844 female deaths during the five-year period ending December 31, 2019. 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 seven-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 was used by the Society of Actuaries (SOA) when they developed the most recently published mortality tables.

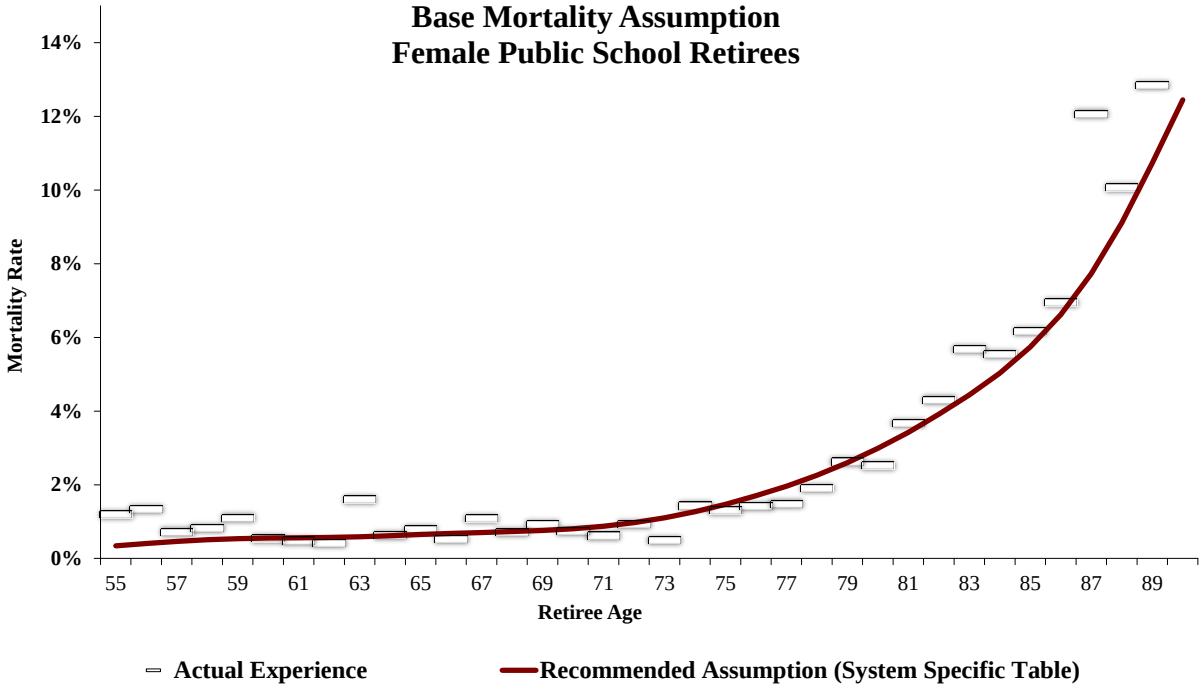
A mortality table based on actual URS experience was constructed during the last experience study, as well. We noted that, at the time of that experience study, the published mortality tables available were not a reasonable fit to the System's observed mortality experience. Since the last experience study the SOA completed a mortality study based on data solely from public sector pension systems. This study included a separate analysis of mortality experience for teachers, public safety professionals and general employees. The SOA released these mortality tables, referred to as Pub-2010, in their final report dated February 25, 2019. We compared URS experience to the relevant Pub-2010 mortality tables and found that while a multiple of the Pub-2010 mortality tables provided an acceptable fit at ages 70-80, URS mortality rates were materially higher than the published mortality tables for retires under age 65 and over age 90. As a result, we recommend the continued use of a URS specific mortality assumption, with an updated base mortality table to reflect the System's experience since the last experience study.

Mortality rates for the core ages of retirees age 65 to 94 are based on URS retiree experience, using a cubic spline method to provide a smooth fit to the midpoint of the experience. The mortality rates for

ages under age 65 and ages 95 and older were phased-in to the Pub-2010 amount weighted table for general employees adjusted to the center point of the analysis period (i.e. the year 2016) using 80% of the ultimate improvement rates in the MP-2019 projection assumption. The final step in the creation of the base mortality assumptions was to project the preliminary table from the center point of the analysis period to the year 2020 using 80% of the ultimate improvement rates in the MP-2019 projection assumption. We will refer to this new table as the 2020 Public Retirees of Utah Mortality Table (2020 PR UTAH). See discussion below regarding the mortality projection assumption.

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

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, and 2019).

The current mortality improvement assumption (Scale AA) was based upon a blend of mortality improvement trends among Civil Service Retirement System (CSRS) and Social Security Administration

participants between 1977 and 1993. The rate of improvement for males is approximately twice that of females. While the difference in improvement for males and females once occurred, it is not likely to be representative of the continued rate of improvement for both genders in future years.

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 reach the same ultimate improvement rate of approximately 1% per year. However, the SOA report associated with the release of the latest available MP version (MP-2019) documented that the Technical Panel observed that while mortality improvement has been on average 1% for the broad population, it has only been 0.8% per year for people over age 65. Additionally, the mortality improvement assumption used in the 2020 Social Security Trustees report for recipients over age 65 is approximately 0.8% in the near-term declining to 0.6% per year in 2085.

Therefore, we recommend using a mortality improvement assumption that reflects an ultimate rate of mortality improvement of approximately 0.8% for retirees over age 65. To do this we are recommending the use of 80% of the ultimate rate of improvement from the projection Scale MP-2019.

Recommended Non-Disabled Mortality Assumption

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

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
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 80% of the ultimate rate of improvement in projection Scale MP-2019 using a base year of 2020.

Analysis of Experience and Recommendations

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				
	2020	**2025**	**2030**	**2035**	**2040**
Male Educators	22.6	22.9	23.2	23.5	23.8
Female Educators	24.3	24.6	24.9	25.2	25.5
Male Noneducators	21.0	21.3	21.6	21.9	22.2
Female Noneducators	22.7	23.0	23.3	23.6	23.9

More detail is shown on the table on pages 36-41 in Section F.

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 numbers of disabled retirees and disabled deaths, we combined all the disabled lives for our analysis and also used seven years of experience. The analysis was also performed on a benefit-weighted basis. The valuation currently uses the RP-2014 Mortality Table for disabled annuitants (separate tables for males and females with the base table adjusted with a 110% multiplier for disabled males and a 120% multiplier for disabled females), and the generational improvement assumption Scale AA to project future improvements in mortality. Thus, mortality improvement is currently projected consistently for both non-disabled and disabled retirees in the valuation.

Based on the current experience (on a benefit weighted basis), the A/E ratio was 103% for both males and females. However, because there were only 258 and 291 male and female deaths during the observation period, the experience is only about 50% statistically credible. Since the last experience study, the SOA also issued new disability mortality tables based on the experience of public retirement systems. As a result, we recommend updating the disability mortality assumption for all employee groups to the PUB-2010 disabled retiree mortality table for general employees and use a multiplier of 115% for males and 125% for females. We also recommend applying generational mortality improvement to these tables using 80% of the ultimate rate of improvement in projection Scale MP-2019 using a base year of 2010.

More detail is shown on the table on pages 42-43 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 recommend updating this mortality assumption to use the public employee mortality tables developed by the SOA. Specifically the valuation will use 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 also reviewed the number of line-of-duty deaths in the public safety and firefighter systems. During the last five years there were 46 public safety members and firefighters that died while an active member, 15 of whom died in the line-of-duty or approximately 33%. We recommend the continued use of the assumption that 25% of active deaths will occur in the line-of-duty.

More detail is shown on the tables on pages 44-53 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. The overall A/E ratio based on the current assumptions was 58% (527 new disabilities during the study period vs. 912 expected), which is a decrease in the number of disabilities since the last experience study. 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 male educators and firefighters) to decrease the number of expected disabilities. We recommend no change to the male educator disability assumption and a slight increase for firefighters. Under the new recommended assumptions, the overall A/E ratio is now 77% (684 expected disabilities). The following table provides the proposed multiplier by employee group.

Group	Current Multiplier	Proposed Multiplier
State & Local - males	100%	65%
State & Local - females	85%	65%
Educators - males	45%	45%
Educators - females	60%	50%
Public Safety	120%	75%
Firefighters	210%	235%

Analysis of Experience and Recommendations

No disability rates are used for the Judges System or the Governors and Legislative Plan. More detail is shown on the tables on pages 54-61 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. 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).

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	66,800	75,055	73,642
Educators - females	184,496	202,955	199,633
State - males	128,306	146,128	139,779
State – females	180,726	202,976	195,493
Local - males	90,085	101,560	97,748
Local - females	64,845	70,939	70,257
Public Safety	89,098	93,369	93,044
Firefighters	18,651	20,034	21,032
Judges	4,155	4,065	3,908

Amounts in thousands. Excludes retirements where 100% retirement assumed (after age 74 for public employees and age 69 for public safety, firefighters, and judges).

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 decrease in the expected retirements (except for firefighters).

We reduced the retirement rates for judges with less than 25 years of experience and increased the rates of retirement above age 64 for judges with 25 or more years of experience. Note there are

only 116 active members in the Judges fund, 17 of whom are currently retirement eligible; as a result, there is expected to be more fluctuation between actual and expected retirements for this system.

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. Retirement benefits provided in the Tier II Systems are slightly lower than benefits provided in the Tier I system. 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 setting the Tier II public employee rates of retirement for members eligible for normal retirement equal to the Tier I public employee retirement rates. Since the eligibility for retirement in Tier II requires five more years of service compared to members in Tier I, we have included a 30% increase (i.e. add 30%) to account for an anticipated pent-up demand to retire for Tier II members who attain 35 years of service prior to age 65 (i.e. their first eligibility for a normal retirement benefit under age 65). We recommend no change in the retirement rates for Tier II public employee members eligible for early reduced retirement.

Similarly, and as a result of the increased benefit multiplier in the Tier II public safety and firefighters System, 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 70-89. 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 10-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).

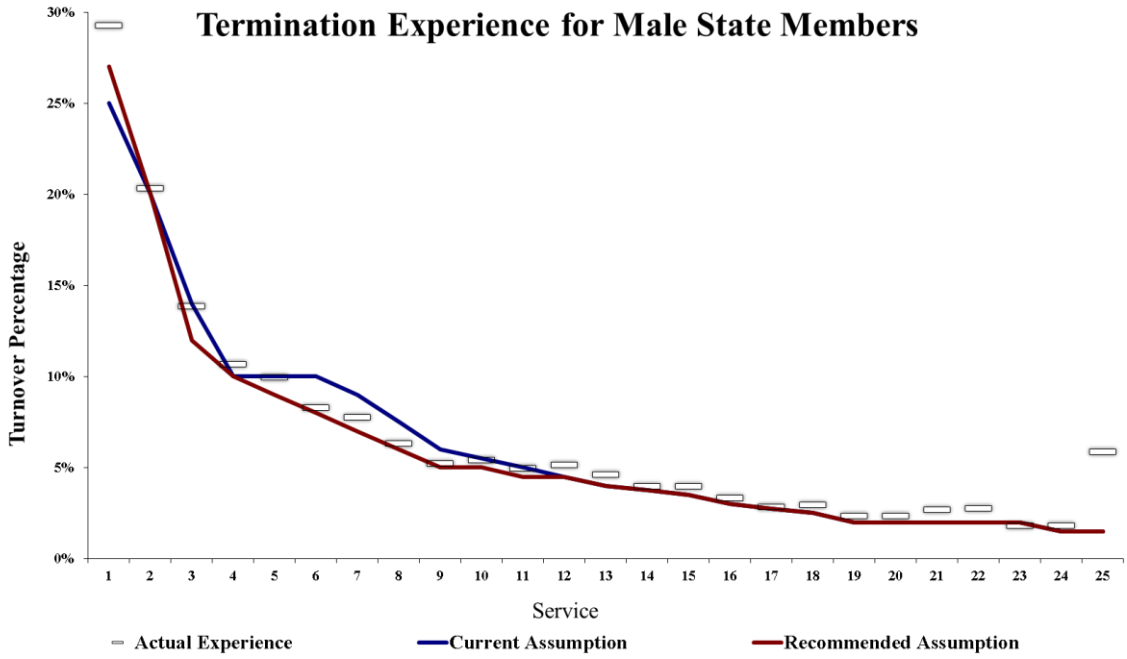
Group	Actual Terminations	Expected Current Assumption	Expected Proposed Assumption
Educators - males	163,320	136,317	147,857
Educators - females	532,514	500,552	485,017
State - males	401,624	391,772	367,186
State - females	601,274	587,166	551,258
Local - males	289,441	269,534	266,207
Local - females	287,479	263,059	261,463
Public Safety	116,153	103,844	108,138
Firefighters	17,055	15,483	15,780

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, based on experience over the last 10 years, we believe additional margin is needed (i.e. termination rates were decreased) in all the membership groups of the public employee system (local government, state employees, and educators) except for male educators. On the other hand, we recommend increasing the termination rates and removing some of the existing margin in the assumption for male educators, members in public safety, and firefighters.

Analysis of Experience and Recommendations

The following is a chart showing the actual experience, current assumption, and recommended assumption for males state members.



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 62-69 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 percentages grades down from 100% for all non-vested members to 0% after 20 years of service. As of January 1, 2020, there were only 450 and 1,490 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 6.95% 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 6.95% is reflected immediately in the AVA, and the other 5.05% 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 provided intergenerational equity for taxpayers with respect to system costs;
- To manage investment risk with a diversified asset allocation and asset smoothing;
- To require employers to contribute the greater of the actuarial calculated contribution rate or the previous year's contribution rate until the Systems 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, 2020 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

Comparison of FY 2021 Contribution Rates with the Actuarially Determined Contribution Rates Based on the 2020 Actuarial Valuation

Fund/Division	FY2021 Board Certified Contribution Rates	Calculated Rate		Change in Calculated Rate
		Current Assumptions	Recommended Assumptions	
(1)	(2)	(3)	(4)	(5)
I. Public Employees Contributory				
A. Local Government	**14.46%**	11.07%	10.98%	-0.09%
B. State and School	**16.85%**	13.81%	14.28%	0.47%
C. Higher Education	**16.85%**	14.67%	15.11%	0.44%
II. Public Employees Noncontributory				
A. Local Government	**18.47%**	15.08%	14.99%	-0.09%
B. State and School	**21.34%**	18.30%	18.77%	0.47%
C. Higher Education	**21.34%**	19.16%	19.60%	0.44%
III. Public Safety Contributory				
A. Other Division A (2.5% COLA)	**22.79%**	20.33%	20.25%	-0.08%
B. Other Division A (4% COLA)	**24.37%**	19.30%	19.15%	-0.15%
C. Other Division B (2.5% COLA)	**22.81%**	22.66%	22.50%	-0.16%
D. Other Division B (4% COLA)	**28.98%**	18.59%	18.52%	-0.07%
IV. Public Safety Noncontributory				
A. State	**40.50%**	33.48%	33.48%	0.00%
B. Other Division A (2.5% COLA)	**34.04%**	31.68%	31.52%	-0.16%
C. Other Division A (4% COLA)	**35.71%**	30.80%	30.61%	-0.19%
D. Salt Lake City	**46.71%**	41.36%	41.37%	0.01%
E. Ogden	**48.72%**	42.35%	42.37%	0.02%
F. Provo	**42.23%**	38.97%	38.92%	-0.05%
G. Logan	**41.97%**	38.37%	38.19%	-0.18%
H. Bountiful	**50.38%**	44.24%	44.43%	0.19%
I. Other Division B (2.5% COLA)	**32.28%**	32.11%	31.89%	-0.22%
J. Other Division B (4% COLA)	**38.97%**	28.69%	28.52%	-0.17%
V. Firefighters				
A. Division A	**15.67%**	10.89%	10.90%	0.01%
B. Division B	**18.30%**	7.99%	8.25%	0.26%
VI. Judges	**51.06%**	48.43%	49.18%	0.75%
VII. 3% Substantial Substitute	**0.85%**	0.53%	0.54%	0.01%
VIII. Tier II - Hybrid Plans				
A. Public Employees	**9.11%**	9.20%	9.38%	0.18%
B. Public Safety and Firefighter	**16.27%**	16.35%	16.08%	-0.27%

Note: Rates shown for Firefighters and Judges exclude offsets for fire insurance premium tax and court fees.
Rates exclude 3% Substantial Substitute.
Rates for Tier II Public Employee Systems exclude the cost of the 75% of pay active death benefit.
The preliminary contribution rates for FY 2021 reflect application of U.C. Sec. 49-11-3015(5).

Actuarial Impact of Recommendations

Comparison of Unfunded Actuarial Accrued Liability (UAAL)

($ in millions)

	Fund/Division	2019 Valuation	Current Assumptions	Recommended Assumptions	Increase / (Decrease) (4) - (3)
	(1)	(2)	(3)	(4)	(5)
I.	Public Employees Contributory				
	A. Local Government	$ 21	$ 20	$ 20	$ (0)
	B. State and School	22	18	19	1
	C. Higher Education	7	6	6	0
II.	Public Employees Noncontributory				
	A. Local Government	632	635	629	(6)
	B. State and School	2,728	2,770	2,938	167
	C. Higher Education	272	203	209	6
III.	Public Safety Contributory				
	A. Other Division A (2.5% COLA)	3	3	3	(0)
	B. Other Division A (4% COLA)	0	0	0	(0)
	C. Other Division B (2.5% COLA)	0	0	0	(0)
	D. Other Division B (4% COLA)	0	0	0	(0)
IV.	Public Safety Noncontributory				
	A. State	212	205	205	1
	B. Other Division A (2.5% COLA)	164	186	184	(3)
	C. Other Division A (4% COLA)	50	47	46	(1)
	D. Salt Lake City	95	94	94	(0)
	E. Ogden	21	19	19	(0)
	F. Provo	13	14	14	(0)
	G. Logan	6	7	7	(0)
	H. Bountiful	7	7	7	0
	I. Other Division B (2.5% COLA)	80	94	92	(2)
	J. Other Division B (4% COLA)	4	4	4	(0)
V.	Firefighters				
	A. Division A	7	(1)	(1)	1
	B. Division B	10	(17)	(12)	5
VI.	Judges	50	47	50	3
VII.	3% Substantial Substitute	301	300	305	5
VIII.	Governors and Legislative	2	2	2	0
IX.	Tier II - Hybrid Plans				
	A. Public Employees	35	47	56	8
	B. Public Safety and Firefighter	5	14	13	(0)
X.	Grand Total	$ 4,745	$ 4,725	$ 4,910	$ 185

Columns may not add to total due to rounding.

SECTION E

SUMMARY OF RECOMMENDATIONS

Summary of Recommendations

1. No change to the 2.50% price inflation assumption and to review in 2021.
2. No change to the 6.95% investment return assumption and to review in 2021.
3. No change to the 3.25 wage inflation component of the salary assumption and make minor adjustments to the step-rate component of the salary increases for some of the groups.
4. Decrease the payroll growth rate assumption by 0.10% from 3.00% to 2.90%.
5. Update the constructed post-retirement mortality assumption based on URS experience. Separate adjustments to the table for educators and non-educators. Update the improvement assumption to 80% of the ultimate improvement assumption in the MP-2019 table (i.e. 0.8% annual improvement in mortality for ages below age 85).
6. Move to the most recent published table for disabled retiree mortality assumption.
7. Move to the most recent published table for active member mortality tables.
8. Minor overall decreases to the rates of disability incidence.
9. Small modifications (some up some down) to the rates of retirement for most employment groups.
10. Overall minor decrease in the rates of termination for most groups. Slight increases to certain ages for public safety and firefighters.
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

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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.08%	0.08%	$ -	$ -	0%	0%
45-49	0	1,349	0.0000	0.13%	0.17%	2.0	3.0	0%	0%
50-54	30	20,085	0.0015	0.21%	0.36%	44.5	77.3	67%	39%
55-59	651	90,183	0.0072	0.32%	0.53%	298.9	506.1	218%	129%
60-64	2,067	233,053	0.0089	0.54%	0.87%	1,333.2	2,007.5	155%	103%
65-69	4,171	429,958	0.0097	0.99%	0.98%	4,360.9	4,418.3	96%	94%
70-74	6,170	382,045	0.0162	1.79%	1.72%	6,812.7	6,507.3	91%	95%
75-79	7,189	247,022	0.0291	3.27%	3.06%	8,002.9	7,586.7	90%	95%
80-84	9,454	145,256	0.0651	6.05%	6.34%	8,633.5	8,979.9	110%	105%
85-89	8,270	76,369	0.1083	11.08%	11.14%	8,348.8	8,346.1	99%	99%
90-94	4,963	26,696	0.1859	20.35%	20.25%	5,110.6	5,113.4	97%	97%
95-99	1,456	3,542	0.4109	35.31%	33.07%	1,134.5	1,147.0	128%	127%
Other	63	96	0.6530			42.4	35.8	149%	176%
Totals	$ 44,483	$ 1,655,656				$ 44,125	$ 44,728	101%	99%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.05%	0.05%	$ -	$ -	0%	0%
45-49	27	1,142	0.0237	0.09%	0.11%	1.1	1.8	2400%	1539%
50-54	98	15,025	0.0065	0.13%	0.26%	21.2	44.6	464%	220%
55-59	570	73,562	0.0077	0.20%	0.57%	160.2	426.1	355%	134%
60-64	1,863	238,857	0.0078	0.38%	0.70%	978.7	1,711.3	190%	109%
65-69	3,714	456,733	0.0081	0.72%	0.86%	3,364.1	3,943.2	110%	94%
70-74	4,896	363,281	0.0135	1.37%	1.18%	4,931.3	4,368.9	99%	112%
75-79	5,590	221,114	0.0253	2.59%	2.40%	5,631.3	5,215.2	99%	107%
80-84	5,684	127,487	0.0446	4.92%	4.78%	6,188.0	5,985.8	92%	95%
85-89	5,028	62,723	0.0802	9.43%	9.45%	5,775.0	5,832.2	87%	86%
90-94	4,357	24,236	0.1798	17.98%	19.33%	4,129.4	4,391.0	106%	99%
95-99	1,130	4,780	0.2363	32.20%	25.31%	1,439.0	1,181.8	79%	96%
Other	175	465	0.3773			188.8	156.2	93%	112%
Totals	$ 33,133	$ 1,589,405				$ 32,808	$ 33,258	101%	100%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.06%	0.07%	$ -	$ -	0%	0%
45-49	0	0	N/A	0.11%	0.14%	0	0	0%	0%
50-54	39	3,060	0.0128	0.17%	0.30%	5.7	9.9	691%	398%
55-59	113	26,966	0.0042	0.26%	0.43%	74.2	125.6	153%	90%
60-64	1,407	110,403	0.0127	0.44%	0.71%	524.1	783.4	268%	180%
65-69	1,516	221,794	0.0068	0.81%	0.80%	1,845.0	1,868.2	82%	81%
70-74	3,143	227,658	0.0138	1.46%	1.41%	3,348.8	3,196.4	94%	98%
75-79	3,489	176,506	0.0198	2.68%	2.51%	4,714.8	4,474.9	74%	78%
80-84	5,507	123,451	0.0446	4.95%	5.19%	6,082.4	6,327.9	91%	87%
85-89	6,209	66,934	0.0928	9.07%	9.12%	5,876.2	5,888.5	106%	105%
90-94	3,745	19,554	0.1915	16.65%	16.57%	3,048.4	3,041.3	123%	123%
95-99	715	2,401	0.2977	28.89%	27.06%	635.6	636.7	112%	112%
Other	43	118	0.3653			42.4	36.9	101%	117%
Totals	$ 25,925	$ 978,845				$ 26,198	$ 26,390	99%	98%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ -	N/A	0.04%	0.04%	$ -	$ -	0%	0%
45-49	0	244	0.0000	0.07%	0.09%	0.2	0.3	0%	0%
50-54	68	10,467	0.0065	0.11%	0.21%	12.5	26.8	548%	255%
55-59	711	70,742	0.0101	0.17%	0.46%	127.8	339.3	557%	210%
60-64	1,744	220,804	0.0079	0.31%	0.57%	729.2	1,289.8	239%	135%
65-69	3,270	402,433	0.0081	0.59%	0.70%	2,436.1	2,846.6	134%	115%
70-74	2,583	314,888	0.0082	1.12%	0.97%	3,478.6	3,083.6	74%	84%
75-79	3,127	184,895	0.0169	2.12%	1.96%	3,878.8	3,594.7	81%	87%
80-84	4,243	103,259	0.0411	4.02%	3.91%	4,071.7	3,937.8	104%	108%
85-89	4,951	53,785	0.0921	7.72%	7.73%	4,073.9	4,118.0	122%	120%
90-94	3,073	18,492	0.1662	14.71%	15.82%	2,545.7	2,715.3	121%	113%
95-99	989	4,138	0.2390	26.35%	20.71%	1,037.0	843.5	95%	117%
Other	208	389	0.5345			128.8	101.1	161%	206%
Totals	$ 24,968	$ 1,384,538				$ 22,520	$ 22,897	111%	109%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ 8,189	0.0000	0.08%	0.08%	$ 7.3	$ 7.3	0%	0%
45-49	98	57,207	0.0017	0.13%	0.17%	78.0	109.5	126%	90%
50-54	167	98,491	0.0017	0.21%	0.36%	207.3	360.6	81%	46%
55-59	545	143,695	0.0038	0.32%	0.53%	467.7	792.0	117%	69%
60-64	1,341	221,707	0.0060	0.54%	0.87%	1,232.8	1,885.4	109%	71%
65-69	2,101	251,092	0.0084	0.99%	0.98%	2,500.4	2,554.7	84%	82%
70-74	2,892	176,982	0.0163	1.79%	1.72%	3,117.3	2,980.5	93%	97%
75-79	3,429	100,374	0.0342	3.27%	3.06%	3,252.8	3,083.7	105%	111%
80-84	3,697	51,404	0.0719	6.05%	6.34%	3,037.7	3,158.9	122%	117%
85-89	2,454	22,041	0.1113	11.08%	11.14%	2,370.5	2,375.1	104%	103%
90-94	1,294	6,247	0.2071	20.35%	20.25%	1,176.1	1,170.3	110%	111%
95-99	278	733	0.3793	35.31%	33.07%	239.0	237.8	116%	117%
Other	28	169	0.1635			35.0	29.5	79%	94%
Totals	$ 18,324	$ 1,138,331				$ 17,722	$ 18,745	103%	98%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ 1,331	0.0000	0.05%	0.05%	$ 0.8	$ 0.7	0%	0%
45-49	0	6,794	0.0000	0.09%	0.11%	6.2	8.7	0%	0%
50-54	13	12,503	0.0011	0.13%	0.26%	16.9	34.8	78%	38%
55-59	24	17,037	0.0014	0.20%	0.57%	35.8	95.3	66%	25%
60-64	138	21,767	0.0063	0.38%	0.70%	84.5	154.0	163%	90%
65-69	232	18,049	0.0129	0.72%	0.86%	128.9	154.3	180%	151%
70-74	156	10,290	0.0151	1.37%	1.18%	137.6	122.1	113%	127%
75-79	149	5,665	0.0263	2.59%	2.40%	145.7	135.1	102%	110%
80-84	196	4,222	0.0465	4.92%	4.78%	209.2	202.6	94%	97%
85-89	190	1,824	0.1041	9.43%	9.45%	160.1	160.4	119%	118%
90-94	182	657	0.2767	17.98%	19.33%	108.0	116.0	168%	157%
95-99	45	193	0.2354	32.20%	25.31%	54.5	46.3	83%	98%
Other	9	298	0.0297			14.1	11.6	63%	76%
Totals	$ 1,334	$ 100,630				$ 1,102	$ 1,242	121%	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
ALL DISABLED MALES
WEIGHTED BY AMOUNT OF ANNUITY

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ 26	$ 1,909	0.0136	1.76%	0.84%	$ 33.6	$ 16.3	77%	159%
45-49	31	2,984	0.0104	2.12%	1.34%	63.1	40.5	49%	77%
50-54	66	4,266	0.0156	2.20%	1.99%	94.2	85.3	70%	78%
55-59	34	6,286	0.0054	2.37%	2.50%	151.0	158.2	22%	21%
60-64	331	11,985	0.0276	2.92%	2.93%	358.6	357.6	92%	93%
65-69	971	19,215	0.0505	3.93%	3.67%	754.2	708.0	129%	137%
70-74	953	16,815	0.0567	5.23%	4.76%	876.8	799.8	109%	119%
75-79	824	9,686	0.0851	7.39%	6.49%	708.4	622.3	116%	132%
80-84	574	5,203	0.1103	11.06%	9.39%	566.9	482.6	101%	119%
85-89	317	2,501	0.1269	16.64%	13.83%	406.3	338.7	78%	94%
90-94	163	681	0.2386	25.15%	21.06%	161.2	134.8	101%	121%
95-99	12	53	0.2228	33.52%	29.84%	17.3	15.3	68%	77%
Other	13	621	0.0207			7.6	3.7	170%	343%
Totals	$ 4,315	$ 82,202				$ 4,199	$ 3,763	103%	115%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40-44	$ -	$ 270	0.0000	0.94%	0.90%	$ 2.6	$ 2.5	0%	0%
45-49	14	241	0.0559	1.14%	1.39%	2.7	3.3	493%	414%
50-54	0	910	0.0000	1.38%	1.89%	13.3	17.7	0%	0%
55-59	121	4,636	0.0261	1.89%	2.18%	89.3	101.9	135%	119%
60-64	297	11,665	0.0254	2.47%	2.44%	292.6	288.2	101%	103%
65-69	640	26,170	0.0245	3.23%	2.92%	855.6	771.5	75%	83%
70-74	1,032	22,877	0.0451	4.45%	3.86%	1,012.2	881.2	102%	117%
75-79	1,067	12,973	0.0822	6.41%	5.57%	813.9	711.8	131%	150%
80-84	526	5,851	0.0898	9.54%	8.52%	549.6	490.7	96%	107%
85-89	399	2,135	0.1871	14.63%	13.14%	297.3	267.8	134%	149%
90-94	128	685	0.1871	21.41%	18.71%	143.1	125.1	90%	102%
95-99	24	114	0.2068	30.74%	27.03%	33.1	29.1	71%	81%
Other	0	79	0.0000			0.5	0.5	0%	0%
Totals	$ 4,246	$ 88,608				$ 4,106	$ 3,691	103%	115%

*$ 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	1	1,318	0.0008	0.03%	0.03%	0.5	0.4	219%	239%
25-29	0	3,946	0.0000	0.03%	0.03%	1.3	1.2	0%	0%
30-34	3	6,216	0.0005	0.03%	0.04%	2.1	2.5	143%	120%
35-39	3	8,520	0.0004	0.04%	0.05%	3.3	4.6	90%	65%
40-44	7	8,328	0.0008	0.05%	0.08%	4.3	6.4	163%	109%
45-49	12	8,398	0.0014	0.09%	0.12%	7.2	9.8	166%	122%
50-54	14	8,623	0.0016	0.15%	0.18%	12.7	15.2	110%	92%
55-59	31	9,389	0.0033	0.24%	0.26%	22.7	24.1	136%	129%
60-64	22	8,104	0.0027	0.41%	0.37%	33.2	29.9	66%	74%
65-69	18	3,627	0.0050	0.73%	0.55%	25.3	19.3	71%	93%
70-74	7	860	0.0081	1.29%	0.84%	10.3	6.8	68%	103%
Totals	118	67,329				123	120	96%	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
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	1,686	0.0000	0.01%	0.01%	0.2	0.2	0%	0%
25-29	2	5,781	0.0003	0.01%	0.01%	0.7	0.6	270%	310%
30-34	1	7,624	0.0001	0.02%	0.02%	1.3	1.4	79%	73%
35-39	2	10,234	0.0002	0.02%	0.03%	2.2	2.9	89%	70%
40-44	6	12,858	0.0005	0.03%	0.04%	4.2	5.6	141%	107%
45-49	8	15,086	0.0005	0.06%	0.07%	8.4	10.0	95%	80%
50-54	19	16,830	0.0011	0.09%	0.10%	15.1	16.5	126%	115%
55-59	32	20,271	0.0016	0.13%	0.14%	26.8	29.5	119%	109%
60-64	37	17,665	0.0021	0.19%	0.22%	33.9	39.0	109%	95%
65-69	21	6,467	0.0032	0.31%	0.36%	19.0	22.2	111%	95%
70-74	11	1,006	0.0109	0.54%	0.60%	5.0	5.6	219%	197%
Totals	139	115,508				117	133	119%	104%

*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 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	1	1,622	0.0006	0.03%	0.03%	0.6	0.5	180%	192%
25-29	1	3,588	0.0003	0.03%	0.03%	1.1	1.1	87%	88%
30-34	5	5,699	0.0009	0.03%	0.04%	1.9	2.3	260%	218%
35-39	9	7,498	0.0012	0.04%	0.05%	2.9	4.0	308%	223%
40-44	6	7,566	0.0008	0.05%	0.08%	3.9	5.8	154%	103%
45-49	16	6,893	0.0023	0.09%	0.12%	5.9	8.0	271%	199%
50-54	15	6,588	0.0023	0.15%	0.18%	9.7	11.6	155%	129%
55-59	16	7,015	0.0023	0.24%	0.26%	17.0	18.0	94%	89%
60-64	21	5,973	0.0035	0.41%	0.37%	24.4	22.0	86%	96%
65-69	3	2,231	0.0013	0.73%	0.55%	15.3	11.7	20%	26%
70-74	2	354	0.0056	1.29%	0.84%	4.3	2.8	47%	71%
Totals	95	55,027				87	88	109%	108%

*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
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	1,111	0.0000	0.01%	0.01%	0.1	0.1	0%	0%
25-29	0	3,208	0.0000	0.01%	0.01%	0.4	0.4	0%	0%
30-34	3	4,274	0.0007	0.02%	0.02%	0.7	0.8	423%	393%
35-39	2	5,195	0.0004	0.02%	0.03%	1.1	1.4	177%	138%
40-44	5	5,616	0.0009	0.03%	0.04%	1.8	2.4	272%	205%
45-49	5	5,869	0.0009	0.06%	0.07%	3.3	3.9	154%	129%
50-54	9	5,669	0.0016	0.09%	0.10%	5.1	5.6	177%	162%
55-59	6	6,455	0.0009	0.13%	0.14%	8.5	9.4	70%	64%
60-64	7	5,582	0.0013	0.19%	0.22%	10.7	12.3	65%	57%
65-69	4	2,146	0.0019	0.31%	0.36%	6.3	7.4	63%	54%
70-74	1	324	0.0031	0.54%	0.60%	1.6	1.8	63%	57%
Totals	42	45,449				40	45	106%	92%

*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 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	415	0.0000	0.03%	0.03%	0.1	0.1	0%	0%
25-29	0	2,791	0.0000	0.03%	0.02%	0.7	0.5	0%	0%
30-34	1	4,679	0.0002	0.03%	0.03%	1.3	1.2	79%	84%
35-39	0	5,783	0.0000	0.03%	0.03%	1.8	2.0	0%	0%
40-44	6	5,556	0.0011	0.04%	0.05%	2.3	2.8	262%	215%
45-49	4	5,344	0.0007	0.07%	0.08%	3.7	4.4	109%	91%
50-54	5	4,626	0.0011	0.12%	0.13%	5.4	6.2	93%	81%
55-59	10	4,175	0.0024	0.19%	0.20%	8.0	8.5	125%	118%
60-64	5	3,003	0.0017	0.33%	0.32%	9.7	9.5	51%	53%
65-69	5	1,082	0.0046	0.58%	0.53%	6.0	5.5	83%	91%
70-74	3	192	0.0156	1.03%	0.84%	1.8	1.5	164%	197%
Totals	39	37,646				41	42	95%	92%

*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
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	2,856	0.0000	0.01%	0.01%	0.2	0.3	0%	0%
25-29	0	12,615	0.0000	0.01%	0.01%	1.0	1.3	0%	0%
30-34	2	11,744	0.0002	0.01%	0.02%	1.2	1.9	165%	105%
35-39	3	13,325	0.0002	0.01%	0.02%	1.8	3.2	165%	93%
40-44	7	15,093	0.0005	0.02%	0.04%	3.1	5.7	226%	124%
45-49	4	15,340	0.0003	0.03%	0.06%	5.3	8.9	75%	45%
50-54	13	13,200	0.0010	0.06%	0.09%	7.3	11.3	177%	115%
55-59	9	12,880	0.0007	0.08%	0.12%	10.6	16.1	85%	56%
60-64	12	9,838	0.0012	0.12%	0.20%	11.8	19.1	102%	63%
65-69	10	3,308	0.0030	0.19%	0.34%	6.0	10.5	166%	96%
70-74	1	367	0.0027	0.34%	0.63%	1.1	2.0	89%	49%
Totals	61	110,566				49	80	123%	76%

*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 - 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	423	0.0000	0.03%	0.04%	0.2	0.2	0%	0%
25-29	4	3,437	0.0012	0.03%	0.04%	1.1	1.4	366%	295%
30-34	5	6,176	0.0008	0.03%	0.04%	2.1	2.7	241%	188%
35-39	6	7,126	0.0008	0.04%	0.05%	2.8	3.6	216%	165%
40-44	6	6,732	0.0009	0.05%	0.07%	3.5	4.5	173%	134%
45-49	2	4,588	0.0004	0.09%	0.10%	3.9	4.3	52%	46%
50-54	4	2,739	0.0015	0.15%	0.14%	3.9	3.8	102%	106%
55-59	1	1,657	0.0006	0.24%	0.21%	3.9	3.4	25%	30%
60-64	1	946	0.0011	0.41%	0.32%	3.8	2.9	27%	35%
65-69	2	257	0.0078	0.73%	0.53%	1.7	1.2	115%	161%
70-74	0	0	N/A	1.29%	0.98%	-	-	0%	0%
Totals	31	34,081				27	28	116%	111%

*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	78	0.0000	0.01%	0.02%	0.0	0.0	0%	0%
25-29	0	351	0.0000	0.02%	0.02%	0.1	0.1	0%	0%
30-34	0	644	0.0000	0.02%	0.03%	0.1	0.2	0%	0%
35-39	1	859	0.0012	0.03%	0.04%	0.2	0.4	430%	286%
40-44	2	840	0.0024	0.04%	0.06%	0.3	0.5	585%	428%
45-49	0	695	0.0000	0.07%	0.08%	0.5	0.5	0%	0%
50-54	1	488	0.0020	0.11%	0.10%	0.5	0.5	187%	201%
55-59	1	336	0.0030	0.16%	0.14%	0.5	0.5	183%	215%
60-64	0	165	0.0000	0.24%	0.19%	0.4	0.3	0%	0%
65-69	0	32	0.0000	0.39%	0.30%	0.1	0.1	0%	0%
70-74	0	0	N/A	0.68%	0.60%	-	-	0%	0%
Totals	5	4,488				3	3	176%	167%

*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	78	0.0000	0.03%	0.04%	0.0	0.0	0%	0%
25-29	1	615	0.0016	0.03%	0.04%	0.2	0.2	513%	411%
30-34	1	1,726	0.0006	0.03%	0.04%	0.6	0.7	171%	134%
35-39	2	2,223	0.0009	0.04%	0.05%	0.9	1.1	231%	177%
40-44	2	1,877	0.0011	0.05%	0.07%	1.0	1.3	207%	160%
45-49	1	1,284	0.0008	0.09%	0.10%	1.1	1.2	93%	83%
50-54	1	856	0.0012	0.15%	0.14%	1.2	1.2	81%	84%
55-59	0	567	0.0000	0.24%	0.21%	1.3	1.2	0%	0%
60-64	2	284	0.0070	0.41%	0.32%	1.1	0.9	177%	230%
65-69	0	50	0.0000	0.73%	0.53%	0.3	0.2	0%	0%
70-74	0	0	N/A	1.29%	0.98%	-	-	0%	0%
Totals	10	9,560				8	8	129%	124%

*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	3	0.0000	0.01%	0.02%	0.0	0.0	0%	0%
25-29	0	22	0.0000	0.02%	0.02%	0.0	0.0	0%	0%
30-34	0	64	0.0000	0.02%	0.03%	0.0	0.0	0%	0%
35-39	0	61	0.0000	0.03%	0.04%	0.0	0.0	0%	0%
40-44	0	67	0.0000	0.04%	0.06%	0.1	0.1	0%	0%
45-49	0	55	0.0000	0.07%	0.08%	0.1	0.1	0%	0%
50-54	0	21	0.0000	0.11%	0.10%	0.0	0.0	0%	0%
55-59	0	2	0.0000	0.16%	0.14%	0.0	0.0	0%	0%
60-64	0	3	0.0000	0.24%	0.19%	0.0	0.0	0%	0%
65-69	0	0	N/A	0.39%	0.30%	-	-	0%	0%
70-74	0	0	N/A	0.68%	0.60%	-	-	0%	0%
Totals	0	298				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

				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	1,318	0.0000	0.02%	0.01%	0.3	0.2	0%	0%
25-29	1	3,946	0.0003	0.04%	0.03%	1.7	1.1	58%	89%
30-34	3	6,216	0.0005	0.08%	0.05%	4.9	3.2	61%	94%
35-39	2	8,520	0.0002	0.10%	0.07%	8.7	5.7	23%	35%
40-44	7	8,328	0.0008	0.15%	0.10%	12.6	8.2	55%	85%
45-49	10	8,356	0.0012	0.23%	0.15%	19.1	12.4	52%	81%
50-54	10	8,085	0.0012	0.30%	0.20%	24.9	16.2	40%	62%
55-59	16	7,662	0.0021	0.48%	0.31%	36.2	23.5	44%	68%
60-64	24	6,344	0.0038	0.59%	0.38%	37.4	24.3	64%	99%
65-69	2	1,716	0.0012	0.63%	0.41%	10.8	7.0	19%	28%
70-74	1	613	0.0016	0.63%	0.41%	3.9	2.5	26%	40%
Totals	76	61,104				161	104	47%	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
FEMALE STATE EMPLOYEES

				Assumed Rate		Expected Disabilities		Actual/Expected	
Age	Actual Disabilities	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20-24	0	1,686	0.0000	0.02%	0.01%	0.3	0.3	0%	0%
25-29	1	5,781	0.0002	0.03%	0.03%	2.1	1.6	47%	61%
30-34	3	7,624	0.0004	0.07%	0.05%	5.1	3.9	59%	77%
35-39	6	10,234	0.0006	0.09%	0.07%	8.9	6.8	67%	88%
40-44	7	12,858	0.0005	0.13%	0.10%	16.7	12.8	42%	55%
45-49	16	15,054	0.0011	0.20%	0.15%	29.2	22.4	55%	72%
50-54	24	16,119	0.0015	0.26%	0.20%	42.4	32.5	57%	74%
55-59	53	18,627	0.0028	0.41%	0.31%	75.1	57.4	71%	92%
60-64	64	15,640	0.0041	0.50%	0.38%	78.2	59.8	82%	107%
65-69	6	3,311	0.0018	0.54%	0.41%	17.7	13.6	34%	44%
70-74	0	694	0.0000	0.54%	0.41%	3.7	2.8	0%	0%
Totals	180	107,628				280	214	64%	84%

*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	1,622	0.0000	0.02%	0.01%	0.4	0.2	0%	0%
25-29	0	3,588	0.0000	0.04%	0.03%	1.6	1.0	0%	0%
30-34	0	5,699	0.0000	0.08%	0.05%	4.5	2.9	0%	0%
35-39	3	7,498	0.0004	0.10%	0.07%	7.7	5.0	39%	60%
40-44	3	7,566	0.0004	0.15%	0.10%	11.5	7.4	26%	40%
45-49	3	6,866	0.0004	0.23%	0.15%	15.6	10.1	19%	30%
50-54	10	6,147	0.0016	0.30%	0.20%	18.9	12.3	53%	81%
55-59	22	5,853	0.0038	0.48%	0.31%	27.7	18.0	79%	122%
60-64	19	4,705	0.0040	0.59%	0.38%	27.7	18.0	69%	106%
65-69	3	1,137	0.0026	0.63%	0.41%	7.2	4.7	42%	64%
70-74	0	240	0.0000	0.63%	0.41%	1.5	1.0	0%	0%
Totals	63	50,921				124	81	51%	78%

*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	1,111	0.0000	0.02%	0.01%	0.2	0.2	0%	0%
25-29	0	3,208	0.0000	0.03%	0.03%	1.2	0.9	0%	0%
30-34	0	4,274	0.0000	0.07%	0.05%	2.8	2.2	0%	0%
35-39	1	5,195	0.0002	0.09%	0.07%	4.5	3.5	22%	29%
40-44	2	5,616	0.0004	0.13%	0.10%	7.3	5.6	28%	36%
45-49	5	5,859	0.0009	0.20%	0.15%	11.3	8.7	44%	58%
50-54	6	5,456	0.0011	0.26%	0.20%	14.3	10.9	42%	55%
55-59	14	5,959	0.0023	0.41%	0.31%	24.0	18.4	58%	76%
60-64	10	5,013	0.0020	0.50%	0.38%	25.1	19.2	40%	52%
65-69	1	1,134	0.0009	0.54%	0.41%	6.1	4.6	16%	22%
70-74	0	227	0.0000	0.54%	0.41%	1.2	0.9	0%	0%
Totals	39	43,052				98	75	40%	52%

*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	415	0.0000	0.01%	0.01%	0.0	0.0	0%	0%
25-29	0	2,791	0.0000	0.02%	0.02%	0.6	0.6	0%	0%
30-34	0	4,679	0.0000	0.04%	0.04%	1.7	1.7	0%	0%
35-39	2	5,783	0.0003	0.05%	0.05%	2.7	2.7	75%	75%
40-44	5	5,556	0.0009	0.07%	0.07%	3.8	3.8	132%	132%
45-49	2	5,343	0.0004	0.10%	0.10%	5.5	5.5	37%	37%
50-54	3	4,532	0.0007	0.14%	0.14%	6.2	6.2	48%	48%
55-59	12	3,178	0.0038	0.22%	0.22%	6.7	6.7	179%	179%
60-64	7	2,015	0.0035	0.27%	0.27%	5.3	5.3	131%	131%
65-69	0	489	0.0000	0.28%	0.28%	1.4	1.4	0%	0%
70-74	0	125	0.0000	0.28%	0.28%	0.4	0.4	0%	0%
Totals	31	34,906				34	34	91%	91%

*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	2,856	0.0000	0.01%	0.01%	0.4	0.4	0%	0%
25-29	0	12,615	0.0000	0.02%	0.02%	3.2	2.6	0%	0%
30-34	5	11,744	0.0004	0.05%	0.04%	5.5	4.6	91%	109%
35-39	5	13,325	0.0004	0.06%	0.05%	8.2	6.8	61%	73%
40-44	4	15,093	0.0003	0.09%	0.08%	13.8	11.5	29%	35%
45-49	10	15,336	0.0007	0.14%	0.12%	20.9	17.4	48%	57%
50-54	20	12,565	0.0016	0.18%	0.15%	23.0	19.2	87%	104%
55-59	20	10,756	0.0019	0.29%	0.24%	30.5	25.4	66%	79%
60-64	23	8,321	0.0028	0.35%	0.30%	29.4	24.5	78%	94%
65-69	0	1,704	0.0000	0.38%	0.32%	6.4	5.4	0%	0%
70-74	1	232	0.0043	0.38%	0.32%	0.9	0.7	114%	137%
Totals	88	104,547				142	119	62%	74%

*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	821	0.0000	0.02%	0.02%	0.3	0.2	0%	0%
25-29	0	4,123	0.0000	0.05%	0.03%	2.2	1.4	0%	0%
30-34	2	6,119	0.0003	0.10%	0.06%	5.8	3.6	35%	55%
35-39	1	7,565	0.0001	0.12%	0.08%	9.3	5.8	11%	17%
40-44	6	6,745	0.0009	0.18%	0.11%	12.1	7.5	50%	79%
45-49	3	3,349	0.0009	0.28%	0.17%	9.0	5.6	33%	53%
50-54	1	1,355	0.0007	0.36%	0.23%	4.9	3.1	20%	33%
55-59	5	726	0.0069	0.58%	0.36%	4.1	2.5	123%	197%
60-64	2	364	0.0055	0.71%	0.44%	2.6	1.6	78%	125%
65-69	0	0	N/A	0.76%	0.47%	0	0	0%	0%
70-74	1	0	N/A	0.76%	0.47%	0	0	0%	0%
Totals	21	31,167				50	31	42%	67%

*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	155	0.0000	0.04%	0.05%	0.1	0.1	0%	0%
25-29	0	684	0.0000	0.08%	0.09%	0.6	0.7	0%	0%
30-34	0	1,387	0.0000	0.17%	0.19%	2.3	2.6	0%	0%
35-39	6	2,229	0.0027	0.21%	0.24%	4.8	5.4	125%	112%
40-44	7	1,976	0.0035	0.32%	0.35%	6.2	6.9	113%	101%
45-49	7	991	0.0071	0.48%	0.54%	4.7	5.2	150%	134%
50-54	2	342	0.0058	0.63%	0.71%	2.2	2.4	93%	83%
55-59	6	154	0.0390	1.01%	1.13%	1.5	1.7	403%	361%
60-64	1	68	0.0147	1.24%	1.39%	0.8	0.9	120%	107%
65-69	0	0	N/A	1.32%	1.48%	0	0	0%	0%
70-74	0	0	N/A	1.32%	1.48%	0	0	0%	0%
Totals	29	7,986				23	26	125%	112%

*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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 54,690	$ 186,833	0.2927	25.00%	27.00%	$ 46,708	$ 50,445	117%	108%
1	64,647	317,736	0.2035	20.00%	20.00%	63,547	63,547	102%	102%
2	41,794	301,284	0.1387	14.00%	12.00%	42,180	36,154	99%	116%
3	31,472	295,010	0.1067	10.00%	10.00%	29,501	29,501	107%	107%
4	28,072	282,260	0.0995	10.00%	9.00%	28,226	25,403	99%	111%
5	22,721	273,686	0.0830	10.00%	8.00%	27,369	21,895	83%	104%
6	20,599	265,840	0.0775	9.00%	7.00%	23,926	18,609	86%	111%
7	16,074	253,733	0.0634	7.50%	6.00%	19,030	15,224	84%	106%
8	13,099	249,970	0.0524	6.00%	5.00%	14,998	12,499	87%	105%
9	13,112	241,517	0.0543	5.50%	5.00%	13,283	12,076	99%	109%
10	11,655	234,217	0.0498	5.00%	4.50%	11,711	10,540	100%	111%
11	12,178	236,912	0.0514	4.50%	4.50%	10,661	10,661	114%	114%
12	10,542	227,789	0.0463	4.00%	4.00%	9,112	9,112	116%	116%
13	8,594	215,896	0.0398	3.75%	3.75%	8,096	8,096	106%	106%
14	8,340	209,863	0.0397	3.50%	3.50%	7,345	7,345	114%	114%
15	6,724	201,924	0.0333	3.00%	3.00%	6,058	6,058	111%	111%
16	5,609	198,075	0.0283	2.75%	2.75%	5,447	5,447	103%	103%
17	5,784	195,054	0.0297	2.50%	2.50%	4,876	4,876	119%	119%
18	4,550	193,129	0.0236	2.00%	2.00%	3,863	3,863	118%	118%
19	4,220	178,452	0.0236	2.00%	2.00%	3,569	3,569	118%	118%
20	4,483	167,836	0.0267	2.00%	2.00%	3,357	3,357	134%	134%
21	4,338	156,663	0.0277	2.00%	2.00%	3,133	3,133	138%	138%
22	2,671	145,614	0.0183	2.00%	2.00%	2,912	2,912	92%	92%
23	2,474	136,523	0.0181	1.50%	1.50%	2,048	2,048	121%	121%
24	3,182	54,392	0.0585	1.50%	1.50%	816	816	390%	390%
Total	$ 401,624	$ 5,420,208				$ 391,772	$ 367,186	103%	109%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 71,833	$ 231,582	0.3102	28.00%	28.00%	$ 64,843	$ 64,843	111%	111%
1	91,357	395,252	0.2311	23.00%	21.00%	90,908	83,003	100%	110%
2	65,525	389,490	0.1682	17.00%	15.00%	66,213	58,424	99%	112%
3	52,210	386,230	0.1352	13.00%	13.00%	50,210	50,210	104%	104%
4	43,516	374,768	0.1161	12.50%	11.00%	46,846	41,225	93%	106%
5	37,717	360,330	0.1047	11.00%	10.00%	39,636	36,033	95%	105%
6	31,204	354,047	0.0881	10.00%	8.50%	35,405	30,094	88%	104%
7	27,131	343,069	0.0791	7.50%	7.25%	25,730	24,872	105%	109%
8	23,453	341,407	0.0687	6.50%	6.25%	22,191	21,338	106%	110%
9	21,064	332,830	0.0633	6.00%	5.75%	19,970	19,138	105%	110%
10	17,879	325,568	0.0549	5.50%	5.25%	17,906	17,092	100%	105%
11	16,694	321,166	0.0520	4.75%	4.50%	15,255	14,452	109%	116%
12	14,396	309,541	0.0465	4.50%	4.25%	13,929	13,156	103%	109%
13	12,444	298,381	0.0417	4.25%	4.00%	12,681	11,935	98%	104%
14	11,833	284,962	0.0415	3.75%	3.75%	10,686	10,686	111%	111%
15	10,653	272,893	0.0390	3.50%	3.50%	9,551	9,551	112%	112%
16	8,753	263,244	0.0333	3.00%	3.00%	7,897	7,897	111%	111%
17	7,200	253,462	0.0284	2.75%	2.75%	6,970	6,970	103%	103%
18	8,366	243,425	0.0344	2.75%	2.75%	6,694	6,694	125%	125%
19	6,270	214,667	0.0292	2.75%	2.75%	5,903	5,903	106%	106%
20	6,796	192,091	0.0354	2.75%	2.75%	5,283	5,283	129%	129%
21	4,644	180,577	0.0257	2.50%	2.50%	4,514	4,514	103%	103%
22	4,093	166,619	0.0246	2.25%	2.25%	3,749	3,749	109%	109%
23	3,554	151,509	0.0235	2.00%	2.00%	3,030	3,030	117%	117%
24	2,689	58,277	0.0461	2.00%	2.00%	1,166	1,166	231%	231%
Total	$ 601,274	$ 7,045,387				$ 587,166	$ 551,258	102%	109%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 33,292	$ 156,738	0.2124	17.00%	18.00%	$ 26,646	$ 28,213	125%	118%
1	41,410	283,084	0.1463	13.00%	13.00%	36,801	36,801	113%	113%
2	27,162	266,223	0.1020	9.00%	9.00%	23,960	23,960	113%	113%
3	24,999	265,537	0.0941	8.00%	8.50%	21,243	22,571	118%	111%
4	20,555	253,573	0.0811	7.50%	7.50%	19,018	19,018	108%	108%
5	16,583	248,187	0.0668	7.00%	7.00%	17,373	17,373	95%	95%
6	15,960	242,987	0.0657	6.50%	6.50%	15,794	15,794	101%	101%
7	13,395	238,839	0.0561	6.00%	5.50%	14,330	13,136	93%	102%
8	12,878	239,818	0.0537	5.50%	5.00%	13,190	11,991	98%	107%
9	10,752	235,290	0.0457	4.75%	4.50%	11,176	10,588	96%	102%
10	9,665	229,660	0.0421	4.50%	4.00%	10,335	9,186	94%	105%
11	8,165	224,604	0.0364	4.00%	3.50%	8,984	7,861	91%	104%
12	8,194	214,506	0.0382	3.50%	3.25%	7,508	6,971	109%	118%
13	6,366	199,602	0.0319	3.00%	3.00%	5,988	5,988	106%	106%
14	5,232	194,260	0.0269	3.00%	3.00%	5,828	5,828	90%	90%
15	5,323	187,301	0.0284	2.75%	2.75%	5,151	5,151	103%	103%
16	5,772	179,683	0.0321	2.75%	2.75%	4,941	4,941	117%	117%
17	4,448	172,812	0.0257	2.75%	2.50%	4,752	4,320	94%	103%
18	4,337	162,011	0.0268	2.50%	2.50%	4,050	4,050	107%	107%
19	3,928	142,059	0.0277	2.50%	2.50%	3,551	3,551	111%	111%
20	3,169	128,987	0.0246	2.00%	2.00%	2,580	2,580	123%	123%
21	2,334	118,266	0.0197	2.00%	2.00%	2,365	2,365	99%	99%
22	2,756	109,553	0.0252	1.75%	1.75%	1,917	1,917	144%	144%
23	1,347	100,130	0.0135	1.50%	1.50%	1,502	1,502	90%	90%
24	1,419	44,047	0.0322	1.25%	1.25%	551	551	258%	258%
Total	$ 289,441	$ 4,837,757				$ 269,534	$ 266,207	107%	109%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 35,431	$ 125,992	0.2812	22.00%	24.00%	$ 27,718	$ 30,238	128%	117%
1	42,965	216,992	0.1980	18.00%	18.00%	39,059	39,059	110%	110%
2	30,125	200,804	0.1500	13.00%	14.00%	26,105	28,113	115%	107%
3	25,776	193,918	0.1329	11.00%	12.00%	21,331	23,270	121%	111%
4	22,156	182,006	0.1217	10.50%	11.00%	19,111	20,021	116%	111%
5	17,578	171,331	0.1026	10.00%	9.50%	17,133	16,276	103%	108%
6	15,017	164,983	0.0910	9.50%	9.00%	15,673	14,848	96%	101%
7	13,688	158,582	0.0863	9.00%	8.00%	14,272	12,687	96%	108%
8	10,935	155,050	0.0705	7.50%	6.50%	11,629	10,078	94%	109%
9	10,589	151,282	0.0700	7.00%	6.50%	10,590	9,833	100%	108%
10	8,888	146,476	0.0607	6.00%	5.50%	8,789	8,056	101%	110%
11	7,655	144,236	0.0531	5.50%	5.00%	7,933	7,212	96%	106%
12	7,130	137,917	0.0517	5.25%	4.75%	7,241	6,551	98%	109%
13	6,437	129,225	0.0498	5.00%	4.50%	6,461	5,815	100%	111%
14	4,900	121,561	0.0403	4.50%	4.00%	5,470	4,862	90%	101%
15	5,073	115,682	0.0439	4.00%	4.00%	4,627	4,627	110%	110%
16	4,514	110,510	0.0408	3.75%	3.75%	4,144	4,144	109%	109%
17	3,737	105,446	0.0354	3.50%	3.50%	3,691	3,691	101%	101%
18	2,852	99,341	0.0287	3.00%	3.00%	2,980	2,980	96%	96%
19	3,053	87,909	0.0347	3.00%	3.00%	2,637	2,637	116%	116%
20	1,591	73,848	0.0215	2.50%	2.50%	1,846	1,846	86%	86%
21	2,725	68,542	0.0398	2.50%	2.50%	1,714	1,714	159%	159%
22	2,017	61,372	0.0329	2.25%	2.25%	1,381	1,381	146%	146%
23	1,429	53,665	0.0266	2.00%	2.00%	1,073	1,073	133%	133%
24	1,218	22,539	0.0540	2.00%	2.00%	451	451	270%	270%
Total	$ 287,479	$ 3,199,209				$ 263,059	$ 261,463	109%	110%

*$ 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 Count	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	$ 23,524	$ 119,234	0.1973	14.00%	16.00%	$ 16,693	$ 19,077	141%	123%
1	25,278	185,460	0.1363	11.00%	12.00%	20,401	22,255	124%	114%
2	16,073	167,577	0.0959	8.00%	8.50%	13,406	14,244	120%	113%
3	11,941	156,954	0.0761	7.00%	7.00%	10,987	10,987	109%	109%
4	11,007	151,122	0.0728	6.50%	6.50%	9,823	9,823	112%	112%
5	10,235	149,712	0.0684	6.00%	6.00%	8,983	8,983	114%	114%
6	7,662	148,277	0.0517	5.50%	5.50%	8,155	8,155	94%	94%
7	5,719	146,508	0.0390	4.00%	4.50%	5,860	6,593	98%	87%
8	6,545	144,322	0.0453	3.50%	4.00%	5,051	5,773	130%	113%
9	5,284	142,910	0.0370	3.00%	3.50%	4,287	5,002	123%	106%
10	4,581	143,280	0.0320	2.75%	3.00%	3,940	4,298	116%	107%
11	4,172	141,023	0.0296	2.50%	2.75%	3,526	3,878	118%	108%
12	4,032	141,461	0.0285	2.50%	2.75%	3,537	3,890	114%	104%
13	3,095	139,619	0.0222	2.25%	2.25%	3,141	3,141	99%	99%
14	3,093	136,904	0.0226	2.00%	2.00%	2,738	2,738	113%	113%
15	2,134	133,180	0.0160	2.00%	2.00%	2,664	2,664	80%	80%
16	2,779	130,466	0.0213	1.75%	2.00%	2,283	2,609	122%	107%
17	2,349	129,312	0.0182	1.75%	2.00%	2,263	2,586	104%	91%
18	2,693	127,720	0.0211	1.75%	2.00%	2,235	2,554	120%	105%
19	1,981	121,046	0.0164	1.50%	1.50%	1,816	1,816	109%	109%
20	1,783	111,666	0.0160	1.00%	1.50%	1,117	1,675	160%	106%
21	2,631	107,726	0.0244	1.00%	1.50%	1,077	1,616	244%	163%
22	1,770	102,794	0.0172	1.00%	1.50%	1,028	1,542	172%	115%
23	2,019	97,288	0.0208	1.00%	1.50%	973	1,459	208%	138%
24	940	33,252	0.0283	1.00%	1.50%	333	499	282%	188%
Total	$ 163,320	$ 3,308,813				$ 136,317	$ 147,857	120%	110%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 61,099	$ 322,639	0.1894	16.00%	17.00%	$ 51,622	$ 54,849	118%	111%
1	83,001	529,667	0.1567	15.00%	14.00%	79,450	74,153	104%	112%
2	64,930	510,423	0.1272	12.00%	11.00%	61,251	56,146	106%	116%
3	55,821	487,162	0.1146	10.00%	10.00%	48,716	48,716	115%	115%
4	45,204	461,885	0.0979	9.00%	9.00%	41,570	41,570	109%	109%
5	37,142	440,175	0.0844	8.00%	8.00%	35,214	35,214	105%	105%
6	30,395	421,603	0.0721	7.50%	7.00%	31,620	29,512	96%	103%
7	22,701	404,933	0.0561	6.00%	5.50%	24,296	22,271	93%	102%
8	19,566	396,320	0.0494	5.00%	4.75%	19,816	18,825	99%	104%
9	17,062	382,294	0.0446	4.50%	4.25%	17,203	16,248	99%	105%
10	15,873	372,197	0.0426	4.00%	4.00%	14,888	14,888	107%	107%
11	12,233	356,151	0.0343	3.50%	3.50%	12,465	12,465	98%	98%
12	11,151	342,898	0.0325	3.25%	3.00%	11,144	10,287	100%	108%
13	9,430	328,379	0.0287	3.00%	2.50%	9,851	8,209	96%	115%
14	6,766	310,486	0.0218	2.50%	2.00%	7,762	6,210	87%	109%
15	6,315	295,684	0.0214	2.25%	2.00%	6,653	5,914	95%	107%
16	5,340	280,464	0.0190	2.00%	1.75%	5,609	4,908	95%	109%
17	5,357	269,935	0.0198	1.75%	1.75%	4,724	4,724	113%	113%
18	5,065	257,240	0.0197	1.50%	1.75%	3,859	4,502	131%	113%
19	3,964	234,104	0.0169	1.25%	1.50%	2,926	3,512	135%	113%
20	3,871	205,896	0.0188	1.25%	1.50%	2,574	3,088	150%	125%
21	3,296	192,165	0.0172	1.25%	1.50%	2,402	2,882	137%	114%
22	2,964	176,535	0.0168	1.25%	1.50%	2,207	2,648	134%	112%
23	2,331	160,714	0.0145	1.25%	1.50%	2,009	2,411	116%	97%
24	1,637	57,674	0.0284	1.25%	1.50%	721	865	227%	189%
Total	$ 532,514	$ 8,197,623				$ 500,552	$ 485,017	106%	110%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	$ 10,246	$ 66,399	0.1543	12.00%	15.00%	$ 7,968	$ 9,960	129%	103%
1	12,458	146,369	0.0851	6.50%	8.00%	9,514	11,710	131%	106%
2	9,551	151,563	0.0630	5.50%	6.50%	8,336	9,852	115%	97%
3	10,074	152,875	0.0659	5.25%	6.00%	8,026	9,172	126%	110%
4	7,994	153,554	0.0521	5.00%	5.00%	7,678	7,678	104%	104%
5	6,780	153,125	0.0443	4.50%	4.50%	6,891	6,891	98%	98%
6	6,759	153,640	0.0440	4.25%	4.00%	6,530	6,146	104%	110%
7	7,553	157,112	0.0481	4.00%	4.00%	6,284	6,284	120%	120%
8	5,758	157,602	0.0365	3.50%	3.50%	5,516	5,516	104%	104%
9	5,188	161,770	0.0321	3.25%	3.00%	5,258	4,853	99%	107%
10	5,188	173,079	0.0300	3.00%	2.50%	5,192	4,327	100%	120%
11	4,553	177,815	0.0256	2.75%	2.50%	4,890	4,445	93%	102%
12	3,990	174,936	0.0228	2.50%	2.00%	4,373	3,499	91%	114%
13	4,102	173,621	0.0236	2.25%	2.00%	3,906	3,472	105%	118%
14	3,193	170,424	0.0187	1.50%	1.75%	2,556	2,982	125%	107%
15	3,485	169,817	0.0205	1.50%	1.75%	2,547	2,972	137%	117%
16	2,305	164,685	0.0140	1.50%	1.50%	2,470	2,470	93%	93%
17	2,972	161,704	0.0184	1.50%	1.50%	2,426	2,426	123%	123%
18	1,270	161,621	0.0079	1.50%	1.50%	2,424	2,424	52%	52%
19	2,734	70,583	0.0387	1.50%	1.50%	1,059	1,059	258%	258%
Total	$ 116,153	$ 3,052,294				$ 103,844	$ 108,138	112%	107%

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

Summary of Data and Experience

TERMINATION EXPERIENCE
FIREFIGHTERS - MALE & FEMALE COMBINED
WEIGHTED BY SALARY

Service	Actual Terminations	Total Count	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	$ 1,514	$ 18,285	0.0828	6.00%	7.00%	$ 1,097	$ 1,280	138%	118%
1	1,640	37,067	0.0442	5.00%	5.50%	1,853	2,039	89%	80%
2	1,535	39,061	0.0393	4.00%	4.00%	1,562	1,562	98%	98%
3	1,510	41,525	0.0364	3.50%	3.50%	1,453	1,453	104%	104%
4	1,311	42,442	0.0309	3.00%	3.00%	1,273	1,273	103%	103%
5	815	42,671	0.0191	2.50%	2.50%	1,067	1,067	76%	76%
6	947	43,298	0.0219	2.25%	2.00%	974	866	97%	109%
7	598	46,565	0.0128	2.00%	1.75%	931	815	64%	73%
8	723	49,910	0.0145	1.75%	1.50%	873	749	83%	97%
9	657	52,544	0.0125	1.50%	1.50%	788	788	83%	83%
10	1,082	56,114	0.0193	1.50%	1.50%	842	842	129%	129%
11	775	55,169	0.0140	1.50%	1.50%	828	828	94%	94%
12	1,095	55,314	0.0198	0.50%	1.00%	277	553	395%	198%
13	351	54,780	0.0064	0.50%	0.50%	274	274	128%	128%
14	127	53,410	0.0024	0.50%	0.50%	267	267	48%	48%
15	540	54,022	0.0100	0.50%	0.50%	270	270	200%	200%
16	267	52,414	0.0051	0.50%	0.50%	262	262	102%	102%
17	732	49,765	0.0147	0.50%	0.50%	249	249	294%	294%
18	285	48,024	0.0059	0.50%	0.50%	240	240	119%	119%
19	551	20,521	0.0269	0.50%	0.50%	103	103	535%	535%
Total	$ 17,055	$ 912,901				$ 15,483	$ 15,780	110%	108%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 431	$ 2,546	0.1693	20.00%	20.00%	$ 509.2	$ 509.2	85%	85%
50	449	2,316	0.1939	15.00%	15.00%	347.4	347.4	129%	129%
51	551	4,787	0.1151	15.00%	15.00%	718.0	718.0	77%	77%
52	760	6,116	0.1243	15.00%	15.00%	917.4	917.4	83%	83%
53	713	8,301	0.0859	15.00%	15.00%	1,245.2	1,245.2	57%	57%
54	1,332	11,820	0.1127	15.00%	15.00%	1,772.9	1,772.9	75%	75%
55	2,103	17,321	0.1214	16.00%	16.00%	2,771.4	2,771.4	76%	76%
56	2,696	22,482	0.1199	16.00%	16.00%	3,597.0	3,597.0	75%	75%
57	3,697	25,746	0.1436	16.00%	16.00%	4,119.4	4,119.4	90%	90%
58	3,717	28,738	0.1293	16.00%	16.00%	4,598.0	4,598.0	81%	81%
59	4,141	29,707	0.1394	16.00%	16.00%	4,753.1	4,753.1	87%	87%
60	3,812	29,171	0.1307	20.00%	20.00%	5,834.1	5,834.1	65%	65%
61	4,464	28,363	0.1574	20.00%	20.00%	5,672.6	5,672.6	79%	79%
62	6,071	28,301	0.2145	30.00%	30.00%	8,490.2	8,490.2	72%	72%
63	7,604	26,115	0.2912	30.00%	30.00%	7,834.4	7,834.4	97%	97%
64	4,687	19,264	0.2433	30.00%	30.00%	5,779.3	5,779.3	81%	81%
65	13,095	62,038	0.2111	22.00%	22.00%	13,648.3	13,648.3	96%	96%
66	13,868	48,596	0.2854	22.00%	22.00%	10,691.2	10,691.2	130%	130%
67	8,549	35,195	0.2429	22.00%	22.00%	7,743.0	7,743.0	110%	110%
68	6,734	26,220	0.2568	22.00%	22.00%	5,768.5	5,768.5	117%	117%
69	3,617	20,179	0.1792	22.00%	22.00%	4,439.4	4,439.4	81%	81%
70	3,806	16,843	0.2260	22.00%	22.00%	3,705.5	3,705.5	103%	103%
71	3,290	11,837	0.2779	22.00%	22.00%	2,604.2	2,604.2	126%	126%
72	2,032	8,983	0.2262	22.00%	22.00%	1,976.2	1,976.2	103%	103%
73	1,238	6,126	0.2021	22.00%	22.00%	1,347.7	1,347.7	92%	92%
74	686	4,583	0.1497	22.00%	22.00%	1,008.3	1,008.3	68%	68%
Subtotal	$ 104,143	$ 531,694				$ 111,892	$ 111,892	93%	93%
75 or more	3,644	17,058	0.2136	100.00%	100.00%	17,057.9	17,057.9	21%	21%
Totals	$ 107,787	$ 548,752				$ 128,950	$ 128,950	84%	84%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 388	$ 35,486	0.0109	2.25%	2.25%	$ 737.1	$ 737.1	53%	53%
50	284	15,786	0.0180	2.25%	2.25%	355.2	355.2	80%	80%
51	208	19,621	0.0106	2.25%	2.25%	441.5	441.5	47%	47%
52	596	22,954	0.0260	2.50%	2.50%	573.8	573.8	104%	104%
53	535	25,924	0.0206	2.50%	2.50%	648.1	648.1	83%	83%
54	746	27,645	0.0270	2.50%	2.50%	691.1	691.1	108%	108%
55	474	27,285	0.0174	2.50%	2.50%	682.1	682.1	69%	69%
56	330	25,932	0.0127	4.00%	2.50%	1,037.3	648.3	32%	51%
57	516	23,906	0.0216	4.00%	2.50%	956.2	597.6	54%	86%
58	398	22,932	0.0174	4.00%	2.50%	917.3	573.3	43%	69%
59	655	21,705	0.0302	5.00%	4.00%	1,085.3	868.2	60%	75%
60	1,634	38,956	0.0419	7.50%	5.00%	2,921.7	1,947.8	56%	84%
61	1,603	37,083	0.0432	7.50%	5.00%	2,781.2	1,854.2	58%	86%
62	6,166	60,390	0.1021	13.00%	11.00%	7,850.7	6,642.9	79%	93%
63	5,503	51,452	0.1070	13.00%	11.00%	6,688.8	5,659.7	82%	97%
64	4,127	45,146	0.0914	13.00%	11.00%	5,869.0	4,966.1	70%	83%
Totals	$ 24,163	$ 502,203				$ 34,236	$ 27,887	71%	87%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 106	$ 1,914	0.0554	17.00%	17.00%	$ 325.4	$ 325.4	33%	33%
50	242	3,048	0.0794	17.00%	17.00%	518.2	518.2	47%	47%
51	683	5,200	0.1313	16.00%	16.00%	832.0	832.0	82%	82%
52	1,093	8,651	0.1263	16.00%	16.00%	1,384.1	1,384.1	79%	79%
53	1,573	13,427	0.1172	16.00%	16.00%	2,148.3	2,148.3	73%	73%
54	1,446	14,100	0.1026	16.00%	16.00%	2,256.0	2,256.0	64%	64%
55	2,750	16,827	0.1634	16.00%	16.00%	2,692.4	2,692.4	102%	102%
56	2,604	18,358	0.1418	16.00%	16.00%	2,937.3	2,937.3	89%	89%
57	2,214	19,947	0.1110	16.00%	16.00%	3,191.5	3,191.5	69%	69%
58	4,053	21,465	0.1888	20.00%	20.00%	4,292.9	4,292.9	94%	94%
59	3,638	21,982	0.1655	20.00%	20.00%	4,396.4	4,396.4	83%	83%
60	4,970	24,050	0.2067	25.00%	25.00%	6,012.5	6,012.5	83%	83%
61	4,672	24,394	0.1915	25.00%	25.00%	6,098.4	6,098.4	77%	77%
62	6,463	24,032	0.2689	33.00%	33.00%	7,930.5	7,930.5	81%	81%
63	7,020	22,713	0.3091	33.00%	33.00%	7,495.4	7,495.4	94%	94%
64	5,645	18,046	0.3128	33.00%	33.00%	5,955.3	5,955.3	95%	95%
65	22,020	88,222	0.2496	28.00%	28.00%	24,702.2	24,702.2	89%	89%
66	19,657	64,056	0.3069	28.00%	28.00%	17,935.7	17,935.7	110%	110%
67	13,452	44,150	0.3047	28.00%	28.00%	12,362.1	12,362.1	109%	109%
68	6,446	30,670	0.2102	22.00%	22.00%	6,747.3	6,747.3	96%	96%
69	4,774	23,896	0.1998	22.00%	22.00%	5,257.0	5,257.0	91%	91%
70	5,583	17,327	0.3222	22.00%	22.00%	3,812.0	3,812.0	146%	146%
71	3,215	11,647	0.2760	22.00%	22.00%	2,562.4	2,562.4	125%	125%
72	2,305	8,589	0.2684	22.00%	22.00%	1,889.6	1,889.6	122%	122%
73	1,035	5,933	0.1744	22.00%	22.00%	1,305.2	1,305.2	79%	79%
74	1,170	4,495	0.2603	22.00%	22.00%	988.8	988.8	118%	118%
Subtotal	$ 128,829	$ 557,139				$ 136,029	$ 136,029	95%	95%
75 or more	2,489	11,340	0.2195	100.00%	100.00%	11,340.2	11,340.2	22%	22%
Totals	$ 131,318	$ 568,479				$ 147,369	$ 147,369	89%	89%

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

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE STATE EMPLOYEES
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 138	$ 45,538	0.0030	2.00%	2.00%	$ 911	$ 911	15%	15%
50	267	19,108	0.0140	2.50%	2.00%	477.7	382.2	56%	70%
51	326	19,767	0.0165	2.50%	2.00%	494.2	395.3	66%	82%
52	273	22,033	0.0124	2.50%	2.00%	550.8	440.7	50%	62%
53	492	20,969	0.0235	2.50%	2.00%	524.2	419.4	94%	117%
54	169	20,526	0.0082	2.50%	2.00%	513.2	410.5	33%	41%
55	644	22,644	0.0284	4.00%	4.00%	905.8	905.8	71%	71%
56	548	25,236	0.0217	4.00%	4.00%	1,009.4	1,009.4	54%	54%
57	607	25,892	0.0234	4.00%	4.00%	1,035.7	1,035.7	59%	59%
58	788	27,747	0.0284	4.00%	4.00%	1,109.9	1,109.9	71%	71%
59	1,363	28,543	0.0478	4.00%	4.00%	1,141.7	1,141.7	119%	119%
60	4,384	64,118	0.0684	10.00%	9.00%	6,411.8	5,770.6	68%	76%
61	4,906	61,343	0.0800	10.00%	9.00%	6,134.3	5,520.9	80%	89%
62	14,660	110,230	0.1330	16.00%	14.00%	17,636.7	15,432.1	83%	95%
63	12,894	95,974	0.1343	16.00%	14.00%	15,355.8	13,436.3	84%	96%
64	9,438	79,591	0.1186	16.00%	14.00%	12,734.6	11,142.8	74%	85%
Totals	$ 51,897	$ 689,259				$ 66,947	$ 59,464	78%	87%

*$ in thousands

*Column may not add due to rounding.

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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ 467	$ 1,933	0.2416	15.00%	15.00%	$ 289.9	$ 289.9	161%	161%
50	271	3,259	0.0832	15.00%	15.00%	488.9	488.9	55%	55%
51	458	3,684	0.1243	15.00%	15.00%	552.6	552.6	83%	83%
52	494	5,379	0.0918	15.00%	15.00%	806.9	806.9	61%	61%
53	932	8,744	0.1066	15.00%	15.00%	1,311.6	1,311.6	71%	71%
54	792	10,776	0.0735	15.00%	15.00%	1,616.5	1,616.5	49%	49%
55	1,532	12,632	0.1213	15.00%	15.00%	1,894.7	1,894.7	81%	81%
56	1,923	15,779	0.1219	15.00%	15.00%	2,366.8	2,366.8	81%	81%
57	2,262	18,609	0.1216	15.00%	15.00%	2,791.4	2,791.4	81%	81%
58	1,980	19,926	0.0994	15.00%	15.00%	2,988.9	2,988.9	66%	66%
59	2,416	23,161	0.1043	15.00%	15.00%	3,474.1	3,474.1	70%	70%
60	2,245	21,612	0.1039	20.00%	20.00%	4,322.4	4,322.4	52%	52%
61	2,336	21,758	0.1074	20.00%	20.00%	4,351.6	4,351.6	54%	54%
62	3,530	21,618	0.1633	23.00%	23.00%	4,972.2	4,972.2	71%	71%
63	4,168	19,824	0.2103	23.00%	23.00%	4,559.4	4,559.4	91%	91%
64	3,914	16,628	0.2354	23.00%	23.00%	3,824.3	3,824.3	102%	102%
65	11,102	48,602	0.2284	23.00%	23.00%	11,178.5	11,178.5	99%	99%
66	10,958	35,735	0.3066	30.00%	23.00%	10,720.4	8,218.9	102%	133%
67	8,219	24,573	0.3345	22.00%	22.00%	5,406.1	5,406.1	152%	152%
68	4,822	15,940	0.3025	22.00%	22.00%	3,506.8	3,506.8	138%	138%
69	1,678	10,961	0.1531	22.00%	22.00%	2,411.5	2,411.5	70%	70%
70	2,200	9,246	0.2379	22.00%	22.00%	2,034.2	2,034.2	108%	108%
71	1,816	7,636	0.2378	18.00%	22.00%	1,374.4	1,679.9	132%	108%
72	1,004	5,368	0.1870	18.00%	22.00%	966.2	1,180.9	104%	85%
73	914	4,212	0.2170	18.00%	22.00%	758.2	926.7	121%	99%
74	641	2,715	0.2361	18.00%	22.00%	488.7	597.3	131%	107%
Subtotal	$ 73,074	$ 390,310				$ 79,457	$ 77,753	92%	94%
75 or more	2,517	7,880	0.3194	100.00%	100.00%	7,880.3	7,880.3	32%	32%
Totals	$ 75,591	$ 398,190				$ 87,338	$ 85,633	87%	88%

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

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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 506	$ 27,270	0.0186	2.50%	2.50%	$ 681.8	$ 681.8	74%	74%
50	228	8,961	0.0254	2.50%	2.50%	224.0	224.0	102%	102%
51	171	11,523	0.0148	2.50%	2.50%	288.1	288.1	59%	59%
52	392	12,618	0.0311	2.50%	2.50%	315.4	315.4	124%	124%
53	487	13,130	0.0371	2.50%	2.50%	328.3	328.3	148%	148%
54	590	16,159	0.0365	2.50%	2.50%	404.0	404.0	146%	146%
55	460	18,457	0.0249	3.00%	3.00%	553.7	553.7	83%	83%
56	289	17,374	0.0166	3.00%	3.00%	521.2	521.2	55%	55%
57	230	18,052	0.0127	3.00%	3.00%	541.6	541.6	42%	42%
58	100	16,800	0.0060	5.00%	4.00%	840.0	672.0	12%	15%
59	564	13,139	0.0429	5.00%	4.00%	657.0	525.6	86%	107%
60	709	26,873	0.0264	5.00%	4.00%	1,343.6	1,074.9	53%	66%
61	1,086	25,584	0.0424	5.00%	4.00%	1,279.2	1,023.4	85%	106%
62	4,251	49,666	0.0856	11.00%	10.00%	5,463.2	4,966.6	78%	86%
63	4,071	43,162	0.0943	11.00%	10.00%	4,747.8	4,316.2	86%	94%
64	2,877	35,580	0.0809	11.00%	10.00%	3,913.8	3,558.0	74%	81%
Totals	$ 17,011	$ 354,348				$ 22,103	$ 19,995	77%	85%

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

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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ -	$ 599	0.0000	20.00%	12.00%	$ 119.7	$ 71.8	0%	0%
50	107	967	0.1107	20.00%	12.00%	193.3	116.0	55%	92%
51	121	1,750	0.0691	20.00%	12.00%	350.1	210.0	35%	58%
52	230	2,574	0.0894	20.00%	12.00%	514.9	308.9	45%	74%
53	745	3,721	0.2002	20.00%	12.00%	744.1	446.5	100%	167%
54	246	4,014	0.0613	20.00%	12.00%	802.9	481.7	31%	51%
55	716	4,729	0.1514	25.00%	15.00%	1,182.3	709.4	61%	101%
56	682	5,906	0.1155	25.00%	15.00%	1,476.5	885.9	46%	77%
57	706	7,223	0.0977	25.00%	15.00%	1,805.9	1,083.5	39%	65%
58	1,012	7,550	0.1340	25.00%	15.00%	1,887.4	1,132.4	54%	89%
59	1,150	6,678	0.1722	25.00%	20.00%	1,669.6	1,335.7	69%	86%
60	1,324	6,884	0.1923	30.00%	20.00%	2,065.2	1,376.8	64%	96%
61	1,060	7,440	0.1425	30.00%	20.00%	2,232.0	1,488.0	47%	71%
62	2,137	8,184	0.2611	30.00%	28.00%	2,455.3	2,291.6	87%	93%
63	1,820	6,737	0.2701	30.00%	28.00%	2,021.2	1,886.4	90%	96%
64	1,335	6,340	0.2106	30.00%	28.00%	1,902.1	1,775.3	70%	75%
65	9,002	33,717	0.2670	25.00%	28.00%	8,429.3	9,440.8	107%	95%
66	7,396	24,799	0.2982	25.00%	28.00%	6,199.8	6,943.8	119%	107%
67	4,663	17,046	0.2736	25.00%	28.00%	4,261.4	4,772.8	109%	98%
68	3,221	12,983	0.2481	25.00%	28.00%	3,245.8	3,635.3	99%	89%
69	2,490	9,481	0.2626	25.00%	28.00%	2,370.2	2,654.6	105%	94%
70	2,059	6,755	0.3048	20.00%	30.00%	1,350.9	2,026.4	152%	102%
71	1,550	5,185	0.2989	15.00%	30.00%	777.7	1,555.4	199%	100%
72	1,112	3,123	0.3561	15.00%	30.00%	468.4	936.9	237%	119%
73	410	1,664	0.2464	15.00%	25.00%	249.6	416.1	164%	99%
74	149	1,116	0.1335	15.00%	25.00%	167.4	279.1	89%	53%
Subtotal	$ 45,443	$ 197,165				$ 48,943	$ 48,261	93%	94%
75 or more	1,041	6,009	0.1732	100.00%	100.00%	6,008.7	6,008.7	17%	17%
Totals	$ 46,484	$ 203,174				$ 54,952	$ 54,270	85%	86%

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

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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 756	$ 18,868	0.0401	3.00%	3.00%	$ 566	$ 566	134%	134%
50	174	6,943	0.0251	4.00%	4.00%	277.7	277.7	63%	63%
51	229	6,397	0.0358	4.00%	4.00%	255.9	255.9	89%	89%
52	35	6,476	0.0054	4.00%	4.00%	259.0	259.0	14%	14%
53	104	5,652	0.0184	4.00%	4.00%	226.1	226.1	46%	46%
54	416	6,269	0.0664	4.00%	4.00%	250.7	250.7	166%	166%
55	36	7,406	0.0049	4.00%	4.00%	296.2	296.2	12%	12%
56	131	7,444	0.0176	4.00%	4.00%	297.8	297.8	44%	44%
57	61	7,675	0.0079	4.00%	4.00%	307.0	307.0	20%	20%
58	349	8,151	0.0428	6.00%	6.00%	489.0	489.0	71%	71%
59	565	7,956	0.0710	6.00%	6.00%	477.3	477.3	118%	118%
60	1,396	20,103	0.0694	10.00%	10.00%	2,010.3	2,010.3	69%	69%
61	1,993	20,212	0.0986	13.00%	13.00%	2,627.5	2,627.5	76%	76%
62	4,335	39,184	0.1106	13.00%	13.00%	5,094.0	5,094.0	85%	85%
63	4,751	35,065	0.1355	13.00%	13.00%	4,558.5	4,558.5	104%	104%
64	4,071	30,794	0.1322	13.00%	13.00%	4,003.2	4,003.2	102%	102%
Totals	$ 19,402	$ 234,595				$ 21,996	$ 21,996	88%	88%

*$ in thousands

*Column may not add due to rounding.

Summary of Data and Experience

UNREDUCED RETIREMENT EXPERIENCE
MALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ -	$ 71	0.0000	20.00%	20.00%	$ 14.2	$ 14.2	0%	0%
50	-	-	N/A	20.00%	20.00%	-	-	0%	0%
51	-	24	0.0000	20.00%	20.00%	4.9	4.9	0%	0%
52	170	696	0.2443	20.00%	20.00%	139.2	139.2	122%	122%
53	302	1,644	0.1837	20.00%	20.00%	328.7	328.7	92%	92%
54	784	4,964	0.1579	15.00%	15.00%	744.6	744.6	105%	105%
55	2,050	12,085	0.1696	15.00%	15.00%	1,812.7	1,812.7	113%	113%
56	1,886	14,777	0.1276	15.00%	15.00%	2,216.6	2,216.6	85%	85%
57	2,640	18,813	0.1403	15.00%	15.00%	2,822.0	2,822.0	94%	94%
58	2,646	19,211	0.1377	15.00%	15.00%	2,881.7	2,881.7	92%	92%
59	3,040	19,514	0.1558	15.00%	15.00%	2,927.1	2,927.1	104%	104%
60	3,050	19,692	0.1549	23.00%	23.00%	4,529.1	4,529.1	67%	67%
61	4,035	19,397	0.2080	23.00%	23.00%	4,461.2	4,461.2	90%	90%
62	5,765	17,694	0.3258	33.00%	33.00%	5,838.9	5,838.9	99%	99%
63	3,892	13,716	0.2838	33.00%	33.00%	4,526.4	4,526.4	86%	86%
64	2,950	10,908	0.2704	33.00%	33.00%	3,599.6	3,599.6	82%	82%
65	6,454	21,655	0.2980	33.00%	33.00%	7,146.1	7,146.1	90%	90%
66	5,413	16,833	0.3216	33.00%	33.00%	5,555.0	5,555.0	97%	97%
67	2,686	11,622	0.2311	30.00%	30.00%	3,486.7	3,486.7	77%	77%
68	2,808	8,672	0.3238	30.00%	30.00%	2,601.6	2,601.6	108%	108%
69	1,730	6,300	0.2746	25.00%	25.00%	1,575.1	1,575.1	110%	110%
70	1,406	4,868	0.2888	20.00%	20.00%	973.6	973.6	144%	144%
71	873	3,134	0.2786	20.00%	20.00%	626.8	626.8	139%	139%
72	347	2,280	0.1522	20.00%	20.00%	455.9	455.9	76%	76%
73	276	1,725	0.1600	20.00%	20.00%	344.9	344.9	80%	80%
74	91	1,163	0.0782	20.00%	20.00%	232.5	232.5	39%	39%
Subtotal	$ 55,294	$ 251,458				$ 59,845	$ 59,845	92%	92%
75 or more	701	2,712	0.2585	100.00%	100.00%	2,712.4	2,712.4	26%	26%
Totals	$ 55,995	$ 254,170				$ 62,558	$ 62,558	90%	90%

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

Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
MALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ -	$ 9,857	0.0000	2.00%	1.00%	$ 197.1	$ 99	0%	0%
50	122	11,701	0.0104	2.00%	2.00%	234.0	234.0	52%	52%
51	181	17,981	0.0101	2.00%	2.00%	359.6	359.6	50%	50%
52	148	23,152	0.0064	2.00%	2.00%	463.0	463.0	32%	32%
53	580	27,834	0.0208	2.50%	2.00%	695.8	556.7	83%	104%
54	436	27,249	0.0160	2.50%	2.00%	681.2	545.0	64%	80%
55	373	20,404	0.0183	2.75%	2.00%	561.1	408.1	66%	91%
56	423	18,914	0.0224	2.75%	2.50%	520.1	472.9	81%	89%
57	123	14,094	0.0087	3.50%	3.00%	493.3	422.8	25%	29%
58	276	12,920	0.0214	3.50%	3.00%	452.2	387.6	61%	71%
59	384	12,162	0.0316	3.50%	3.00%	425.7	364.9	90%	105%
60	1,206	16,757	0.0720	10.00%	8.00%	1,675.7	1,340.5	72%	90%
61	1,089	15,357	0.0709	10.00%	8.00%	1,535.7	1,228.6	71%	89%
62	2,696	21,324	0.1264	13.00%	13.00%	2,772.1	2,772.1	97%	97%
63	1,609	16,997	0.0947	13.00%	13.00%	2,209.7	2,209.7	73%	73%
64	1,860	14,871	0.1251	13.00%	13.00%	1,933.2	1,933.2	96%	96%
Totals	$ 11,506	$ 281,574				$ 15,210	$ 13,797	76%	83%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	$ -	$ 330	0.0000	30.00%	30.00%	$ 99.0	$ 99.0	0%	0%
50	68	127	0.5354	30.00%	30.00%	38.2	38.2	178%	178%
51	254	999	0.2543	30.00%	30.00%	299.8	299.8	85%	85%
52	1,401	6,637	0.2111	30.00%	30.00%	1,991.0	1,991.0	70%	70%
53	2,718	14,307	0.1900	14.00%	14.00%	2,002.9	2,002.9	136%	136%
54	1,973	22,469	0.0878	14.00%	14.00%	3,145.6	3,145.6	63%	63%
55	2,925	27,272	0.1073	14.00%	14.00%	3,818.1	3,818.1	77%	77%
56	3,977	30,400	0.1308	18.00%	18.00%	5,472.0	5,472.0	73%	73%
57	4,932	31,154	0.1583	18.00%	18.00%	5,607.7	5,607.7	88%	88%
58	6,283	31,482	0.1996	18.00%	18.00%	5,666.7	5,666.7	111%	111%
59	4,529	28,937	0.1565	18.00%	18.00%	5,208.7	5,208.7	87%	87%
60	7,019	28,724	0.2444	30.00%	30.00%	8,617.1	8,617.1	81%	81%
61	7,097	25,900	0.2740	30.00%	30.00%	7,770.1	7,770.1	91%	91%
62	7,836	22,443	0.3492	35.00%	35.00%	7,855.2	7,855.2	100%	100%
63	5,929	17,019	0.3484	35.00%	35.00%	5,956.6	5,956.6	100%	100%
64	5,680	14,921	0.3807	35.00%	35.00%	5,222.5	5,222.5	109%	109%
65	21,679	70,264	0.3085	35.00%	35.00%	24,592.3	24,592.3	88%	88%
66	20,331	51,491	0.3948	35.00%	35.00%	18,021.7	18,021.7	113%	113%
67	10,221	33,042	0.3093	35.00%	35.00%	11,564.8	11,564.8	88%	88%
68	7,004	24,187	0.2896	23.00%	28.00%	5,563.1	6,772.5	126%	103%
69	4,576	16,032	0.2854	23.00%	28.00%	3,687.4	4,489.0	124%	102%
70	4,114	11,414	0.3604	23.00%	28.00%	2,625.2	3,195.9	157%	129%
71	1,820	6,510	0.2796	23.00%	28.00%	1,497.3	1,822.8	122%	100%
72	1,098	4,367	0.2514	23.00%	28.00%	1,004.4	1,222.7	109%	90%
73	845	2,933	0.2881	23.00%	28.00%	674.6	821.2	125%	103%
74	681	1,610	0.4230	23.00%	28.00%	370.3	450.8	184%	151%
Subtotal	$ 134,990	$ 524,971				$ 138,372	$ 141,725	98%	95%
75 or more	1,190	4,161	0.2860	100.00%	100.00%	4,161.0	4,161.0	29%	29%
Totals	$ 136,180	$ 529,132				$ 142,533	$ 145,886	96%	93%

*$ in thousands
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Summary of Data and Experience

REDUCED RETIREMENT EXPERIENCE
FEMALE EDUCATORS
WEIGHTED BY SALARY

				Assumed Rate		Expected Retirements		Actual/Expected	
Age	Actual Retirements	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 49	$ 166	$ 49,344	0.0034	2.00%	2.00%	$ 986.9	$ 986.9	17%	17%
50	195	29,091	0.0067	2.00%	2.00%	581.8	581.8	34%	34%
51	374	36,761	0.0102	2.00%	2.00%	735.2	735.2	51%	51%
52	586	35,659	0.0164	3.00%	2.00%	1,069.8	713.2	55%	82%
53	318	29,213	0.0109	3.00%	2.00%	876.4	584.3	36%	54%
54	515	25,279	0.0204	3.00%	2.00%	758.4	505.6	68%	102%
55	227	23,680	0.0096	4.00%	3.00%	947.2	710.4	24%	32%
56	639	22,147	0.0289	4.00%	3.00%	885.9	664.4	72%	96%
57	1,058	21,911	0.0483	7.00%	6.00%	1,533.8	1,314.7	69%	80%
58	1,008	22,154	0.0455	7.00%	6.00%	1,550.8	1,329.2	65%	76%
59	1,018	21,522	0.0473	7.00%	6.00%	1,506.6	1,291.3	68%	79%
60	4,640	52,023	0.0892	11.00%	11.00%	5,722.6	5,722.6	81%	81%
61	5,500	49,964	0.1101	11.00%	11.00%	5,496.1	5,496.1	100%	100%
62	12,241	90,849	0.1347	18.00%	16.00%	16,352.8	14,535.8	75%	84%
63	11,200	76,237	0.1469	18.00%	16.00%	13,722.6	12,197.9	82%	92%
64	9,821	65,867	0.1491	18.00%	16.00%	11,856.1	10,538.8	83%	93%
Totals	$ 49,506	$ 651,701				$ 64,583	$ 57,908	77%	85%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
60	$ 719	$ 4,564	0.1575	12.00%	14.00%	$ 547.7	$ 638.9	131%	113%
61	305	3,647	0.0836	12.00%	14.00%	437.6	510.5	70%	60%
62	310	3,164	0.0980	12.00%	14.00%	379.6	442.9	82%	70%
63	461	2,704	0.1705	12.00%	14.00%	324.5	378.6	142%	122%
64	409	2,417	0.1692	12.00%	14.00%	290.1	338.4	141%	121%
65	589	1,911	0.3082	25.00%	28.00%	477.6	534.9	123%	110%
66	241	1,451	0.1661	25.00%	28.00%	362.7	406.2	66%	59%
67	398	1,235	0.3223	25.00%	28.00%	308.7	345.7	129%	115%
68	299	871	0.3433	25.00%	28.00%	217.9	244.0	137%	123%
69	107	561	0.1907	25.00%	28.00%	140.3	157.1	76%	68%
Subtotal	$ 3,838	$ 22,525				$ 3,487	$ 3,997	110%	96%
70 or more	430	1,091	0.3941	100.00%	100.00%	1,090.8	1,090.8	39%	39%
Totals	$ 4,268	$ 23,616				$ 4,578	$ 5,088	93%	84%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	$ 61	$ 1,536	0.0397	15.00%	15.00%	$ 230.4	$ 230.4	26%	26%
41	1,171	4,853	0.2413	15.00%	15.00%	728.0	728.0	161%	161%
42	2,369	13,405	0.1767	15.00%	15.00%	2,010.8	2,010.8	118%	118%
43	3,748	20,472	0.1831	15.00%	15.00%	3,070.8	3,070.8	122%	122%
44	4,561	26,499	0.1721	15.00%	15.00%	3,974.9	3,974.9	115%	115%
45	4,943	30,676	0.1611	15.00%	15.00%	4,601.3	4,601.3	107%	107%
46	4,973	34,447	0.1444	15.00%	15.00%	5,167.1	5,167.1	96%	96%
47	5,771	37,599	0.1535	15.00%	15.00%	5,639.9	5,639.9	102%	102%
48	5,746	39,405	0.1458	15.00%	15.00%	5,910.7	5,910.7	97%	97%
49	4,784	35,450	0.1350	15.00%	15.00%	5,317.5	5,317.5	90%	90%
50	4,724	33,845	0.1396	15.00%	15.00%	5,076.7	5,076.7	93%	93%
51	4,602	29,678	0.1551	15.00%	15.00%	4,451.7	4,451.7	103%	103%
52	3,021	26,127	0.1156	15.00%	15.00%	3,919.1	3,919.1	77%	77%
53	3,631	23,914	0.1518	15.00%	15.00%	3,587.1	3,587.1	101%	101%
54	2,675	20,860	0.1282	15.00%	15.00%	3,129.0	3,129.0	85%	85%
55	2,712	17,643	0.1537	15.00%	15.00%	2,646.5	2,646.5	102%	102%
56	2,033	14,250	0.1427	15.00%	15.00%	2,137.6	2,137.6	95%	95%
57	1,123	12,711	0.0883	15.00%	15.00%	1,906.6	1,906.6	59%	59%
58	1,719	10,975	0.1566	15.00%	15.00%	1,646.3	1,646.3	104%	104%
59	1,149	8,706	0.1320	15.00%	15.00%	1,306.0	1,306.0	88%	88%
60	894	7,245	0.1234	20.00%	20.00%	1,449.0	1,449.0	62%	62%
61	1,199	6,786	0.1767	20.00%	20.00%	1,357.2	1,357.2	88%	88%
62	1,700	6,062	0.2804	30.00%	30.00%	1,818.6	1,818.6	93%	93%
63	1,175	4,871	0.2412	30.00%	30.00%	1,461.3	1,461.3	80%	80%
64	594	2,373	0.2503	30.00%	30.00%	711.9	711.9	83%	83%
65	499	2,151	0.2320	30.00%	30.00%	645.2	645.2	77%	77%
66	387	1,505	0.2571	30.00%	30.00%	451.4	451.4	86%	86%
67	481	910	0.5286	30.00%	30.00%	273.0	273.0	176%	176%
68	188	620	0.3032	30.00%	30.00%	185.9	185.9	101%	101%
69	123	388	0.3170	30.00%	30.00%	116.5	116.5	106%	106%
Subtotal	$ 72,756	$ 475,962				$ 74,928	$ 74,928	97%	97%
70 or more	312	702	0.4444	100.00%	100.00%	702.2	702.2	44%	44%
Totals	$ 73,068	$ 476,664				$ 75,630	$ 75,630	97%	97%

*$ 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 Count	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%	15.00%	$ -	$ -	0%	0%
46	0	0	N/A	15.00%	15.00%	0.0	0.0	0%	0%
47	0	0	N/A	15.00%	15.00%	0.0	0.0	0%	0%
48	0	70	0.0000	15.00%	15.00%	10.6	10.6	0%	0%
49	55	197	0.2792	15.00%	15.00%	29.5	29.5	186%	186%
50	0	359	0.0000	15.00%	15.00%	53.9	53.9	0%	0%
51	149	952	0.1565	15.00%	15.00%	142.7	142.7	104%	104%
52	399	3,091	0.1291	15.00%	15.00%	463.6	463.6	86%	86%
53	1,062	4,438	0.2393	15.00%	15.00%	665.7	665.7	160%	160%
54	762	4,463	0.1707	15.00%	15.00%	669.5	669.5	114%	114%
55	893	5,248	0.1702	15.00%	15.00%	787.3	787.3	113%	113%
56	490	5,404	0.0907	15.00%	15.00%	810.6	810.6	60%	60%
57	720	5,724	0.1258	15.00%	15.00%	858.7	858.7	84%	84%
58	1,106	5,626	0.1966	15.00%	15.00%	843.9	843.9	131%	131%
59	636	5,436	0.1170	20.00%	20.00%	1087.3	1087.3	58%	58%
60	905	5,326	0.1699	20.00%	20.00%	1065.1	1065.1	85%	85%
61	788	5,125	0.1538	20.00%	20.00%	1024.9	1024.9	77%	77%
62	1,107	4,584	0.2415	35.00%	30.00%	1604.4	1375.2	69%	80%
63	821	3,655	0.2246	35.00%	30.00%	1279.3	1096.6	64%	75%
64	900	3,295	0.2731	35.00%	30.00%	1153.3	988.5	78%	91%
65	530	2,179	0.2432	35.00%	30.00%	762.7	653.7	69%	81%
66	483	1,496	0.3229	50.00%	40.00%	747.8	598.3	65%	81%
67	436	847	0.5148	50.00%	50.00%	423.7	423.7	103%	103%
68	107	554	0.1931	50.00%	50.00%	277.1	277.1	39%	39%
69	155	385	0.4026	50.00%	50.00%	192.6	192.6	80%	80%
Subtotal	$ 12,504	$ 68,454				$ 14,954	$ 14,119	84%	89%
70 or more	84	619	0.1357	100.00%	100.00%	618.7	618.7	14%	14%
Totals	$ 12,588	$ 69,073				$ 15,573	$ 14,738	81%	85%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40	$ 52	$ 510	0.1020	10.00%	7.50%	$ 51.0	$ 38.3	102%	136%
41	0	1,101	0.0000	10.00%	7.50%	110.1	82.6	0%	0%
42	218	2,527	0.0863	10.00%	7.50%	252.7	189.5	86%	115%
43	524	4,149	0.1263	10.00%	7.50%	414.9	311.2	126%	168%
44	494	5,964	0.0828	10.00%	7.50%	596.4	447.3	83%	110%
45	440	8,376	0.0525	10.00%	7.50%	837.6	628.2	53%	70%
46	738	10,542	0.0700	10.00%	7.50%	1,054.2	790.7	70%	93%
47	562	11,398	0.0493	5.00%	7.50%	569.9	854.8	99%	66%
48	306	12,372	0.0247	5.00%	7.50%	618.6	927.9	49%	33%
49	1,363	11,375	0.1198	5.00%	7.50%	568.7	853.1	240%	160%
50	1,230	10,480	0.1174	5.00%	7.50%	524.0	786.0	235%	156%
51	658	9,639	0.0683	5.00%	7.50%	481.9	722.9	137%	91%
52	709	9,787	0.0724	5.00%	7.50%	489.4	734.0	145%	97%
53	749	8,796	0.0852	10.00%	7.50%	879.6	659.7	85%	114%
54	707	7,818	0.0904	10.00%	7.50%	781.8	586.3	90%	121%
55	373	6,965	0.0536	10.00%	7.50%	696.5	522.4	54%	71%
56	293	5,646	0.0519	10.00%	7.50%	564.6	423.4	52%	69%
57	753	4,416	0.1705	10.00%	15.00%	441.6	662.3	171%	114%
58	573	4,285	0.1337	10.00%	15.00%	428.5	642.8	134%	89%
59	374	3,350	0.1116	10.00%	15.00%	335.0	502.5	112%	74%
60	375	3,478	0.1078	10.00%	15.00%	347.8	521.7	108%	72%
61	389	3,102	0.1254	10.00%	15.00%	310.2	465.3	125%	84%
62	249	2,573	0.0968	25.00%	25.00%	643.3	643.3	39%	39%
63	225	2,110	0.1066	25.00%	25.00%	527.4	527.4	43%	43%
64	475	1,392	0.3412	25.00%	25.00%	348.0	348.0	136%	136%
65	0	457	0.0000	50.00%	50.00%	228.7	228.7	0%	0%
66	185	464	0.3987	50.00%	50.00%	232.1	232.1	80%	80%
67	122	349	0.3496	50.00%	50.00%	174.3	174.3	70%	70%
68	0	147	0.0000	50.00%	50.00%	73.4	73.4	0%	0%
69	0	0	N/A	50.00%	50.00%	0.0	0.0	0%	0%
Subtotal	$ 13,136	$ 153,568				$ 13,582	$ 14,580	97%	90%
70 or more	52	102	0.5098	100.00%	100.00%	102.1	102.1	51%	51%
Total	$ 13,188	$ 153,670				$ 13,684	$ 14,682	96%	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 Count	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%	15.00%	$ -	$ -	0%	0%
46	0	0	N/A	15.00%	15.00%	0	0	0%	0%
47	0	0	N/A	15.00%	15.00%	0	0	0%	0%
48	0	0	N/A	15.00%	15.00%	0	0	0%	0%
49	0	170	0.0000	15.00%	15.00%	25.5	25.5	0%	0%
50	0	111	0.0000	15.00%	15.00%	16.7	16.7	0%	0%
51	0	243	0.0000	15.00%	15.00%	36.4	36.4	0%	0%
52	0	564	0.0000	15.00%	15.00%	84.6	84.6	0%	0%
53	71	911	0.0779	15.00%	15.00%	136.7	136.7	52%	52%
54	324	1,638	0.1978	15.00%	15.00%	245.6	245.6	132%	132%
55	322	1,483	0.2171	15.00%	15.00%	222.5	222.5	145%	145%
56	349	1,677	0.2081	15.00%	15.00%	251.6	251.6	139%	139%
57	156	1,763	0.0885	15.00%	15.00%	264.4	264.4	59%	59%
58	228	2,275	0.1002	20.00%	20.00%	455.0	455.0	50%	50%
59	332	2,535	0.1310	20.00%	20.00%	506.9	506.9	65%	65%
60	383	2,433	0.1574	20.00%	20.00%	486.6	486.6	79%	79%
61	229	1,972	0.1161	20.00%	20.00%	394.3	394.3	58%	58%
62	651	1,847	0.3525	25.00%	25.00%	461.7	461.7	141%	141%
63	418	1,537	0.2720	25.00%	25.00%	384.3	384.3	109%	109%
64	450	1,690	0.2663	25.00%	25.00%	422.5	422.5	107%	107%
65	787	1,684	0.4673	50.00%	50.00%	842.1	842.1	93%	93%
66	381	1,028	0.3706	50.00%	50.00%	514.0	514.0	74%	74%
67	183	638	0.2868	50.00%	50.00%	319.1	319.1	57%	57%
68	90	387	0.2326	50.00%	50.00%	193.5	193.5	47%	47%
69	161	376	0.4282	50.00%	50.00%	188.2	188.2	86%	86%
Subtotal	$ 5,515	$ 26,962				$ 6,452	$ 6,452	85%	85%
70 or more	81	294	0.2755	100.00%	100.00%	294.1	294.1	28%	28%
Total	$ 5,596	$ 27,256				$ 6,746	$ 6,746	83%	83%

*$ 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 Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
62	$ 155	$ 2,016	0.0769	20.00%	15.00%	$ 403.2	$ 302.4	38%	51%
63	155	1,659	0.0934	20.00%	15.00%	331.8	248.9	47%	62%
64	0	1,533	0.0000	20.00%	15.00%	306.7	230.0	0%	0%
65	161	1,434	0.1123	20.00%	15.00%	286.9	215.2	56%	75%
66	422	1,392	0.3032	20.00%	15.00%	278.4	208.8	152%	202%
67	0	795	0.0000	20.00%	15.00%	159.0	119.3	0%	0%
68	300	457	0.6565	20.00%	15.00%	91.4	68.5	328%	438%
69	0	316	0.0000	20.00%	15.00%	63.2	47.4	0%	0%
Subtotal	$ 1,193	$ 9,602				$ 1,921	$ 1,441	62%	83%
70 or more	458	1,694	0.2704	100.00%	100.00%	1694.4	1694.4	27%	27%
Total	$ 1,651	$ 11,296				$ 3,615	$ 3,135	46%	53%

*$ 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 Count	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	316	0.0000	10.00%	10.00%	31.6	31.6	0%	0%
52	0	613	0.0000	10.00%	10.00%	61.3	61.3	0%	0%
53	0	608	0.0000	10.00%	10.00%	60.8	60.8	0%	0%
54	0	634	0.0000	10.00%	10.00%	63.4	63.4	0%	0%
55	0	330	0.0000	10.00%	10.00%	33.0	33.0	0%	0%
56	0	472	0.0000	10.00%	10.00%	47.2	47.2	0%	0%
57	155	444	0.3491	10.00%	10.00%	44.4	44.4	349%	349%
58	0	442	0.0000	10.00%	10.00%	44.2	44.2	0%	0%
59	0	464	0.0000	10.00%	10.00%	46.4	46.4	0%	0%
60	155	449	0.3452	10.00%	10.00%	44.9	44.9	345%	345%
61	0	615	0.0000	10.00%	10.00%	61.5	61.5	0%	0%
62	0	450	0.0000	10.00%	10.00%	45.0	45.0	0%	0%
63	161	601	0.2679	10.00%	10.00%	60.1	60.1	268%	268%
64	0	460	0.0000	15.00%	20.00%	69.0	91.9	0%	0%
65	299	594	0.5034	15.00%	20.00%	89.1	118.7	336%	252%
66	165	313	0.5272	20.00%	25.00%	62.6	78.2	264%	211%
67	165	165	1.0000	20.00%	25.00%	33.1	41.3	498%	400%
68	0	0	N/A	20.00%	25.00%	0	0	0%	0%
69	0	0	N/A	20.00%	25.00%	0	0	0%	0%
Subtotal	$ 1,100	$ 7,970				$ 898	$ 974	123%	113%
70 or more	0	0	N/A	100.00%	100.00%	0.0	0.0	0%	0%
Total	$ 1,100	$ 7,970				$ 898	$ 974	123%	113%

*$ 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 Count	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	157	0.0000	10.00%	10.00%	15.7	15.7	0%	0%
55	0	317	0.0000	10.00%	10.00%	31.7	31.7	0%	0%
56	0	466	0.0000	10.00%	10.00%	46.6	46.6	0%	0%
57	0	167	0.0000	10.00%	10.00%	16.7	16.7	0%	0%
58	0	0	N/A	10.00%	10.00%	0	0	0%	0%
59	0	294	0.0000	10.00%	10.00%	29.4	29.4	0%	0%
60	161	636	0.2531	10.00%	10.00%	63.6	63.6	253%	253%
61	284	451	0.6297	10.00%	10.00%	45.1	45.1	630%	630%
62	0	580	0.0000	10.00%	10.00%	58.0	58.0	0%	0%
63	0	769	0.0000	10.00%	10.00%	76.9	76.9	0%	0%
64	324	1,104	0.2935	15.00%	20.00%	165.6	220.8	196%	147%
65	464	1,403	0.3307	15.00%	20.00%	210.4	280.5	221%	165%
66	141	632	0.2231	20.00%	25.00%	126.4	158.0	112%	89%
67	160	476	0.3361	20.00%	25.00%	95.2	119.1	168%	134%
68	328	742	0.4420	20.00%	25.00%	148.4	185.4	221%	177%
69	0	581	0.0000	20.00%	25.00%	116.2	145.3	0%	0%
Subtotal	$ 1,862	$ 8,775				$ 1,246	$ 1,493	149%	125%
70 or more	462	2,216	0.2085	100.00%	100.00%	2216.3	2216.3	21%	21%
Total	$ 2,324	$ 10,991				$ 3,462	$ 3,709	67%	63%

*$ 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	6.53%	8.50%	8.25%
1	6.24%	7.75%	7.50%
2	5.38%	6.75%	6.50%
3	5.06%	6.00%	6.00%
4	4.62%	5.75%	5.75%
5	4.40%	5.25%	5.25%
6	4.12%	5.00%	5.00%
7	4.03%	4.75%	4.75%
8	3.80%	4.75%	4.75%
9	3.77%	4.50%	4.50%
10	3.58%	4.50%	4.50%
11	3.44%	4.25%	4.25%
12	3.49%	4.25%	4.25%
13	3.32%	4.25%	4.25%
14	3.11%	4.00%	4.00%
15	3.10%	3.75%	3.75%
16	2.94%	3.75%	3.75%
17	3.03%	3.75%	3.75%
18	2.97%	3.75%	3.75%
19	2.86%	3.75%	3.75%
20	2.83%	3.50%	3.50%
21	2.65%	3.50%	3.50%
22	2.71%	3.50%	3.50%
23	2.65%	3.50%	3.50%
24	2.54%	3.25%	3.25%
25 and up	2.39%	3.25%	3.25%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
LOCAL GOVERNMENT

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	6.59%	8.75%	8.25%
1	6.04%	7.25%	7.00%
2	5.62%	6.50%	6.50%
3	5.17%	6.00%	6.00%
4	4.95%	5.50%	5.50%
5	4.52%	5.25%	5.25%
6	4.43%	5.00%	5.00%
7	4.21%	4.75%	4.75%
8	4.17%	4.50%	4.50%
9	3.86%	4.50%	4.50%
10	3.61%	4.25%	4.25%
11	3.40%	4.00%	4.00%
12	3.39%	4.00%	4.00%
13	3.37%	4.00%	4.00%
14	3.26%	4.00%	4.00%
15	3.36%	4.00%	4.00%
16	3.11%	3.75%	3.75%
17	3.12%	3.75%	3.75%
18	3.10%	3.75%	3.75%
19	2.74%	3.75%	3.50%
20	2.91%	3.50%	3.50%
21	2.94%	3.50%	3.50%
22	2.94%	3.50%	3.50%
23	2.75%	3.25%	3.25%
24	2.64%	3.25%	3.25%
25 and up	2.63%	3.25%	3.25%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
EDUCATORS

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	8.09%	9.75%	9.25%
1	6.80%	9.00%	8.50%
2	6.07%	8.00%	7.50%
3	6.07%	7.50%	7.25%
4	5.98%	7.25%	7.00%
5	5.83%	7.00%	6.75%
6	5.60%	7.00%	6.75%
7	5.68%	6.75%	6.50%
8	5.38%	6.75%	6.50%
9	4.80%	6.50%	6.25%
10	4.76%	6.00%	5.75%
11	4.44%	5.50%	5.50%
12	4.07%	5.25%	5.25%
13	3.75%	4.75%	4.75%
14	3.45%	4.50%	4.50%
15	3.26%	4.25%	4.25%
16	3.12%	4.00%	4.00%
17	2.99%	3.75%	3.75%
18	2.94%	3.75%	3.75%
19	2.98%	3.75%	3.75%
20	2.85%	3.75%	3.75%
21	2.81%	3.75%	3.75%
22	2.77%	3.75%	3.75%
23	2.68%	3.75%	3.50%
24	2.52%	3.50%	3.50%
25 and up	2.38%	3.25%	3.25%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
PUBLIC SAFETY

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	5.14%	7.25%	6.75%
1	5.11%	6.25%	6.00%
2	5.27%	6.00%	6.00%
3	5.17%	5.75%	6.00%
4	5.36%	5.75%	6.00%
5	5.35%	5.75%	6.00%
6	5.20%	5.75%	5.75%
7	4.64%	5.50%	5.50%
8	4.76%	5.25%	5.25%
9	4.60%	5.25%	5.25%
10	4.36%	5.00%	5.00%
11	4.14%	4.75%	4.75%
12	3.81%	4.50%	4.50%
13	3.86%	4.50%	4.50%
14	3.85%	4.25%	4.50%
15	3.76%	4.25%	4.50%
16	3.33%	4.25%	4.25%
17	3.35%	4.00%	4.00%
18	3.31%	4.00%	4.00%
19	3.40%	4.00%	4.00%
20	3.16%	4.00%	4.00%
21	3.04%	3.75%	3.75%
22	2.86%	3.75%	3.75%
23	2.91%	3.50%	3.50%
24	3.10%	3.50%	3.50%
25 and up	2.83%	3.25%	3.25%

Summary of Data and Experience

SALARY INCREASE EXPERIENCE
FIREFIGHTERS

Service Index	Actual Increase	Current Assumption	Proposed Assumption
0	5.79%	8.75%	8.50%
1	5.75%	8.25%	8.00%
2	5.31%	8.00%	7.75%
3	4.99%	7.75%	7.50%
4	6.28%	7.50%	7.50%
5	6.17%	7.25%	7.25%
6	6.14%	7.25%	7.25%
7	5.24%	6.75%	6.75%
8	5.07%	6.50%	6.50%
9	4.92%	6.25%	6.00%
10	4.65%	5.75%	5.50%
11	3.86%	5.00%	5.00%
12	3.56%	5.00%	4.75%
13	3.59%	4.50%	4.50%
14	3.33%	4.50%	4.25%
15	3.02%	4.50%	4.25%
16	3.08%	4.50%	4.25%
17	2.49%	4.25%	4.00%
18	2.86%	4.00%	3.75%
19	2.75%	4.00%	3.75%
20	2.40%	4.00%	3.75%
21	2.45%	3.75%	3.50%
22	2.10%	3.50%	3.50%
23	2.69%	3.50%	3.50%
24	2.32%	3.50%	3.25%
25 and up	2.06%	3.25%	3.25%

APPENDIX A

SUMMARY OF PROPOSED ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Proposed Actuarial Assumptions and Methods

1. *Investment return rate*:

   6.95% 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	0.000130	0.000130	0.000090	0.000150	0.000470
25	0.000195	0.000195	0.000135	0.000225	0.000705
30	0.000390	0.000390	0.000270	0.000450	0.001410
35	0.000585	0.000585	0.000405	0.000675	0.002115
40	0.000780	0.000780	0.000540	0.000900	0.002820
45	0.001300	0.001300	0.000900	0.001500	0.004700
50	0.001690	0.001690	0.001170	0.001950	0.006110
55	0.002665	0.002665	0.001845	0.003075	0.009635
60	0.003640	0.003640	0.002520	0.004200	0.013160

	Active Female Members				
Age	**Local Government**	**Public Employees**	**Public Educators**	**Public Safety**	**Firefighters**
20	0.000130	0.000130	0.000100	0.000150	0.000470
25	0.000195	0.000195	0.000150	0.000225	0.000705
30	0.000390	0.000390	0.000300	0.000450	0.001410
35	0.000585	0.000585	0.000450	0.000675	0.002115
40	0.000780	0.000780	0.000600	0.000900	0.002820
45	0.001300	0.001300	0.001000	0.001500	0.004700
50	0.001690	0.001690	0.001300	0.001950	0.006110
55	0.002665	0.002665	0.002050	0.003075	0.009635
60	0.003640	0.003640	0.002800	0.004200	0.013160

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	0.1800	0.2700	0.1600	0.1500	0.0700
1	0.1300	0.2000	0.1200	0.0800	0.0550
2	0.0900	0.1200	0.0850	0.0650	0.0400
3	0.0850	0.1000	0.0700	0.0600	0.0350
4	0.0750	0.0900	0.0650	0.0500	0.0300
5	0.0700	0.0800	0.0600	0.0450	0.0250
6	0.0650	0.0700	0.0550	0.0400	0.0200
7	0.0550	0.0600	0.0450	0.0400	0.0175
8	0.0500	0.0500	0.0400	0.0350	0.0150
9	0.0450	0.0500	0.0350	0.0300	0.0150
10	0.0400	0.0450	0.0300	0.0250	0.0150
11	0.0350	0.0450	0.0275	0.0250	0.0150
12	0.0325	0.0400	0.0275	0.0200	0.0100
13	0.0300	0.0375	0.0225	0.0200	0.0050
14	0.0300	0.0350	0.0200	0.0175	0.0050
15	0.0275	0.0300	0.0200	0.0175	0.0050
16	0.0275	0.0275	0.0200	0.01500	0.0050
17	0.0250	0.0250	0.0200	0.01500	0.0050
18	0.0250	0.0200	0.0200	0.01500	0.0050
19	0.0250	0.0200	0.0150	0.01500	0.0050
20	0.0200	0.0200	0.0150	0.0100	0.0050
21	0.0200	0.0200	0.0150	0.0100	0.0050
22	0.0175	0.0200	0.0150	0.0100	0.0050
23	0.0150	0.0150	0.0150	0.0100	0.0050
24	0.0125	0.0150	0.0150	0.0100	0.0050
25+	0.0100	0.0100	0.0100	N/A	N/A

Summary of Proposed Actuarial Assumptions and Methods

4. *Termination rates (continued)*:

	Active Female Members				
	Years of Service				
Service	Local Government	Public Employees	Public Educators	Public Safety	Firefighters
0	0.2400	0.2800	0.1700	0.1500	0.0700
1	0.1800	0.2100	0.1400	0.0800	0.0550
2	0.1400	0.1500	0.1100	0.0650	0.0400
3	0.1200	0.1300	0.1000	0.0600	0.0350
4	0.1100	0.1100	0.0900	0.0500	0.0300
5	0.0950	0.1000	0.0800	0.0450	0.0250
6	0.0900	0.0850	0.0700	0.0400	0.0200
7	0.0800	0.0725	0.0550	0.0400	0.0175
8	0.0650	0.0625	0.0475	0.0350	0.0150
9	0.0650	0.0575	0.0425	0.0300	0.0150
10	0.0550	0.0525	0.0400	0.0250	0.0150
11	0.0500	0.0450	0.0350	0.0250	0.0150
12	0.0475	0.0425	0.0300	0.0200	0.0100
13	0.0450	0.0400	0.0250	0.0200	0.0050
14	0.0400	0.0375	0.0200	0.0175	0.0050
15	0.0400	0.0350	0.0200	0.0175	0.0050
16	0.0375	0.0300	0.0175	0.0150	0.0050
17	0.0350	0.0275	0.0175	0.0150	0.0050
18	0.0300	0.0275	0.0175	0.0150	0.0050
19	0.0300	0.0275	0.0150	0.0150	0.0050
20	0.0250	0.0275	0.0150	0.0100	0.0050
21	0.0250	0.0250	0.0150	0.0100	0.0050
22	0.0225	0.0225	0.0150	0.0100	0.0050
23	0.0200	0.0200	0.0150	0.0100	0.0050
24	0.0200	0.0200	0.0150	0.0100	0.0050
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	0.120
51	0.025	0.150	0.040	0.120
52	0.025	0.150	0.040	0.120
53	0.025	0.150	0.040	0.120
54	0.025	0.150	0.040	0.120
55	0.030	0.150	0.040	0.150
56	0.030	0.150	0.040	0.150
57	0.030	0.150	0.040	0.150
58	0.040	0.150	0.060	0.150
59	0.040	0.150	0.060	0.200
60	0.040	0.200	0.100	0.200
61	0.040	0.200	0.130	0.200
62	0.100	0.230	0.130	0.280
63	0.100	0.230	0.130	0.280
64	0.100	0.230	0.130	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

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	0.300
51	0.020	0.200	0.020	0.300
52	0.020	0.200	0.020	0.300
53	0.020	0.200	0.020	0.140
54	0.020	0.150	0.020	0.140
55	0.020	0.150	0.030	0.140
56	0.025	0.150	0.030	0.180
57	0.030	0.150	0.060	0.180
58	0.030	0.150	0.060	0.180
59	0.030	0.150	0.060	0.180
60	0.080	0.230	0.110	0.300
61	0.080	0.230	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	0.280
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

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	0.150	0.150	0.075	0.150
45	0.000	0.150	0.150	0.075	0.150
46	0.000	0.150	0.150	0.075	0.150
47	0.000	0.150	0.150	0.075	0.150
48	0.000	0.150	0.150	0.075	0.150
49	0.000	0.150	0.150	0.075	0.150
50	0.000	0.150	0.150	0.075	0.150
51	0.000	0.150	0.150	0.075	0.150
52	0.000	0.150	0.150	0.075	0.150
53	0.000	0.150	0.150	0.075	0.150
54	0.000	0.150	0.150	0.075	0.150
55	0.000	0.150	0.150	0.075	0.150
56	0.000	0.150	0.150	0.075	0.150
57	0.000	0.150	0.150	0.150	0.150
58	0.000	0.150	0.150	0.150	0.200
59	0.000	0.150	0.200	0.150	0.200
60	0.140	0.200	0.200	0.150	0.200
61	0.140	0.200	0.200	0.150	0.200
62	0.140	0.300	0.300	0.250	0.250
63	0.140	0.300	0.300	0.250	0.250
64	0.140	0.300	0.300	0.250	0.250
65	0.280	0.300	0.300	0.500	0.500
66	0.280	0.300	0.400	0.500	0.500
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	0.150	N/A	N/A	0.075	N/A
45	N/A	0.150	0.150	N/A	0.075	0.150
46	N/A	0.150	0.150	N/A	0.075	0.150
47	N/A	0.150	0.150	N/A	0.075	0.150
48	N/A	0.150	0.150	N/A	0.075	0.150
49	N/A	0.150	0.150	N/A	0.075	0.150
50	N/A	0.150	0.150	N/A	0.075	0.150
51	N/A	0.150	0.150	N/A	0.075	0.150
52	N/A	0.150	0.150	N/A	0.075	0.150
53	N/A	0.150	0.150	N/A	0.075	0.150
54	N/A	0.150	0.150	N/A	0.075	0.150
55	N/A	0.150	0.150	N/A	0.075	0.150
56	N/A	0.150	0.150	N/A	0.075	0.150
57	N/A	0.150	0.150	N/A	0.150	0.150
58	N/A	0.150	0.150	N/A	0.150	0.200
59	N/A	0.150	0.200	N/A	0.150	0.200
60	0.050	0.200	0.200	0.050	0.150	0.200
61	0.050	0.200	0.200	0.050	0.150	0.200
62	0.050	0.300	0.300	0.050	0.250	0.250
63	0.100	0.300	0.300	0.100	0.250	0.250
64	0.100	0.300	0.300	0.100	0.250	0.250
65	0.300	0.300	0.300	0.500	0.500	0.500
66	0.300	0.300	0.400	0.500	0.500	0.500
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 3.25% Wage Inflation**
0	5.00%	8.25%
1	3.75	7.00
2	3.25	6.50
3	2.75	6.00
4	2.25	5.50
5	2.00	5.25
6	1.75	5.00
7	1.50	4.75
8	1.25	4.50
9	1.25	4.50
10	1.00	4.25
11	0.75	4.00
12	0.75	4.00
13	0.75	4.00
14	0.75	4.00
15	0.75	4.00
16	0.50	3.75
17	0.50	3.75
18	0.50	3.75
19	0.25	3.50
20	0.25	3.50
21	0.25	3.50
22	0.25	3.50
23	0.00	3.25
24	0.00	3.25
25 or more	0.00	3.25

Summary of Proposed Actuarial Assumptions and Methods

7. *Salary increase rates (continued)*:

Active Male and Female Members - Public Employees		
Years of Service	**Annual Promotional/Longevity Rates of Increase**	**Total Annual Rate of Increase Including 3.25% Wage Inflation**
0	5.00%	8.25%
1	4.25	7.50
2	3.25	6.50
3	2.75	6.00
4	2.50	5.75
5	2.00	5.25
6	1.75	5.00
7	1.50	4.75
8	1.50	4.75
9	1.25	4.50
10	1.25	4.50
11	1.00	4.25
12	1.00	4.25
13	1.00	4.25
14	0.75	4.00
15	0.50	3.75
16	0.50	3.75
17	0.50	3.75
18	0.50	3.75
19	0.50	3.75
20	0.25	3.50
21	0.25	3.50
22	0.25	3.50
23	0.25	3.50
24	0.00	3.25
25 or more	0.00	3.25

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 3.25% Wage Inflation**
0	6.00%	9.25%
1	5.25	8.50
2	4.25	7.50
3	4.00	7.25
4	3.75	7.00
5	3.50	6.75
6	3.50	6.75
7	3.25	6.50
8	3.25	6.50
9	3.00	6.25
10	2.50	5.75
11	2.25	5.50
12	2.00	5.25
13	1.50	4.75
14	1.25	4.50
15	1.00	4.25
16	0.75	4.00
17	0.50	3.75
18	0.50	3.75
19	0.50	3.75
20	0.50	3.75
21	0.50	3.75
22	0.50	3.75
23	0.25	3.50
24	0.25	3.50
25 or more	0.00	3.25

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

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 3.25% Wage Inflation**
0	5.25%	8.50%
1	4.75	8.00
2	4.50	7.75
3	4.25	7.50
4	4.25	7.50
5	4.00	7.25
6	4.00	7.25
7	3.50	6.75
8	3.25	6.50
9	2.75	6.00
10	2.25	5.50
11	1.75	5.00
12	1.50	4.75
13	1.25	4.50
14	1.00	4.25
15	1.00	4.25
16	1.00	4.25
17	0.75	4.00
18	0.50	3.75
19	0.50	3.75
20	0.50	3.75
21	0.25	3.50
22	0.25	3.50
23	0.25	3.50
24	0.00	3.25
25 or more	0.00	3.25

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 80% of the ultimate rates from the MP-2019 mortality improvement scale using a base year of 2020.
Female retirees: 110% of 2020 PR UTAH Retiree Mortality Table for females, projected with 80% of the ultimate rates from the MP-2019 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 80% of the ultimate rates from the MP-2019 mortality improvement scale using a base year of 2020.
Female retirees: 90% of 2020 PR UTAH Retiree Mortality Table for females, projected with 80% of the ultimate rates from the MP-2019 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	2020	2025	2030	2035	2040
Noneducators - Male	21.0	21.3	21.6	21.9	22.2
Noneducators - Female	22.7	23.0	23.3	23.6	23.9
Educators/Judges - Male	22.6	22.9	23.2	23.5	23.8
Educators/Judges - Female	24.3	24.6	24.9	25.2	25.5

9. *Disabled annuitant mortality rates*:

Males: 115% of the PUB-2010 for Disabled Males (General Employees), projected with 80% of the ultimate rates from the MP-2019 mortality improvement scale using a base year of 2010.
Females: 125% of the PUB-2010 for Disabled Females (General Employees), projected with 80% of the ultimate rates from the MP-2019 mortality improvement scale using a base year of 2010.

Disabled Mortality Rates in Base Table before Projections (Multipliers Applied)		
Age	**Males**	**Females**
20	0.004738	0.002913
25	0.003197	0.002050
30	0.004071	0.003213
35	0.005267	0.005013
40	0.007418	0.007863
45	0.011581	0.012313
50	0.018458	0.018538
55	0.024311	0.021775
60	0.028785	0.024450
65	0.035006	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	**2020**	**2025**	**2030**	**2035**	**2035**
Males	15.4	15.8	16.2	16.5	16.9
Females	16.9	17.2	17.6	18.0	18.3

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 6.95% 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 6.95% 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 80% of the ultimate rates from the MP-2019 mortality improvement scale. 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.