Police and Firemen's Retirement System of New Jersey

Actuarial Experience Review

Analysis of Actuarial Experience during the Period July 1, 2021 through June 30, 2024

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Segal

Segal

Via Email

June 3, 2025

Board of Trustees
Police and Firemen's Retirement System of New Jersey
50 West State Street
Trenton, NJ 08625

Re: Actuarial Experience Review for the Period July 1, 2021 through June 30, 2024

Dear Board Members:

This report presents the results of the actuarial review of the demographic and economic experience of the Police and Firemen's Retirement System of New Jersey (PFRS) for the period July 1, 2021 through June 30, 2024. This experience review was prepared in accordance with Title 43, Chapter 16A-13 of the NJ State Statute which governs the System, which requires the actuary for PFRS to make an actuarial investigation into the mortality, service, and other experience of the members, retirees and beneficiaries covered under the System at least once every three years. Economic assumptions for PFRS are reviewed on an annual basis but are also discussed in this report.

All current actuarial assumptions were reviewed as part of this study. This review is the basis for our recommendation of the assumptions to be used beginning with the July 1, 2025 actuarial valuation.

In preparing the results presented in this report, we have relied upon data provided to us by the Division of Pension and Benefits (DPB) regarding the membership census data and financial information. This experience study analysis is based on census data and information between July 1, 2021 and June 30, 2024. While the scope of our engagement did not call for us to perform an audit or independent verification of this information, we have reviewed it for reasonableness. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information.

This review recommends assumptions to be used in the valuation to measure the System's financial condition as of a single date. Future actuarial measurements may differ significantly from the current measurements presented in this report. This report does not include an analysis of the potential range of such future measurements.

Segal valuation results and experience study analysis are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Deterministic cost projections are based on a proprietary forecasting model. Raw experience study analysis of actual and expected decrements are generated by a model, which is used to

develop recommended assumption changes. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility, and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuaries.

Our analysis was conducted in accordance with generally accepted actuarial principles as prescribed by the Actuarial Standards Board (ASB) and the American Academy of Actuaries. Additionally, the development of all assumptions contained herein is in accordance with ASB Actuarial Standard of Practice (ASOP) No. 27 (*Selection of Economic Assumptions for Measuring Pension Obligations*) and ASOP No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*).

The undersigned actuary is a Fellow of the Society of Actuaries, an Enrolled Actuary, and a Member of the American Academy of Actuaries, and is experienced in performing experience studies for large public retirement systems. He meets the Qualification Standards of the American Academy of Actuaries.

Respectively submitted,

Jonathan Scarpa, FSA, MAAA, EA
Vice President and Consulting Actuary

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Police and Firemen's Retirement System of New Jersey

Experience Review for the Period July 1, 2021 through June 30, 2024

I. Executive Summary

A. Introduction

Actuarial valuations are prepared annually to determine whether the contributions being made by members and employers are sufficient to fund the Police and Firemen's Retirement System of New Jersey (PFRS). Each actuarial valuation is dependent on the assumptions that the actuary uses to project the benefits expected to be paid in the future to all members of PFRS. The projection of expected future benefit payments is based on the characteristics of members as of the valuation date, the benefit provisions in effect on that date, and assumptions of future events and conditions.

The purpose of this report is to present the results of the experience review of the actuarial assumptions used in the actuarial valuation of PFRS. With the Board's approval of the recommendations in this report, these assumptions will be first used beginning with the July 1, 2025 actuarial valuation.

The assumptions used in actuarial valuations can be grouped into two categories: (1) economic assumptions – the assumed long-term rate of investment return, inflation and salary increases, and (2) non-economic or demographic assumptions – the assumed rates of termination, disability, retirement, and mortality. Demographic assumptions are primarily selected on the basis of recent experience (although a change in plan design or the employment environment may suggest otherwise), while economic assumptions rely more on a forward-looking perspective of expected future trends.

In order to determine the probability of an event occurring, we examine the "decrements" and "exposures" of that event. Using termination from active employment, for example, we compare the number of employees (or estimated liability, in the case of liability-weighted analysis) who terminate in a certain age and/or service category (i.e., the number of "decrements") with those "who could have terminated" (i.e., the number of "exposures"). For example, if there were 5,000 active employees in the 20-24 age group at the beginning of the year and 500 of them terminate during the year, we would say the probability of termination in that age group is 500 ÷ 5,000 or 10%. Similarly, in a liability-weighted approach, if there were $5,000,000 of active liability in the 20-24 age group and $500,000 of this liability is released due to terminations during the year, we would arrive at the same 10% probability of termination.

When setting the demographic assumptions (other than mortality), we typically develop proposed assumption rates by moving between the current assumption rate and the rate that the experience shows for that particular decrement. For example, if the probability of termination in the 20-24 age group is currently 8%, and the experience during the study period shows that 10% of eligible members actually terminated, we may propose adjusting the termination rate closer to the actual experience. In some cases, professional judgement is used to not fully weigh the current experience period and may also consider additional factors such as plan design changes, temporary benefit provisions during the study period or other external factors.

For the mortality assumption, we have reviewed the experience during the study period on a benefit-weighted or liability-weighted basis. There has been a large number of studies showing high correlation between mortality and income such as a pension which supports evaluating this assumption on a benefit-weighted basis.

If actual experience exactly matches the expected experience, the actual annual cost of PFRS will equal the annual cost determined by the actuarial valuation. However, this result is virtually never achieved, due to the long-term nature of the benefit projections and the numerous assumptions used in actuarial valuations. PFRS recognizes actuarial gains and losses each year, reflecting the net difference between actual experience and anticipated experience. A pattern of gains or losses with respect to one or more assumptions is the basis for recommended changes to the assumptions. Each valuation measures the effectiveness of each assumption and allows for the monitoring of the assumptions.

Actuarial experience studies are undertaken periodically and serve as the basis for recommended changes in actuarial assumptions and methods. A change in assumptions is recommended when it is demonstrated that the current assumptions do not accurately reflect the current trend determined from analysis of the data or anticipated future trends based upon reasonable expectations. The data analyzed include actual experience for demographic assumptions and economic forecasts for economic assumptions.

The Actuarial Standards Board (ASB) provides actuaries with standards of practice that provide guidance and recommendations on acceptable methods and techniques to be used in developing both economic and demographic assumptions. Specifically, these are the ASB Actuarial Standard of Practice (ASOP) No. 27 (*Selection of Economic Assumptions for Measuring Pension Obligations*) and ASOP No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*).

This study reviews the actuarial experience of PFRS for the three-year period beginning July 1, 2021 and ended June 30, 2024, compares this experience to the current actuarial assumptions, and recommends changes to the assumptions as necessary. Economic assumption recommendations were primarily developed based on inputs related to economic forecasts and capital market expectations.

A summary of the key points of our review and our recommendations follows.

B. Recommendations

The experience review provides an opportunity for the Board, PFRS staff, and actuary to consider how specific assumptions affect the funding of the System, including the funded ratio and to ensure adequate contribution levels are made by members and employers to fund the System. We have reviewed both economic and demographic experience of the System as it relates to the expected actuarial experience based on the current plan assumptions. Included are recommendations for changes in assumptions that we believe will more accurately reflect the future experience of PFRS.

The detailed analysis of each individual assumption is discussed later in this report.

Economic Assumptions

Economic assumptions include inflation, rate of investment return (or discount rate), and rate of individual salary increases. The investment rate of return assumption is evaluated on an annual basis in consultation with the Chief Financial Officer for PFRS.

Inflation

There was a spike in inflation that started in the second quarter of 2021 and continued into 2022. The rate of inflation started to decrease after the Federal Reserve began to increase interest rates starting around the second quarter of 2022. The Federal Reserve then changed course and reduced interest rates three times since the third quarter of 2024 in reaction to a continued reduction in inflation. However, they have recently signaled a pause in their adjustment to the interest rates until more economic data becomes available.

As of December 31, 2024, the one-year average increase in inflation was 2.95% and the five-year average increase in inflation was 4.2%. Projections of inflation range between approximately 2.2% and 2.5%, depending on the period and the source, and have declined since the prior experience study. **Based on the various sources for future inflation projections, we recommend a change in the inflation assumption from 2.75% to 2.50%.**

The remaining economic assumptions have an underlying inflation component. The investment return assumption is comprised of inflation and the real rate of return for each asset class. The assumed rates of individual salary increases are comprised of inflation, productivity, and merit and promotion increases.

Rate of Investment Return

The investment return assumption is chosen in consultation with the Chief Financial Officer for PFRS. The current investment return assumption is 7.0% and was last revised effective with the July 1, 2021 actuarial valuation.

The System has averaged market value investment returns of 7.5% and 6.7% over the last five-year and 10-year periods ended June 30, 2024, respectively.

Although Segal does not determine the investment return assumption, we have reviewed the target asset allocation policy and the 10-year and 20-year Capital Market Assumptions provided

in the Horizon Survey of Capital Market Assumptions (2024 Edition) and feel the current assumption of 7.0% is reasonable.

Rate of Individual Salary Increases

The assumed rates of individual salary increases are comprised of inflation, productivity, and merit and promotion increases. We study the merit and promotion increases separately from inflation and productivity, or "across-the-board" pay increases. It is assumed that members will receive raises above these average increases as they advance in their careers, which are commonly referred to as merit and promotion increases.

Analysis of the distribution of merit and promotion increases by years of service during the study period shows the actual salary increases over the three-year study period were for most ages greater than expected based on the prior assumption. This is consistent with the annual review of actuarial experience in the prior three funding valuations where actuarial losses due to salary were reported. **Based on this experience, we recommend a revision to the salary increase rates related to merit and promotion to better reflect the experience over the three-year study period.**

Demographic Assumptions

Demographic assumptions include mortality, retirement, termination (or withdrawal), disability incidence, spouse information, and inactive vested member retirement age and benefit option election.

Mortality

Analysis of the mortality experience for the three-year period ended June 30, 2024 varied by population (i.e. healthy annuitants, disabled annuitants, contingent survivors and active members). For healthy annuitants, the population with highest credibility and most significant impact on the System's liability, there were less deaths than expected on a benefit amount weighted basis.

The current assumptions for pre-retirement mortality, post-retirement mortality and disabled retiree mortality are based on the Pub-2010 Public Safety Mortality Tables (sex-distinct), with adjustments made for some groups based on credibility. In 2025, the Retirement Plan Experience Committee (RPEC) released mortality tables with updated mortality experience for public retirement plans, referred to as the Pub-2016 Public Retirement Plans Mortality Tables (Pub-2016). **It is our recommendation that all mortality assumptions be updated to use the Pub-2016 mortality tables to reflect the most recent information published by RPEC.**

RPEC continues to observe that benefit amount for healthy retirees is the most significant predictors of mortality differences within an individual job category. **As a result, the recommended mortality tables have underlying rates that are determined on an "amount-weighted" basis.**

As part of our analysis we examined the credibility for each individual group as described in more detail later in this report. If sufficient credibility existed, an adjustment was made to the base table to reflect the mortality experience of PFRS in relation to the base mortality table. **Our**

recommendations for adjustments to the base mortality tables, or lack thereof, are included later in this report.

Periodically, RPEC publishes updates to their mortality improvement scales. The two-dimensional mortality improvement scale MP-2021 is the latest improvement scale available as of the date of this report and is the current assumption for PFRS. **We recommend the continued use of the MP-2021 mortality improvement scale to reflect future mortality improvement.**

Additional Detail is provided in Section III.

Other Demographic Experience

Based on a review of the retirement, termination, and disability award experience during the study period, we have made recommendations for each assumption to reflect the new experience. None of the recommend changes are substantial and none will have a significant impact on the cost of the plan.

Additional detail is provided in Section III.

Summary of Assumptions and Recommended Changes

The following table summarizes the actuarial assumptions used in the valuation and the changes recommended in this report.

Description	Current	Proposed
Economic Assumptions		
Inflation	2.75%	**2.50%**
Productivity	0.50%	No change
Salary Scale	Merit (including productivity) rates based on years of service plus inflation	**Adjustments to merit rates at various years of service plus productivity plus inflation**
Investment Return	7.00%	No change
Demographic Assumptions		
Healthy Post-Retirement Mortality	Pub-2010 Public Safety Retiree Below Median Amount-Weighted Mortality Table for males and females	**Pub-2016 Public Safety Below Median amount-weighted mortality table for males and 98% of the Pub-2016 Public Safety Below Median amount-weighted mortality table for females**
Beneficiary Mortality	Pub-2010 General Retiree Below-Median amount-weighted mortality table	**Pub-2016 Below Median Contingent Survivor Mortality table for males and 102% of the Pub-2016 Below Median Contingent Survivor Mortality Table for females**
Disabled Mortality	144% of the Public Safety Disabled Retiree amount-weighted mortality table for males and 100% of the Public Safety Disabled Retiree amount-weighted mortality table for females	**134% of the Pub-2016 Public Safety Disabled Retiree Amount-Weighted Mortality Table for males and Pub-2016 Public Safety Disabled Retiree Amount-Weighted Mortality Table for females**
Pre-Retirement Mortality	Pub-2010 Public Safety Employee amount-weighted mortality table for males and females	**Pub-2016 Public Safety Employee Mortality Table (sex distinct)**
Mortality Improvement	Generational projection using Scale MP-2021	No change
Active Retirement	Rates based on age with separate rate tables for those with less than 25 years of service, 25 years of service and more than 25 years of service.	**Adjust rates based on plan experience**
Termination	Rates based on years of service	**Adjust rates based on plan experience**
Disability	Rates based on age	**Adjust rates based on plan experience**

Impact of Assumption Changes on Valuation Results

The following tables detail the impact of the recommended assumption changes, using the July 1, 2024 actuarial valuation results for illustrative purposes. When the proposed set of assumptions is used in the July 1, 2025 valuation, the relative impact is expected to be similar to the results shown below (as a percentage of the actuarial accrued liability and normal cost). However, the actual impacts may vary due to underlying changes that occur between valuation dates. The comparability may also be affected by the actual investment return and demographic experience during the year.

	Actuarial Accrued Liability (Millions)	Normal Cost (Millions)
July 1, 2024 Actuarial Valuation[1]	**52,014.81**	**954.49**
Assumption Change	**Change in Liability**	**Change in Normal Cost**
Mortality	-264.73	-2.07
Active Retirement	+201.15	+10.55
Termination	-104.52	-12.66
Disability	+126.76	+12.44
Salary Scale	+642.12	+79.35
Total	**+600.78**	**+87.60**
July 1, 2024 Actuarial Valuation with changes	**52,615.60**	**1,042.09**

	State			Local		
	Statutory Contribution Prior to State-Paid Local Adjustments ($Millions)	Statutory Contribution After State-Paid Local Adjustments ($Millions)	Funded Percentage (Based on MVA)	Statutory Contribution Prior to State-Paid Local Adjustments ($Millions)	Statutory Contribution After State-Paid Local Adjustments ($Millions)	Funded Percentage (Based on MVA)
July 1, 2024 Actuarial Valuation	404.45	647.28	37.2%	1,626.22	1,383.40	72.2%
Change due to Assumption Changes	19.30	19.31	-0.5%	124.58	164.60	-0.7%
Total	423.75	666.59	36.7%	1,750.80	1,548.00	71.5%

[1] Excludes the present value of ERI payments, as of the 2024 funding valuation that was equal to $2,572,735

II. Economic Assumptions

Economic assumptions have a significant impact on the development of plan liabilities. Changes to these assumptions can substantially alter the actuarial valuation results.

The economic assumptions that affect the valuation results of the System are:

- Inflation;
- Rate of Investment Return;
- Rate of Individual Salary Increases;

The Actuarial Standards Board (ASB) has adopted Actuarial Standard of Practice No. 27 (*Selection of Economic Assumptions for Measuring Pension Obligations*) to provide actuaries guidance in developing economic assumptions.

The inflation component is included in all economic assumptions, and therefore is key to developing a consistent set of actuarial assumptions. The rate of investment return assumption includes an inflation component and a real rate of return component. The components of the salary increase assumption are inflation, productivity or real wage growth, and merit and promotion increases.

A. Inflation

In developing the recommendation for the assumed inflation component, actuarial standards of practice suggest the actuary review appropriate inflation data. This data may include consumer price indexes, forecasts of inflation, and yields on government securities of various maturities.

The table below presents recent inflation experience over the past fifty years.

Historical Consumer Price Index – Averages
(U.S. City Average - All Urban Consumers)[1]

Average Annual Change as of December 31, 2024	CPI-U
1-Year Average	2.95%
5-Year Average	4.18%
10-Year Average	2.85%
20-Year Average	2.57%
50-Year Average	3.77%

The recent inflationary environment has been volatile, notably the average change of 4.18% over the prior five-year period ended December 31, 2024. During that period, the average annual change in inflation has ranged from 1.23% to 8.00%. However, over the most recent year ended December 31, 2024, inflation has declined. Historical trend is a less important consideration for

[1] Source: Bureau of Labor Statistics – Based on CPI for All Items in U.S. city average, all urban consumers, not seasonally adjusted (Series ID: CUUR0000SA0).

the assumed rate of inflation, but assists in determining the reasonable bounds of expected inflation.

Since 2012, Horizon Actuarial Services, LLC has published survey results that summarize the capital market assumptions of various investment firms. Based on the survey results from the 2024 Survey of Capital Market Assumptions[1], the average 10-year inflation assumption across 41 survey respondents was 2.42% and the average 20-year inflation assumption across a subset of 20 survey respondents that provided assumptions for 20 years was 2.44%. One of the respondents, Segal Marco Advisors assumes 2.4% inflation in developing their capital market expectations as of December 31, 2024.

Based on information found in the Public Plans Database, which is produced in partnership with the National Association of State Retirement Administrators (NASRA)[2], the median inflation assumption used by large public retirement funds in their 2023 fiscal year valuations was 2.50%.

Yet another source of inflation data is the Survey of Professional Forecasters published by the Federal Reserve Bank of Philadelphia[3]. The 10-year forecast from the Second Quarter 2025 report is 2.35%.

The table below compares projected inflation expectations from various sources.

Source	10-Year	20-Year
Federal Reserve Bank of Philadelphia First Quarter 2025 Survey of Professional Forecasters (2025 Q2)	2.35%	
Public Plans Database – median inflation assumption for large public retirement funds	2.50%	
Segal Marco Advisors	2.40%	2.40%
2024 Horizon Survey of Capital Market Assumptions	2.42%	2.44%

We also referred to the 2024 report on the financial status of the Social Security program[4]. The projected average increase in price inflation over the next 75 years under the intermediate cost assumptions used in that report was 2.40%. The price inflation measure used in this report is the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W)[5]. Besides projecting the results under the intermediate cost assumptions using an inflation assumption of 2.40%, alternative projections were also made using a lower and a higher inflation assumption of 1.80% and 3.00%, respectively.

[1] Survey of Capital Market Assumptions 2024 Edition, August 2024, Horizon

[2] Among 228 large public retirement funds, the 2023 fiscal year inflation assumption was not available for 8 of the public funds in the survey data as May 2025.

[3] https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/spf-q2-2025, Second Quarter Survey of Professional Forecasters, May 16, 2025

[4] Source: Social Security Administration – The 2022 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds

[5] The CPI-W is a more specialized index relative to CPI-U and seeks to track retail prices as they affect urban hourly wage earners and clerical workers. It encompasses about 32 percent of the United States' population and is a subset of the CPI-U group. The CPI-W places a slightly higher weight on food, apparel, transportation, and other goods and services. It places a slightly lower weight on housing, medical care, and recreation. The CPI-U is a more general index and seeks to track retail prices as they affect all urban consumers. It encompasses about 87 percent of the United States' population.

Next, we consider a market-based forecast for future inflation. Treasury Inflation Protection Securities (TIPS) are government bonds, which, in addition to a fixed yield, add the actual percentage change in CPI to the principal value. Therefore, the spread between the TIPS and the conventional Treasury bond of the same maturity is an indication of the market's forecast for inflation.

The following table compares the yields on US Treasury Bonds as of May 27, 2025, with and without inflation indexing.

US Treasury Bonds as of May 27, 2025	10-Year Yield	30-Year Yield
Non-Inflation Indexed	4.47%	4.98%
Inflation Indexed	2.11%	2.71%
Difference	2.36%	2.27%

Because of the inflation protection, TIPS' yields are considerably lower than those of regular Treasury securities of similar maturities. As May 27, 2025, 30-year Treasuries yielded 4.98% while 30-year TIPS yielded 2.71%. In order for 30-year TIPS to match the return of the conventional 30-year Treasury for a buy-and-hold, investor, inflation would have to measure 2.27% per year over the next 30 years. In addition, the market's view of inflation over the shorter term period of ten years is similar to that over the 30-year period.

The market's expectation of inflation alone is not a definitive basis for an inflation assumption due to other factors that affect the yields of those securities, but is useful as one indicator of future trend.

Considering all of this information, we recommend a change to the current inflation assumption of 2.75% to 2.50%. This assumption will continue to be evaluated on an annual basis.

B. Rate of Investment Return

The rate of investment return is used to estimate annual investment return and to determine the present value of expected future payments from the System. The selection of an investment return assumption considers capital market outlook, the Systems' target allocation policy, and, to a lesser extent, historical returns.

The current assumption is 7.00%, which is comprised of the following components:

- Inflation: 2.50%
- Real Rate of Return: 4.50%

The table below shows the System's actual investment returns on a market value basis as well as an actuarial value basis.

Average Annual Return as of June 30, 2024	Market Value of Assets	Actuarial Value of Assets
Past 5 Years	7.5%	6.7%
Past 10 Years	6.7%	6.6%
Past 15 Years	8.5%	6.2%
Past 20 Years	7.1%	5.9%

Over the past twenty years, average market returns have been approximately equal to the current investment return assumption of 7.0%. The average market return over the recent five-year period ended June 30, 2024 has been higher. Over all periods shown, the average actuarial return has been below the assumed return. Due to the asset smoothing method defined in Statute that recognizes market gains and losses over a prolonged period and the significant investment loss in 2009, actuarial returns have lagged behind market returns during this period. Historical trend is a less important consideration for the assumed rate of investment return, but assists in determining the reasonable bounds of expected investment return.

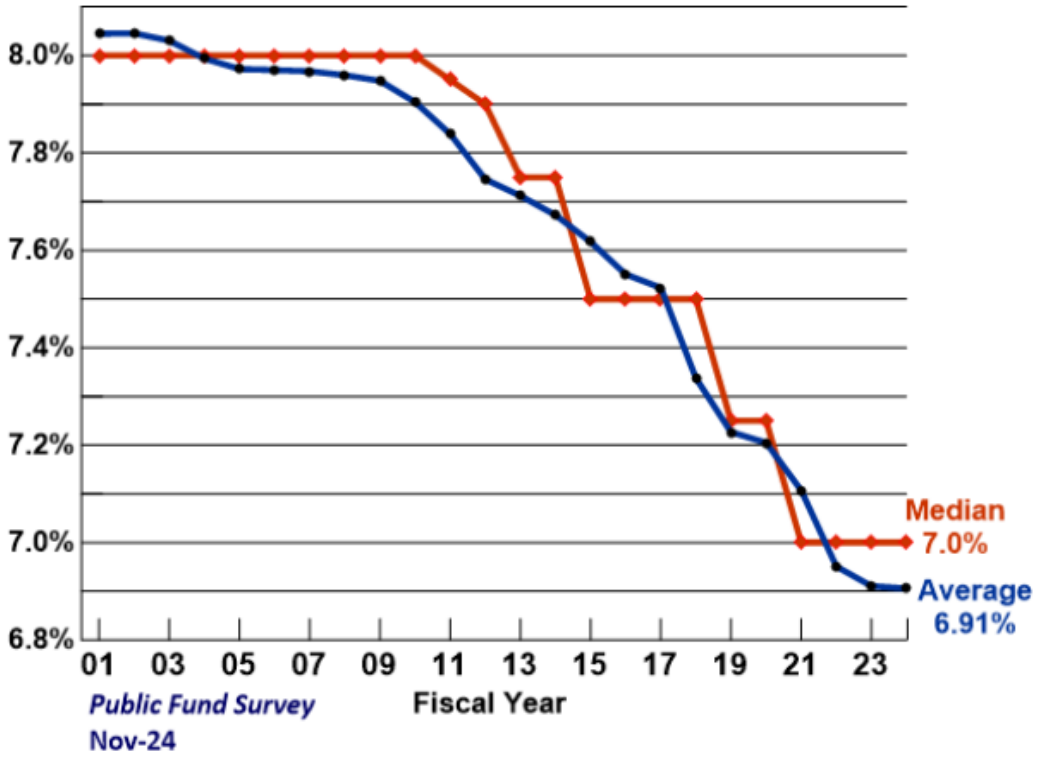
The investment rate of return assumption is reviewed using the "building block" approach as outlined in ASOP 27. Under this approach, the investment rate of return assumption is made up of two components; the inflation component and the real investment rate of return component. The inflation component is combined with the reasonable real rate of return component to determine a reasonable expected long-term return for the System.

The investment return assumption is reviewed annually in consultation with the Chief Financial Officer. Based on our review of the plan's target asset allocation policy as well as projected returns for various asset classes we feel the current assumption of 7.0% is reasonable. In addition, after reflecting the recommended change to the inflation assumption, the current investment return assumption of 7.0% continues to be reasonable.

Comparison to the Public Sector Universe

The 7.00% investment return assumption is consistent with the rest of the public sector universe. In November 2024, the National Association of State Retirement Administrators (NASRA) issued their annual Public Fund Survey[1] for the 2023 Fiscal Year. Among the 131 plans in its survey, the average investment return assumption is 6.91% and the median assumption is 7.00%.

The graph below, from that Public Fund Survey, shows the trend in the investment return assumption from 2001 to 2024. Over that period, the median assumed return has declined from 8.0% to 7.0%. Similarly, the average assumed return has declined from above 8.0% to 6.9%. However, the median assumed return has remained level at 7.0% since 2021. The investment return assumption for PFRS was last changed effective July 1, 2021 to 7.0%.



[1] Public Fund Survey, Summary of Findings for FY 2023, November 2024, NASRA

C. Rate of Individual Salary Increase

The rate of individual salary increase are used to project members' benefits provided by the System. Generally, a member's salary will change over the long term in accordance with inflation, productivity, and merit and promotion increases. The actuary should review available compensation data when selecting this assumption, including current compensation practices and any anticipated changes, historical compensation increases and practices of public safety districts and other employers in the same industry or geographic area, and historical national wage increases and productivity growth.

The estimated rate of individual salary increases consists of the following components:

- Inflation
- Productivity
- Merit and promotion increases

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

As discussed earlier in this report, we recommend lowering the annual inflation assumption to 2.50%.

Productivity: These increases are typically termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board".

This component accounts for factors such as productivity improvements or growth in the payroll base and is also used as a component of the projection of the Social Security Wage Base.

We recommend maintaining the current assumption of 0.5% for the productivity component of individual salary increases.

Merit and Promotion: Since merit increases are unique to each retirement system, it is appropriate to base this assumption on recent experience. We study the merit and promotion increases net of inflation and productivity, which represents "non-inflation" increases in individual salaries. Merit and promotion increases are reviewed on a "salary-weighted" basis with higher weights assigned to experience from members with higher salaries.

The current salary increase assumption (including inflation and productivity) uses service-based rates that range from 16.25% at one year of service to 3.25% at 17 or more years of service. The historical compensation data was evaluated based on age and service. The strongest relationship continues to be based on members' service.

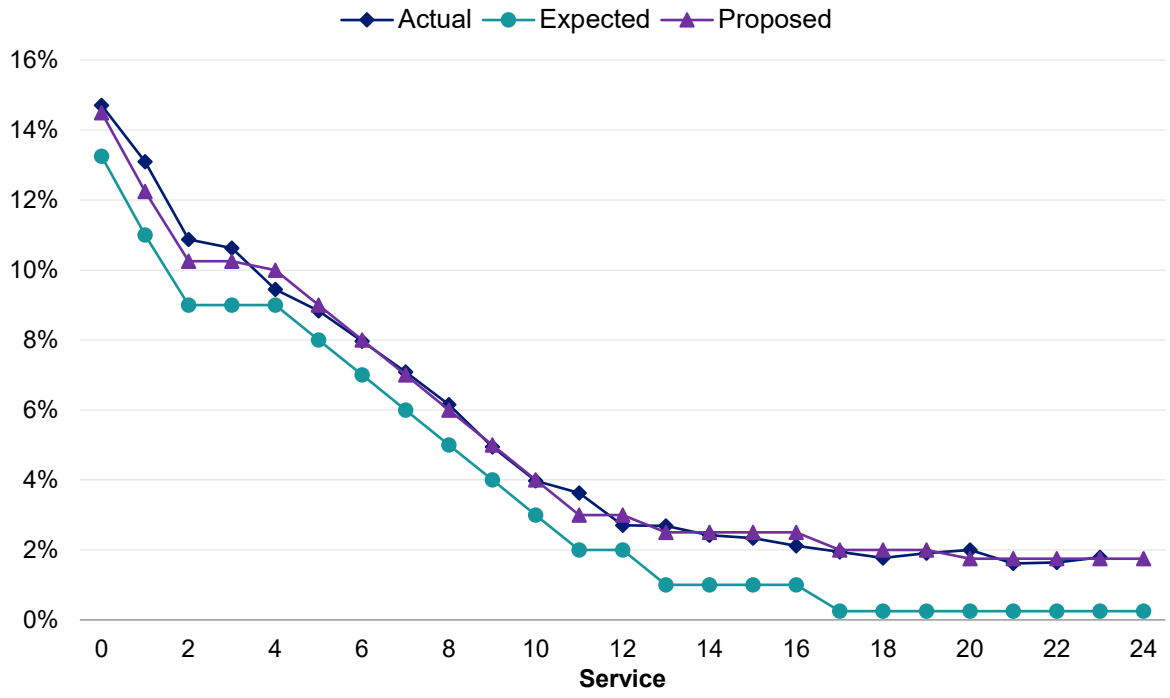
The actual salary increases over the three-year study period were in general higher than what would have been expected based on the current assumption. This is consistent with the prior three funding valuation reports (July 1, 2022- 2024) where actuarial losses due to salary increases greater than expected were reported in each valuation. W**e recommend a revision to the salary increase rates related to merit and promotion to match the experience more closely over the three-year study period.**

The following table and graph compare the actual, expected and proposed individual salary increases during the period of the experience study, net of inflation and productivity.

Years of Service	Prior Year Salaries (in $000s)	Actual Salaries[1] (in $000s)	Actual Salary Increase Rate	Expected Salaries[2] (in $000s)	Expected Salary Increase Rate	Proposed Salary Increase Rate
0	57,401	65,845	14.71	64,785	13.25	14.50
1	221,483	250,495	13.10	245,142	11.00	12.25
2	267,120	296,169	10.87	290,469	9.00	10.25
3	313,743	347,082	10.63	341,157	9.00	10.25
4	397,391	434,949	9.45	432,108	9.00	10.00
5	445,788	485,150	8.83	480,414	8.00	9.00
6	482,479	520,899	7.96	515,273	7.00	8.00
7	499,776	535,197	7.09	528,902	6.00	7.00
8	506,676	537,855	6.15	531,283	5.00	6.00
9	471,819	495,167	4.95	490,154	4.00	5.00
10	396,670	412,428	3.97	408,233	3.00	4.00
11	294,020	304,676	3.62	299,738	2.00	3.00
12	262,355	269,441	2.70	267,446	2.00	3.00
13	310,005	318,343	2.69	313,020	1.00	2.50
14	419,672	429,829	2.42	423,747	1.00	2.50
15	513,413	525,418	2.34	518,397	1.00	2.50
16	578,081	590,329	2.12	583,686	1.00	2.50
17	561,312	572,251	1.95	562,685	0.25	2.00
18	532,802	542,225	1.77	534,095	0.25	2.00
19	484,835	494,083	1.91	486,012	0.25	2.00
20	501,234	511,271	2.00	502,450	0.25	1.75
21	523,530	531,973	1.61	524,800	0.25	1.75
22	538,929	547,784	1.64	540,238	0.25	1.75
23	538,924	548,559	1.79	540,232	0.25	1.75
24	417,293	425,391	1.94	418,306	0.25	1.75
25+	1,026,032	1,041,360	1.49	1,028,522	0.25	1.00

[1] Adjusted for actual average inflation and productivity, a total of approximately 3.00% during the experience period.
[2] Adjusted for assumed inflation and productivity, a total of 3.00%.

Salary Increase Experience, in Excess of Inflation and Productivity



III. Demographic Assumptions

The demographic assumptions used to value the System reflect the expected occurrences of various events among members of the System. The assumptions should reflect specific characteristics of the member population and plan provisions and produce reasonable results. A reasonable assumption is one that is expected to model the contingency being measured and not expected to produce significant and/or consistent gains and losses. The types of demographic assumptions used to measure pension obligations include, but are not limited to, the following:

- Mortality;
- Retirement;
- Termination;
- Disability incidence; and
- Other assumptions such as spouse information, inactive vested member's form of payment election and retirement age for inactive vested members

The Actuarial Standards Board (ASB) has adopted Actuarial Standard of Practice No. 35 (*Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*) to provide actuaries guidance in developing demographic assumptions. The standard recommends the actuary follow a general procedure for selecting demographic assumptions. The first step is to identify the types of assumptions to use. The actuary should consider relevant plan provisions that will affect timing and value of any potential benefit payments, all contingencies that give rise to benefits or loss of benefits, and the characteristics of the covered group. The next step is to identify the relevant assumption universe. The assumption universe may include prior experience studies or general studies of trends relevant to the type of demographic assumption in addition to plan experience to the extent that it is credible. The third step is to consider the assumption format. The format may include different tables for different segments of the covered population (i.e., different mortality tables for males/females). The last step is to select the specific assumption and evaluate the reasonableness of each assumption. The specific experience of the System should be incorporated but not given undue weight to past experience if recent experience is attributable to a phenomenon that is unlikely to continue. For example, if recent rates of termination were due to a one-time reduction in workforce it may be unreasonable to assume that such rates will continue.

III: Demographic Assumptions

A. Mortality

One of the most significant actuarial assumptions is the probability of death, which drives expectations of annuitant longevity and, therefore, the duration of pension payments. The mortality assumption takes the form of a mortality table that for each age has a probability of a person dying between that age and the next. PFRS currently uses four sets of mortality tables for its population: post-retirement mortality, disabled mortality, beneficiary mortality, and pre-retirement mortality.

In 2019, the Retirement Plan Experience Committee (RPEC) and the Society of Actuaries (SOA) published a series of mortality tables derived from public plan experience, referred to as the Pub-2010 Mortality Tables (Pub-2010). The published mortality tables are divided into three broad categories: teachers, public safety, and general employees. In addition, the study concluded that surviving annuitants demonstrated worse mortality than the primary annuitants. As a result, separate contingent survivor tables were developed.

In 2025, the Retirement Plan Experience Committee (RPEC) released mortality tables with updated mortality experience for public retirement plans, referred to as the Pub-2016 Public Retirement Plans Mortality Tables (Pub-2016).

In 2008, the SOA published an article recommending that mortality assumptions include an adjustment for credibility. Under this approach, the number of actual deaths in a sub-group needed for "full credibility" is 1,082. Full credibility in this context means 90% confidence that the actual experience will be within 5% of the expected value. Partial credibility can be assigned where actual deaths in a group or sub-group are less than 1,082. Partially credible results can be blended with an appropriate, unadjusted published base table.

We analyzed the experience by weighting the probability of death with each annuitant's pension benefit amount. This methodology takes into consideration the correlation between the annuitant mortality and the level of benefit. When reviewing the actual experience under each of the four categories, we compared actual experience with the current mortality tables.

Our recommendation is to update the mortality tables from the Pub-2010 mortality tables to the recently released Pub-2016 mortality tables for all mortality related assumptions. This ensures the mortality assumption used for PFRS is based on the most recent information published by RPEC.

In order to reflect future improvements in mortality, we recommend maintaining the use of the mortality projection scale MP-2021, the most recent mortality improvement scale published by the SOA.

A further discussion regarding mortality experience for each of the member and beneficiary categories is included below.

III: Demographic Assumptions

Post-Retirement Healthy Mortality

The mortality experience among retirees determines the duration over which retirement benefits are paid. Lower mortality rates mean longer benefit payment periods and, therefore, higher benefit costs.

Currently, PFRS uses healthy post-retirement mortality rates based on the Pub-2010 Public Safety Retiree Below Median Annuitant Mortality Table (sex-distinct), with no adjustment. Although the population of male retirees is fully credible, as part of the prior experience no adjustment to the base table was utilized to avoid bias from the COVID-19 pandemic.

During the experience study period, there were 61 female deaths and 2,171 male deaths, broken out as follows:

Female		Male	
Deaths	**Credibility**	**Deaths**	**Credibility**
61	21.7%	2,171	100.0%

We used these credibility adjustments to develop the recommended mortality assumption on a sex-distinct basis.

The following table provides a summary of mortality experience, on a benefits weighted basis, for healthy annuitants by gender for the study period as compared to the unadjusted base table:

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Male	**117,777**	**123,772**	**0.95**
Female	**2,656**	**2,893**	**0.92**
Total	**120,433**	**126,665**	**0.95**

For male retirees, the experience during the study period shows that on a benefits-weighted basis actual deaths were less than expected, based on the current mortality table. The actual amount of liability released due to mortality was 95% of expected.

For female retirees, there were less deaths than expected. On a benefits-weighted basis, the amount of liability released due to mortality was 92% of expected. However, the credibility factor for female deaths is much lower than for males.

As previously noted, we recommend updating the base table for the mortality assumption to the Pub-2016 mortality tables. The following table provides a summary of mortality experience, on a benefits weighted basis, for healthy annuitants by gender for the study period as compared to the Pub-2016 Public Safety Healthy Annuitant Below-Median mortality tables.

III: Demographic Assumptions

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Male	**117,777**	**117,294**	**1.00**
Female	**2,656**	**2,929**	**0.90**
Total	**120,433**	**120,223**	**1.00**

For male retirees, we recommend a change in the mortality table to the Pub-2016 Public Safety Below-Median Healthy Retiree Mortality Table (sex-distinct). Although the male retiree population has 100% credibility, based on the experience data relative to the published table no adjustment is recommended.

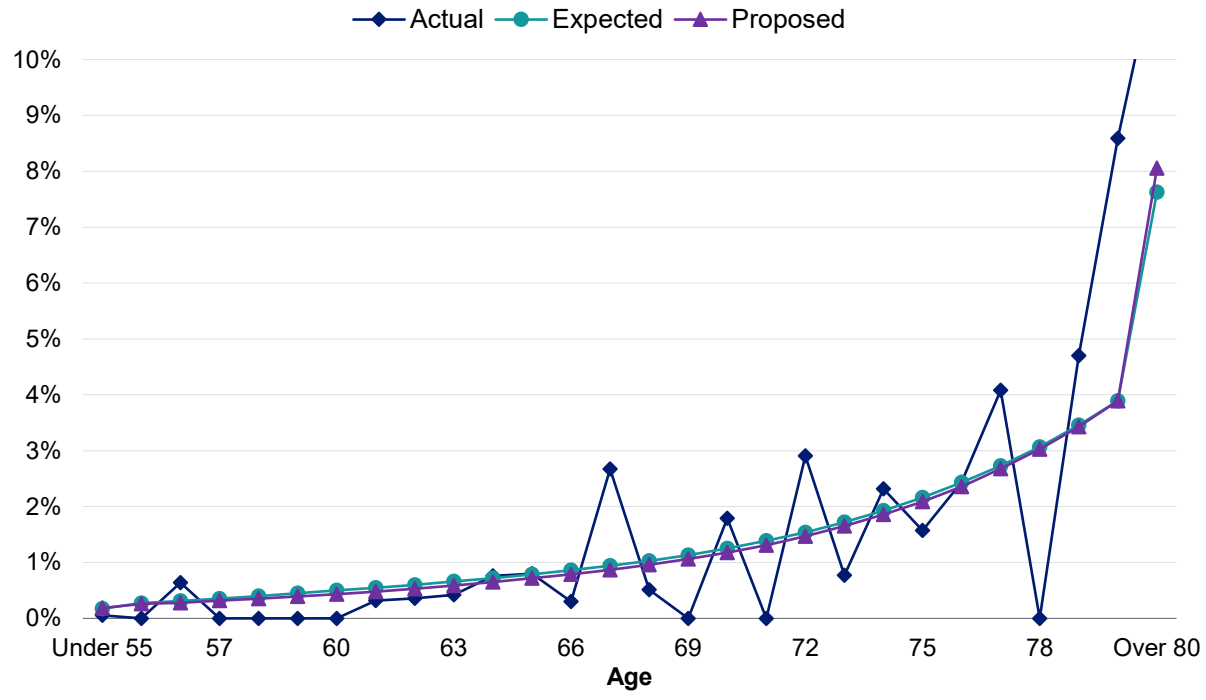
For female retirees, we recommend a change in the mortality table to the Pub-2016 Public Safety Below-Median Healthy Retiree Mortality Table (sex-distinct). Using the partial credibility factor of 21.7%, we recommend an adjustment factor of 98% for the female table.

Finally, in order to reflect future improvements in life expectancy, we recommend the continued use of the MP-2021 mortality projection scale, the most recent scale published by the Society of Actuaries.

The proposed healthy post-retirement mortality rates are shown in Appendix B.

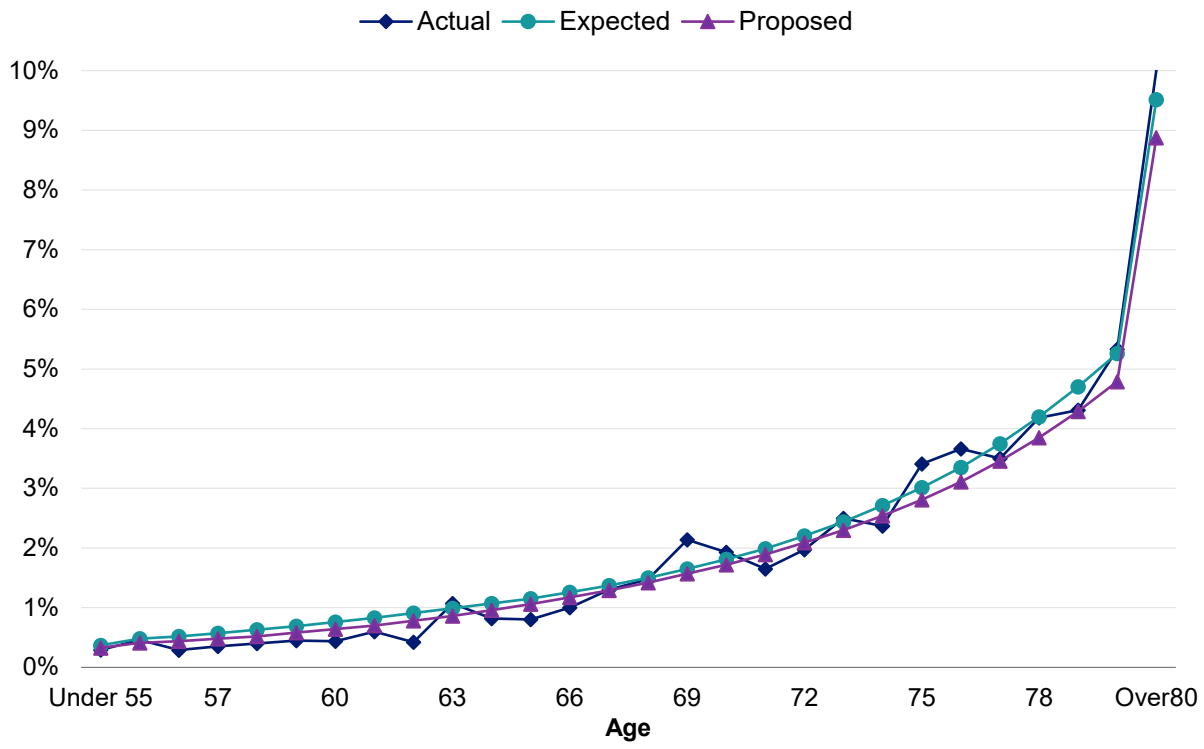
The following graphs show the actual mortality rates, expected mortality rates, and proposed mortality rates for females and males.

Actual Versus Proposed Experience, Benefits-Weighted Basis
Healthy Post-Retirement Mortality – **Female**



III: Demographic Assumptions

Actual Versus Proposed Experience, Benefits-Weighted Basis
Healthy Post-Retirement Mortality – **Male**



III: Demographic Assumptions

Disabled Mortality

Mortality experience among disabled annuitants is studied separately from healthy retirees because of higher levels of mortality exhibited by disabled retirees. The current mortality table for all disabled lives is based on the Pub-2010 Public Safety Disabled Retiree Mortality Table, projected generationally using Scale MP-2021. Male rates are adjusted by 144.0% for all ages and female rates are adjusted by 100.0% for all ages.

The following table details the mortality experience for disabled retirees over the study period for males and females.

Male		Female	
Deaths	**Credibility**	**Deaths**	**Credibility**
335	48.6%	20	12.4%

The following table summarizes the disabled annuitant mortality experience, on a benefits - weighted basis, for the study period compared to the unadjusted base table:

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Male	**10,735**	**8,868**	**1.21**
Female	**609**	**638**	**0.96**
Total	**11,344**	**9,506**	**1.19**

For male retirees, the experience during the study period shows that on a benefits-weighted basis actual deaths were greater than expected, based on the current mortality table. The actual amount of liability released due to mortality was 121% of expected.

For female retirees, there were less deaths than expected. On a benefits-weighted basis, the amount of liability released due to mortality was 96% of expected. However, the credibility factor for female deaths is very low.

The following table provides a summary of mortality experience, on a benefits weighted basis, for disabled retirees by gender for the study period as compared to the Pub-2016 Public Safety Disabled Retiree mortality tables.

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Male	**10,735**	**6,635**	**1.70**
Female	**609**	**688**	**0.89**
Total	**11,344**	**6,993**	**1.62**

III: Demographic Assumptions

For male disabled retirees, we recommend that the mortality table be changed to the Pub-2016 Public Safety Disabled Retiree Mortality Table (sex distinct). We further recommend an adjustment factor of 134%, which was developed based on 48.6% credibility of the mortality experience data.

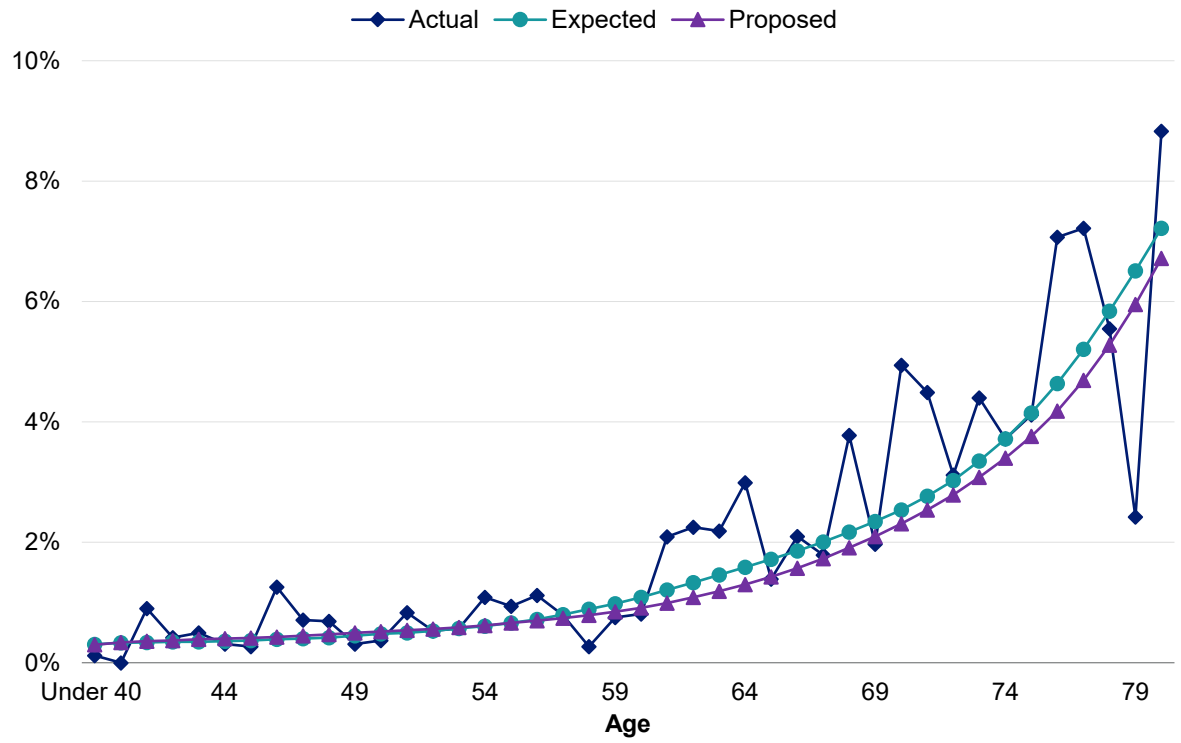
For female disabled retirees, we recommend that the mortality table be changed to the Pub-2016 Public Safety Disabled Retiree Mortality Table (sex distinct). We recommend no adjustment to the published table due to the low credibility of the mortality experience data.

Finally, in order to reflect future improvements in life expectancy, we recommend the continued use of the MP-2021 mortality projection scale, the most recent scale published by the Society of Actuaries.

The proposed disabled post-retirement mortality rates are included in Appendix B.

The following graph shows the actual mortality rate, expected mortality rate, and proposed mortality rate for males and females combined (although as noted earlier, the mortality table will be applied on a sex-distinct basis for valuation purposes).

Actual Versus Proposed, Benefits-Weighted Basis
Disabled Retiree Mortality – **All**



Beneficiary (Contingent Annuitant) Mortality

Mortality experience among beneficiaries is studied separately from healthy retirees because the industry effects that retirees experience may not be present in the mortality experience for those retirees' widows. In other words, the Public Safety Mortality Tables used for purposes of the member population may overstate the expected deaths for beneficiaries. For that reason, the current mortality assumption for beneficiaries, or contingent survivors, is the Pub-2010 General Retiree Below Median Income Mortality Tables, with no adjustment.

The experience and credibility factor over the three-year period for males and females is shown below.

Male		Female	
Deaths	**Credibility**	**Deaths**	**Credibility**
17	11.3%	1,156	97.7%

The following table summarizes the mortality experience for contingent survivors, on an amount weighted basis, for the study period compared to the unadjusted base table:

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Male	**468**	**282**	**1.66**
Female	**33,611**	**28,533**	**1.18**
Total	**34,079**	**28,815**	**1.18**

For male contingent survivors, the experience during the study period shows that on a benefits-weighted basis actual deaths were greater than expected, based on the current mortality table. The actual amount of liability released due to mortality was 166% of expected. However, the credibility factor for female deaths is very low.

For female retirees, actual deaths were greater than expected, based on the current mortality table. On a benefits-weighted basis, the amount of liability released due to mortality was 118% of expected.

The following table provides a summary of mortality experience, on a benefits weighted basis, for contingent annuitants by gender for the study period as compared to the Pub-2016 Below Median Contingent Survivor Mortality Tables:

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Male	**468**	**300**	**1.56**
Female	**33,611**	**32,982**	**1.02**
Total	**34,079**	**33,282**	**1.02**

III: Demographic Assumptions

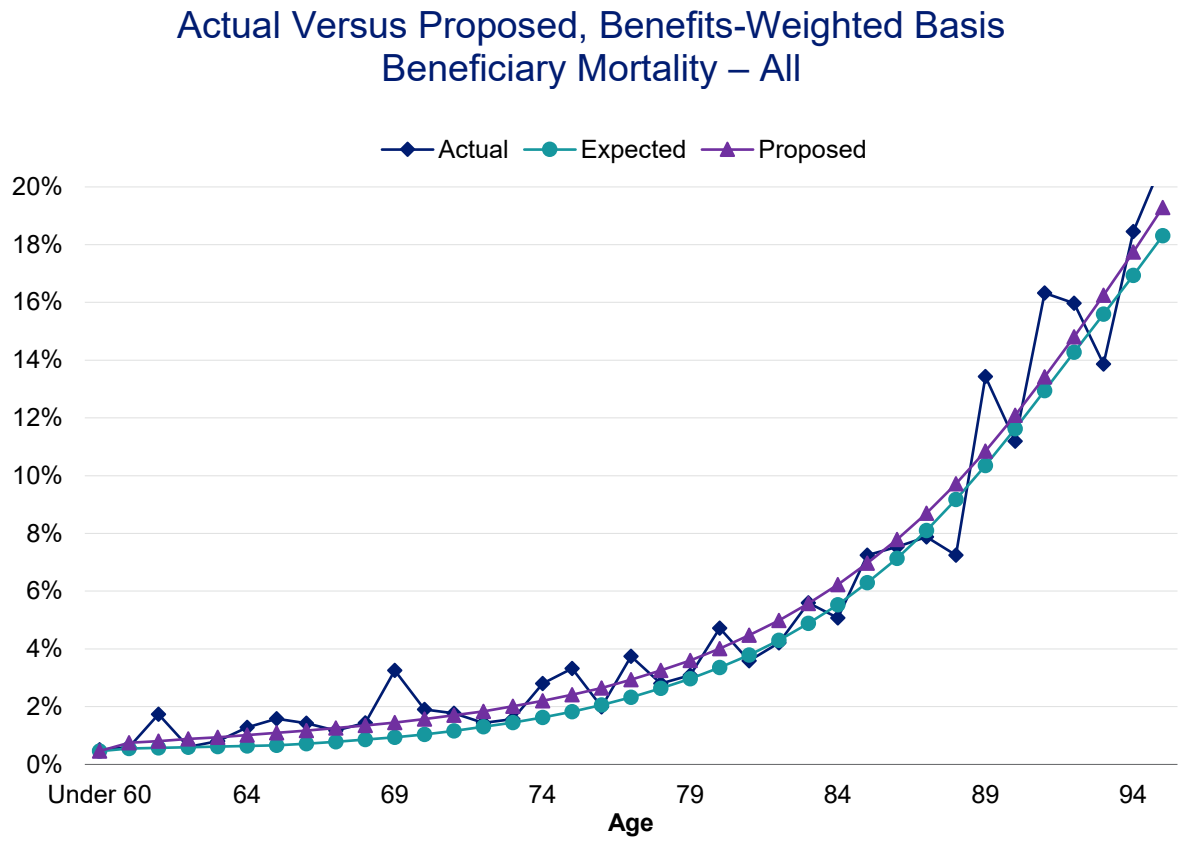
We recommend a change in the base table to the Pub-2016 General Below Median Contingent Survivor Amount-Weighted Mortality Tables. Note, this recommendation includes a change to the use of a contingent survivor mortality table as opposed to the current assumption that uses a general retiree table. As part of our review of experience, the contingent survivor table more appropriately reflected the mortality experience of the data.

For female contingent survivors we recommend an adjustment of 102% to the base table, developed based on the 97.7% credibility factor. Due to the low credibility of the male data, we recommend no adjustment to the base table.

Finally, in order to reflect future improvements in life expectancy, we recommend the continued use of the MP-2021 mortality projection scale, the most recent scale published by the Society of Actuaries.

The proposed beneficiary rates are included in Appendix B.

The following graphs show the actual mortality rate, expected mortality rate, and proposed mortality rate males and females combined (although as noted earlier, the mortality table will be applied on a sex-distinct basis for valuation purposes).



Pre-Retirement Mortality

The mortality experience of active members should be considered for several reasons. First, in combination with termination and disability rates, the pre-retirement mortality table enables the actuary to estimate the number of individuals who will eventually be eligible for a service retirement benefit, and thereby estimate the liability for those individuals. In addition, the death of a member before retirement may result in a benefit payable to a beneficiary, and the liability for these benefits must be taken into account in the valuation.

The current mortality assumption for active and terminated vested members is based on the Pub-2010 Public Safety Employee Mortality Table with generational projection using Scale MP-2021. The table is unadjusted for both males and females.

The experience and credibility factor over the three-year period for males and females is shown below.

Male		Female	
Deaths	**Credibility**	**Deaths**	**Credibility**
83	22.5%	2	3.7%

The following table summarizes the pre-retirement mortality experience, on a benefits-weighted basis, for the study period compared to the unadjusted base table:

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Total	**4,190**	**4,302**	**0.97**

The pre-retirement mortality experience during the study period shows that there were less deaths than expected, based on the current mortality assumption. On a benefits-weighted basis, the amount of liability released due to mortality was 97% of expected.

The following table provides a summary of pre-retirement mortality experience, on a benefits weighted basis for the study period as compared to the Pub-2016 Public Safety Employee mortality tables.

	Actual Deaths	Expected Deaths	Ratio of Actual to Expected
Total	**4,190**	**4,354**	**0.96**

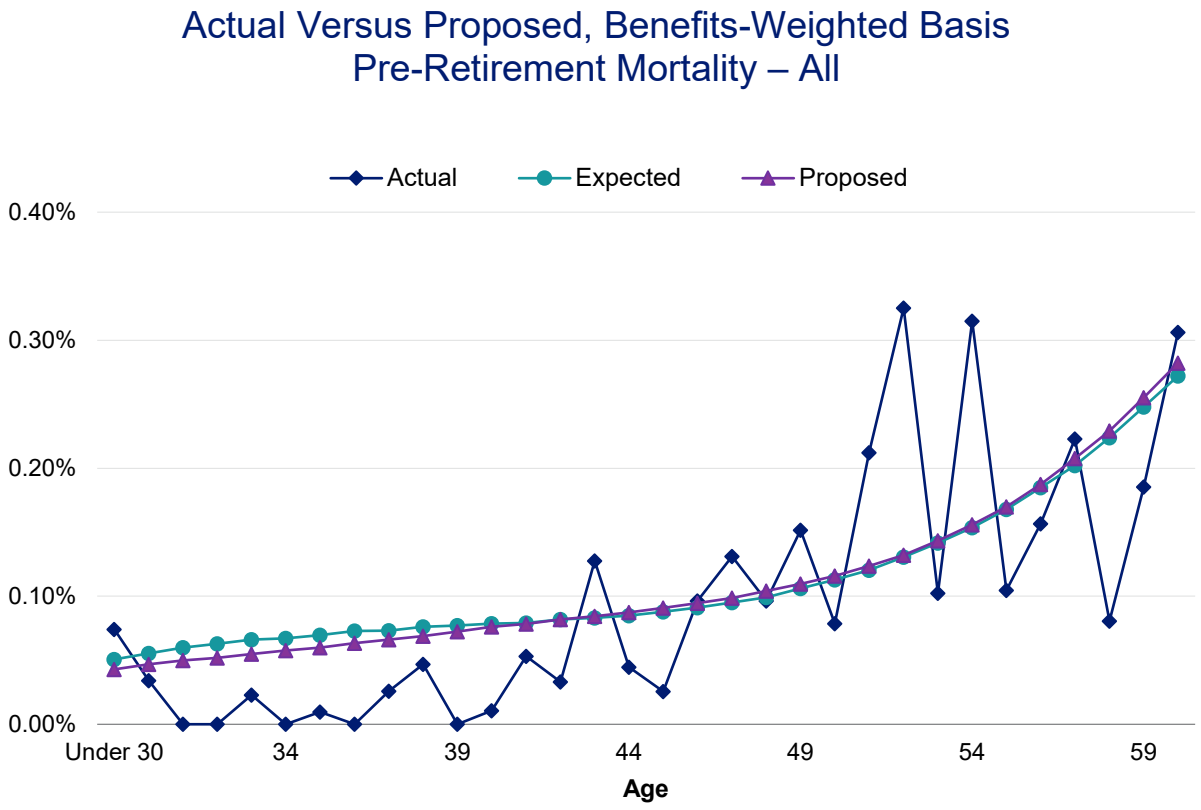
We recommend a change in the base table to the Pub-2016 Public Safety Employee Mortality Tables (sex distinct). However, because of the low credibility we recommend no adjustment to the base table.

Finally, in order to reflect future improvements in life expectancy, we recommend the continued use of the MP-2021 mortality projection scale, the most recent scale published by the Society of Actuaries.

III: Demographic Assumptions

The proposed healthy pre-retirement mortality rates are included in Appendix B.

The following graphs show the actual mortality rate, expected mortality rate, and proposed mortality rate males and females combined (although as noted earlier, the mortality table will be applied on a sex-distinct basis for valuation purposes).



The System provides an enhanced death benefit to active members who die in or from the performance of duties, also called accidental death. As a result, a separate assumption is developed regarding the percentage of accidental deaths in relation to the total deaths. The current assumption is that 5.0% of future active member deaths are accidental. Over the experience study period, 4.8% of pre-retirement deaths were accidental. **Therefore, we recommend maintaining the current assumption that 5% of deaths in active service are accidental.**

III: Demographic Assumptions

B. Retirement

Active Retirement

Under the plan, members are eligible to retire with a Service Retirement following attainment of age 55, unless they were active as of January 18, 2000. These members can retire upon the earlier of age 55 and the attainment of 20 years of Creditable Service. The plan also offers a Special Retirement which allows all members to retire upon the attainment of 25 years of Creditable Service. Finally, there is a mandatory retirement at age 65.

The current assumption for retirement from active status is based on rates by age and service. There are three separate assumptions for each age depending on the service each member has: less than 25 years, 25 years of service, or more than 25 years of service. There is not a sufficient amount of female data to evaluate retirement patterns by gender.

We have analyzed retirement patterns before mandatory retirement at 65 for each of the three groups noted above. Following is a brief discussion of our observations and recommendations for each of the three groups;

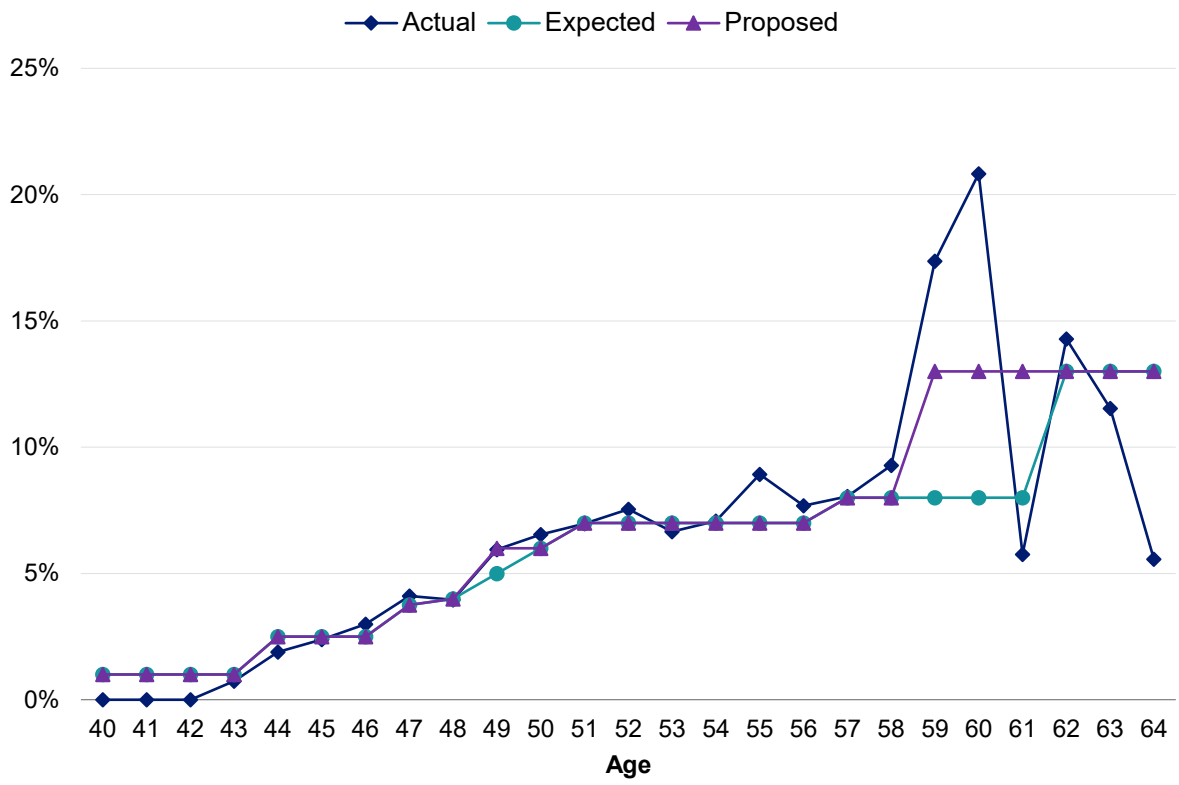
- For members with less than 25 years of service: In aggregate, there were 1,109 new retirees (below age 65) as compared to 1,040 expected based on the current assumption, or an actual to expected ratio of 1.07. Based on a review of data by age, in some cases there were more retirements than expected and in other cases less retirements than expected. **We recommend adjusting the current assumption to more closely match the actual experience over the three-year study period.** If the proposed rates had been in effect over the three-year study period, the number of expected retirements before age 65 would have been 1,077, or an actual to expected ratio of 1.03.
- For members with 25 years of service: In aggregate, there were 1,763 new retirees (below age 65) as compared to 1,571 expected based on the current assumption, or an actual to expected ratio of 1.12. Based on a review of data by age, there were more retirements than expected at most ages. **We recommend adjusting the current assumption to more closely match the actual experience over the three-year study period.** If the proposed rates had been in effect over the three-year study period, the number of expected retirements before age 65 would have been 1,740, or an actual to expected ratio of 1.01.
- For members with more than 25 years of service: In aggregate, there were 1,740 new retirees (below age 65) as compared to 1,716 expected based on the current assumption, or an actual to expected ratio of 1.01. Based on a review of data by age, the current assumption was relatively accurate at projecting the number of new retirees, except for a few ages. **We recommend adjusting the current assumption at these ages to more closely match the actual experience over the three-year study period.** If the proposed rates had been in effect over the three-year study period, the number of expected deaths before age 65 would have been 1,784, or an actual to expected ratio of 0.98.

The following tables and graphs show the actual active retirement experience for the study period compared to the current and proposed assumptions. The proposed active retirement rates for all ages by service are included in Appendix C.

Active Member Retirement, Less Than 25 Years of Service – **Unisex**

Age	Exposures	Actual Retirement Rate	Expected Retirement Rate	Ratio of Actual to Expected	Proposed Retirement Rate	Ratio of Actual to Proposed
40	263	0.00	1.00	0.00	1.00	0.00
41	500	0.00	1.00	0.00	1.00	0.00
42	832	0.00	1.00	0.00	1.00	0.00
43	1,215	0.74	1.00	0.74	1.00	0.74
44	1,639	1.89	2.50	0.76	2.50	0.76
45	1,847	2.38	2.50	0.95	2.50	0.95
46	1,940	2.99	2.50	1.20	2.50	1.20
47	1,897	4.11	3.75	1.10	3.75	1.10
48	1,817	3.96	4.00	0.99	4.00	0.99
49	1,713	5.95	5.00	1.19	6.00	0.99
50	1,622	6.54	6.00	1.09	6.00	1.09
51	1,450	6.97	7.00	1.00	7.00	1.00
52	1,273	7.54	7.00	1.08	7.00	1.08
53	1,008	6.65	7.00	0.95	7.00	0.95
54	833	7.08	7.00	1.01	7.00	1.01
55	873	8.93	7.00	1.28	7.00	1.28
56	677	7.68	7.00	1.10	7.00	1.10
57	472	8.05	8.00	1.01	8.00	1.01
58	334	9.28	8.00	1.16	8.00	1.16
59	213	17.37	8.00	2.17	13.00	1.34
60	120	20.83	8.00	2.60	13.00	1.60
61	87	5.75	8.00	0.72	13.00	0.44
62	84	14.29	13.00	1.10	13.00	1.10
63	52	11.54	13.00	0.89	13.00	0.89
64	36	5.56	13.00	0.43	13.00	0.43
Total	**22,797**	**4.86**	**4.56**	**1.07**	**4.72**	**1.03**

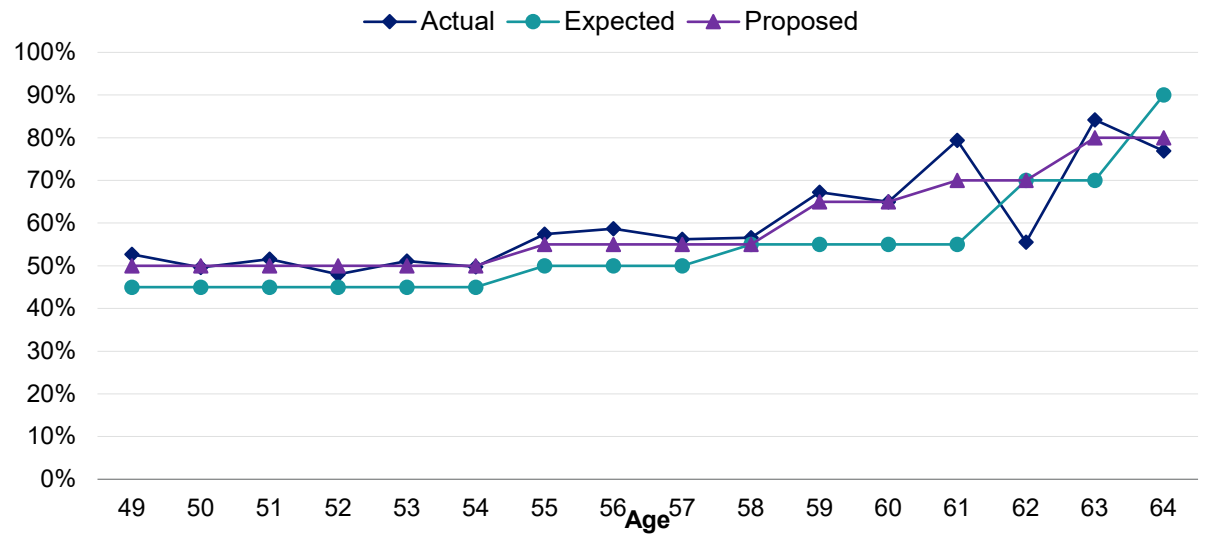
Actual Versus Proposed Experience, Benefit-Weighted Basis
Active Member Retirement, Less Than 25 Years of Service – **Unisex**



Active Member Retirement, 25 Years of Service – **Unisex**

Age	Exposures	Actual Retirement Rate	Expected Retirement Rate	Ratio of Actual to Expected	Proposed Retirement Rate	Ratio of Actual to Proposed
48 and Younger	915	49.8	45.0	1.1	50.0	1.0
49	376	52.7	45.0	1.2	50.0	1.1
50	367	49.6	45.0	1.1	50.0	1.0
51	347	51.6	45.0	1.2	50.0	1.0
52	275	48.0	45.0	1.1	50.0	1.0
53	260	51.2	45.0	1.1	50.0	1.0
54	195	49.7	45.0	1.1	50.0	1.0
55	148	57.4	50.0	1.2	55.0	1.0
56	121	58.7	50.0	1.2	55.0	1.1
57	105	56.2	50.0	1.1	55.0	1.0
58	76	56.6	55.0	1.0	55.0	1.0
59	58	67.2	55.0	1.2	65.0	1.0
60	40	65.0	55.0	1.2	65.0	1.0
61	34	79.4	55.0	1.4	70.0	1.1
62	18	55.6	70.0	0.8	70.0	0.8
63	19	84.2	70.0	1.2	80.0	1.1
64	13	76.9	90.0	0.9	80.0	1.0
Total	**3,367**	**52.4**	**46.7**	**1.1**	**51.8**	**1.0**

Actual Versus Proposed Experience, Benefit-Weighted Basis
Active Member Retirement, 25 Years of Service – **Unisex**

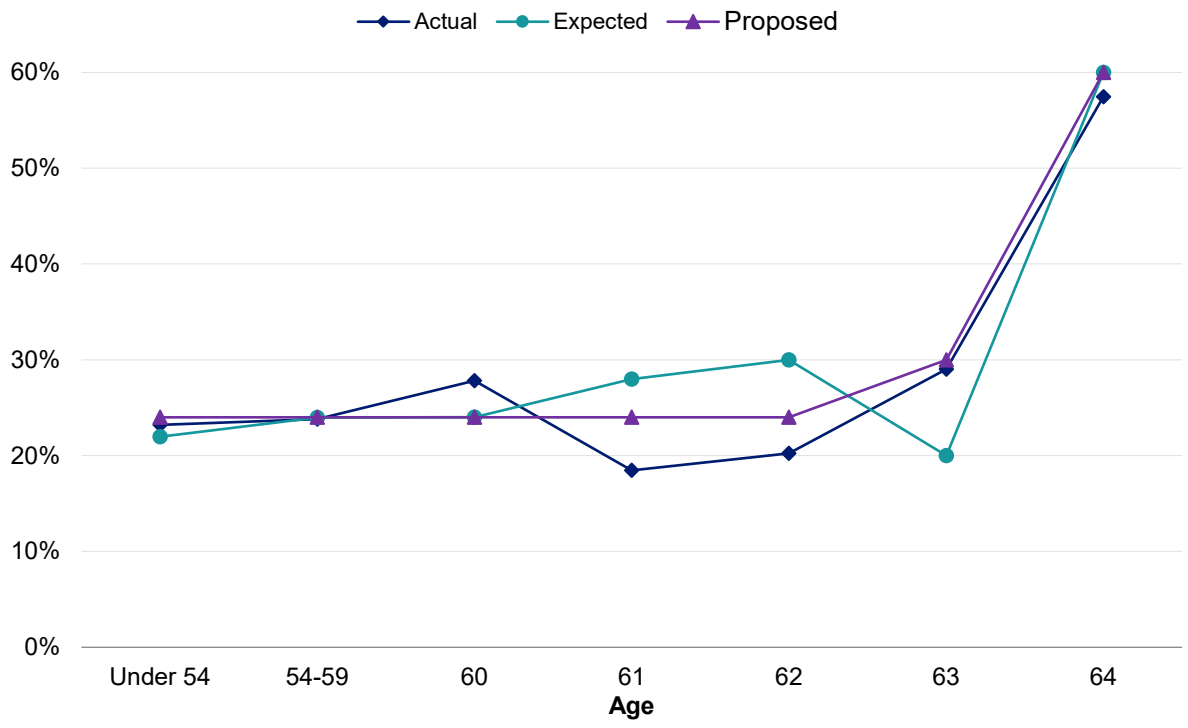


III: Demographic Assumptions

Active Member Retirement, More than 25 Years of Service – **Unisex**

Age	Exposures	Actual Retirement Rate	Expected Retirement Rate	Ratio of Actual to Expected	Proposed Retirement Rate	Ratio of Actual to Proposed
53 and younger	3,548	23.25	22.00	1.06	24.00	0.97
54-59	2,873	23.81	24.00	0.99	24.00	0.99
60	230	27.83	24.00	1.16	24.00	1.16
61	195	18.46	28.00	0.66	24.00	0.77
62	178	20.22	30.00	0.67	24.00	0.84
63	155	29.03	20.00	1.45	30.00	0.97
64	87	57.47	60.00	0.96	60.00	0.96
Total	**7,266**	**23.9**	**23.6**	**1.01**	**24.6**	**0.98**

Actual Versus Proposed Experience, Benefit-Weighted Basis
Active Member Retirement, More than 25 Years of Service – **Unisex**



C. Termination

The termination rates used in annual actuarial valuations project the percentage of employees at each age or service duration that are expected to terminate employment before retirement. These rates account for terminations for all possible causes other than retirement, death, or disability. They include both voluntary and involuntary withdrawals from service.

The System provides a deferred retirement benefit at age 55 for members who terminate prior to age 55 with ten or more years of service. A member can alternatively elect a refund of aggregate member contributions paid at termination. Members who terminate prior to earning ten years of service are only eligible for a refund of aggregate member contributions.

The termination experience study includes all terminations of active employment. Rehired members offset these terminations in order to determine the "net" terminations for each year of the study period.

The current assumption for termination uses rates based on a member's service. Historically, for PFRS, service is better indicator of the probability of termination as compared to age. In addition, there is not sufficient data regarding female members to develop sex-distinct turnover rates.

Over the three-year study period, there were 1,215 actual terminations as compared to 936 expected based on the current assumption, or an actual to expected ratio of 1.30. Based on a review of the terminations by age, **we recommend adjustments to the current termination rates to reflect the actual experience over the three-year study period.**

In the prior experience study, the termination rates were extended above age 20 to reflect the growing cohort of active members who are ineligible to retire prior to age 55 with 20 years of service. As exposure in this group increases in future years we may refine the assumption for this group.

The actual, expected, and proposed termination rates are shown in the table on the following page.

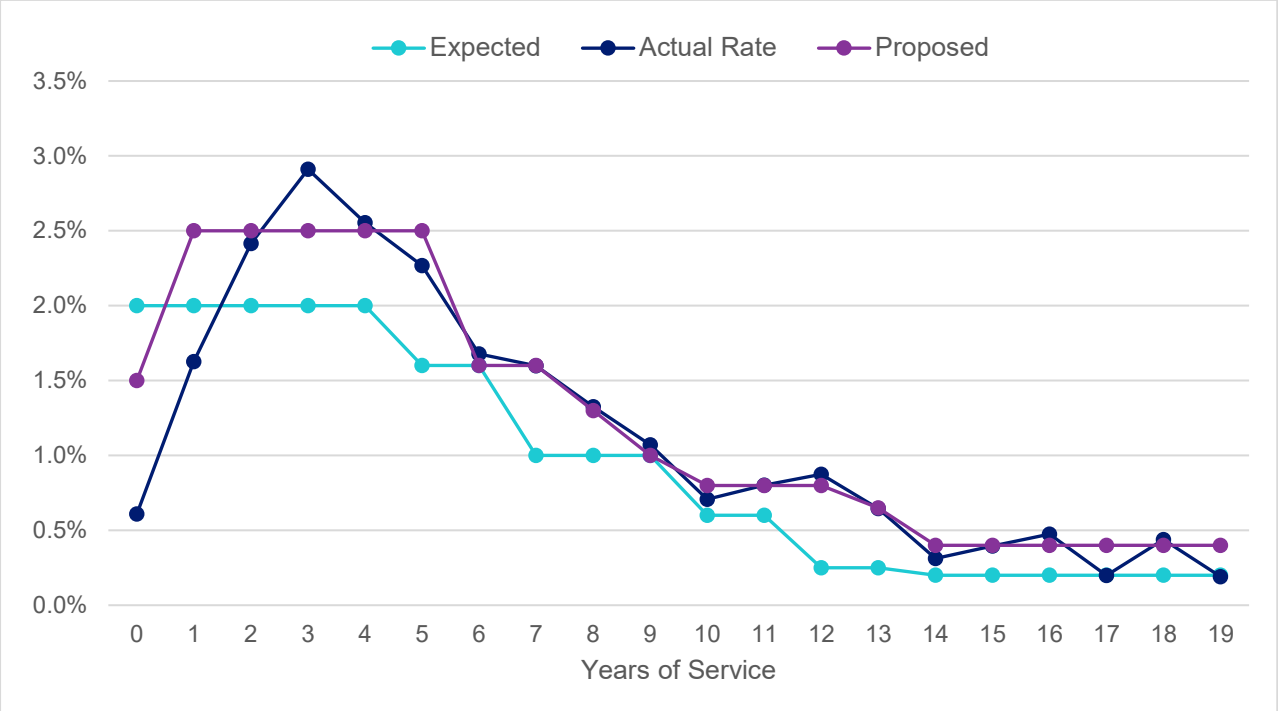
III: Demographic Assumptions

Termination Rates by Years of Service

Service	Exposures	Actual Termination Rate	Expected Termination Rate	Ratio of Actual to Expected	Proposed Termination Rate	Ratio of Actual to Proposed
0	1,314	0.61	2.00	0.30	1.50	0.41
1	4,735	1.63	2.00	0.81	2.50	0.65
2	5,136	2.41	2.00	1.21	2.50	0.97
3	5,531	2.91	2.00	1.46	2.50	1.16
4	6,304	2.55	2.00	1.28	2.50	1.02
5	6,440	2.27	1.60	1.42	2.50	0.91
6	6,316	1.68	1.60	1.05	1.60	1.05
7	5,944	1.60	1.00	1.60	1.60	1.00
8	5,580	1.33	1.00	1.33	1.30	1.02
9	4,859	1.07	1.00	1.07	1.00	1.07
10	3,957	0.71	0.60	1.18	0.80	0.88
11	2,871	0.80	0.60	1.34	0.80	1.00
12	2,516	0.87	0.30	3.50	0.80	1.09
13	2,943	0.65	0.30	2.58	0.65	0.99
14	3,852	0.31	0.20	1.56	0.40	0.78
15	4,542	0.40	0.20	1.98	0.40	0.99
16	4,849	0.47	0.20	2.37	0.40	1.19
17	4,523	0.20	0.20	0.99	0.40	0.50
18	4,102	0.44	0.20	2.19	0.40	1.10
19	1,314	0.61	0.20	0.96	0.40	0.48
20 - 24	1,417	1.34	0.20	6.70	0.40	3.35
25+	312	4.12	0.00	--	0.00	--
Total	**91,181**	**1.30**	**1.03**	**1.30**	**1.36**	**0.98**

III: Demographic Assumptions

Actual Versus Proposed Experience
Termination By Years of Service



D. Disability Retirement

Disability rate tables function in the same way as retirement rate and termination tables. The rate at each age indicates the probability of becoming disabled before the next age. Disability rates add liability for the value of the disability benefits, but lessen the value of retirement benefits ultimately payable, since anyone who becomes disabled is not projected to receive retirement benefits other than the disability benefit.

Since the plan offers two different disability benefits, ordinary and accidental there are separate assumptions for each and therefore, we have studied the incidence of those two separately. The current assumption for both ordinary and accidental disability are based on rates by age. The following table summarizes the disability experience for the plan during the study period.

Type	Exposures	Actual Disabilities	Expected Disabilities	Ratio of Actual to Expected
Ordinary	109,210	279	245	114%
Accidental	125,455	346	232	149%

For ordinary disability, there were more new disabled awards than expected as indicated by the ratio of actual to expected disabled awards of 114%. In examining the experience by age, ,the number of actual ordinary disabled awards was more been expected based on the current assumption at several ages.

Therefore, we recommend adjusting the current rates to be consistent with the actual experience in the most recent three-year study period. However, for some ages the experience during the most recent three-year study period was noticeably different than the prior study period. As a result at some ages, the experience in the most recent three-year study period was not fully weighted when determining the new assumption.

Note, if the proposed assumption had been in effect during the three-year period the expected number of ordinary disabilities would have been 278, or an actual to expected ratio of 1.00.

For accidental disability, there were significantly more new awards than expected as indicated by the ratio of actual to expected accidental disabled awards of 149%. In examining the experience by age, the number of actual accidental disabled awards was more than what would have been expected based on the current assumption, particularly above age 34..

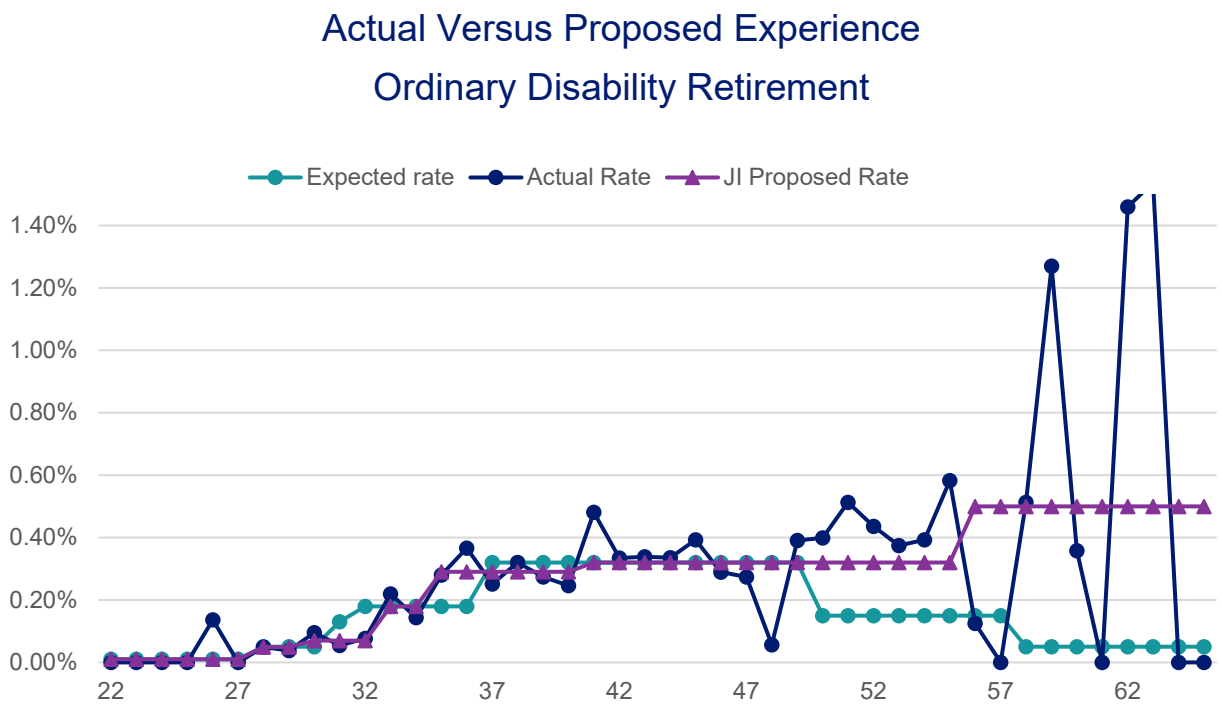
We recommend adjusting the current rates to be consistent with the actual experience in the most recent three-year study period. However, for some ages the experience during the most recent three-year study period was noticeably different than the prior study period. As a result at some ages, the experience in the most recent three-year study period was not fully weighted when determining the new assumption.

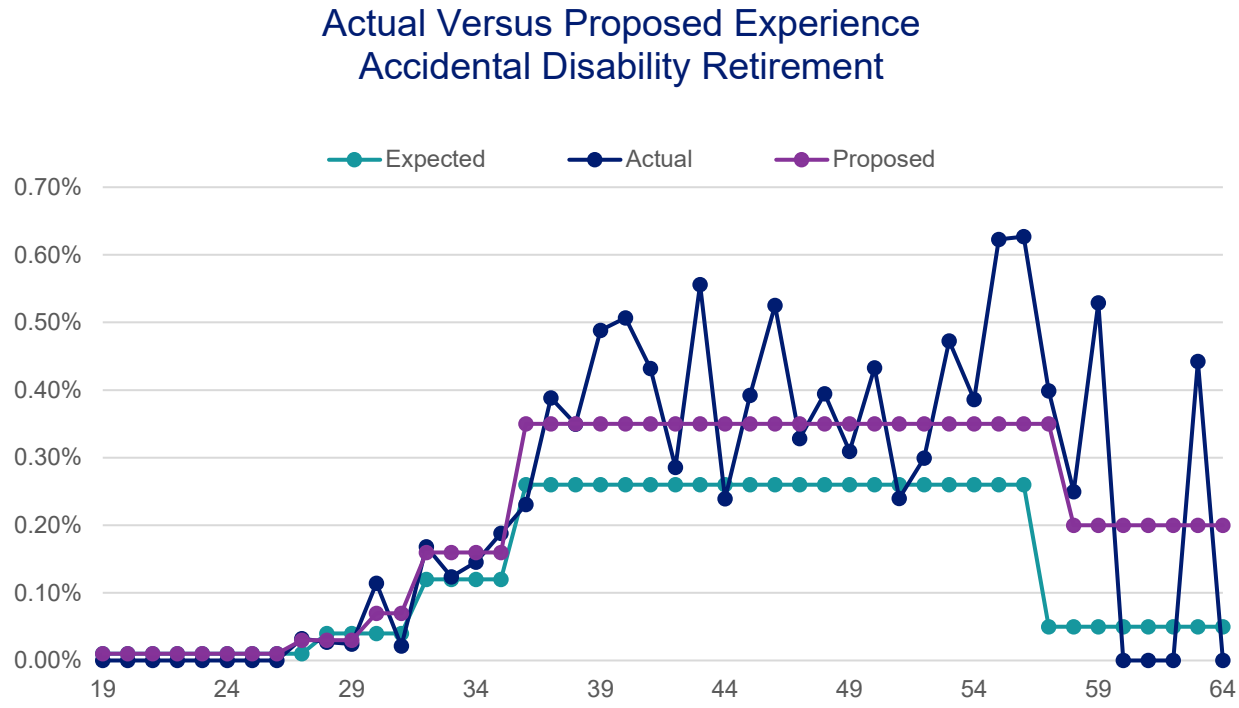
If the proposed assumption had been in effect during the prior three-year period the expected number of accidental disabilities would have been 315, producing an actual to expected ratio of 1.10.

Due to the low incidence, we recommend maintaining the assumption that no participants receive an involuntary disability benefit.

The following graphs show the actual, expected, and proposed select termination rates based on age.

III: Demographic Assumptions





The current and proposed rates are included in Appendix E. The current and proposed rates are included in Appendix E

E. Other Demographic Assumptions

Spouse and Dependent Related Assumptions

Spouse information assumptions that affect the valuation include the percentage of members married, the age difference of spouses and family composition. The current assumptions are:

- 90% of active members are married
- Male spouses are three years older than female spouses
- 100% of spouses are of the opposite gender
- Retirees with a beneficiary allowance report are assumed to be married. None are assumed to have dependent children or parents.
- Current dependents receiving a pre-retirement accidental death benefit under age 24 are assumed to receive a benefit until age 24 while those over age 24 are assumed to receive a benefit for their lifetime.
- Current dependents receiving a benefit other than a pre-retirement accidental benefit under age 19 are assumed to receive a benefit until age 19 while those over age 19 are assumed to receive a benefit for their lifetime.

We have limited data to evaluate each of these assumptions. None have a significant impact on the liability of the plan. The current assumptions are reasonable. Therefore, **we recommend no changes to the current assumptions**.

Retirement Age for Current Inactive Vested Members

Members who terminate service prior to age 55 are able to retire with a deferred retirement benefit at age 55 provided they have ten years of service and do not elect the receive a refund of their aggregate contributions as a lump sum.

The current assumption is that all deferred vested members who have not elected a refund of member contributions will elect the deferred retirement benefit at age 55. As of July 1, 2024 there were 67 inactive vested participants who were eligible for a deferred benefit that did not elect a refund..

There is limited data for this group to enable the development of an alternative retirement age assumption or rates by age. In addition, based on the plan design there is no incentive for deferred vested member to delay commencement beyond age 55. As a result of this limited data and due to the fact that the current assumption is reasonable and consistent with the plan design, **we recommend no changes to the current assumption.**

Future Inactive Vested Member Form of Payment Election

The plan allows for those who terminate prior to age 55 with more than ten years of service to elect their benefit be deferred to age 55 and paid as annuity. In lieu of the deferred benefit members can elect to have their aggregate contributions refunded, paid immediately as a lump sum.

The current assumption, for current active members who may terminate in the future, is that all terminations elect their benefit to be paid immediately as a lump sum, or 0% elect to defer their benefit to age 55.

Historically, a very low percentage of members elect to defer the benefit to age 55 upon termination. Over the prior two study periods, it has been observed that an increasing number of members elect to defer commencement to age 55. However, the amount of data is limited and therefore, it is difficult to develop a reasonable alternative assumption. Due to this and the fact that this assumption is not material to the liability of the plan **we recommend maintaining the assumption that no eligible inactive vested members opt for the deferred benefit rather than the lump sum cash out at termination.** We will continue to monitor this assumption and may revise in the future based on emerging experience.

IV. Appendix

Appendix A: Proposed Salary Increases

Service	Current Total Salary Increase Rate[1]	Proposed Total Salary Increase Rate[1]
0	16.25	17.50
1	14.00	15.25
2	12.00	13.25
3	12.00	13.25
4	12.00	13.00
5	11.00	12.00
6	10.00	11.00
7	9.00	10.00
8	8.00	9.00
9	7.00	8.00
10	6.00	7.00
11	5.00	6.00
12	5.00	6.00
13	4.00	5.50
14	4.00	5.50
15	4.00	5.50
16	4.00	5.50
17	3.25	5.00
18	3.25	5.00
19	3.25	5.00
20	3.25	4.75
21	3.25	4.75
22	3.25	4.75
23	3.25	4.75
24	3.25	4.75
25+	3.25	4.00

[1] Includes 3.25% inflation and productivity for current rates and 3.0% for proposed rates.

Appendix B: Proposed Mortality Rates

Healthy Post-Retirement Mortality[1]

	Male		Female	
Age	Current Mortality Rates	Proposed Mortality Rates	Current Mortality Rates	Proposed Mortality Rates
50	0.32	0.29	0.15	0.16
55	0.48	0.41	0.27	0.26
60	0.76	0.64	0.50	0.43
65	1.15	1.06	0.79	0.72
70	1.81	1.72	1.25	1.18
75	3.01	2.81	2.16	2.09
80	5.26	4.79	3.89	3.89
85	9.25	8.46	6.91	7.26
90	15.68	14.82	12.11	13.39
95	22.71	23.63	18.42	19.94
100	30.94	34.05	26.88	27.55

Beneficiary Post-Retirement Mortality[1]

	Male		Female	
Age	Current Mortality Rates	Proposed Mortality Rates	Current Mortality Rates	Proposed Mortality Rates
50	0.68	0.75	0.38	0.34
55	0.87	0.86	0.47	0.49
60	1.12	1.17	0.55	0.75
65	1.32	1.64	0.66	1.09
70	1.93	2.31	1.04	1.57
75	3.10	3.41	1.83	2.41
80	5.27	5.47	3.35	4.01
85	9.26	9.13	6.29	6.97
90	15.20	15.99	11.62	12.09
95	21.94	24.46	18.31	19.29
100	30.73	34.05	27.06	28.68

[1] Current and proposed mortality rates above are sample rates for 2025. For actuarial valuation purposes, proposed mortality rates will be projected from 2016 on a generational basis using MP-2021 improvement scale.

Appendix B: Proposed Mortality Rates

Disabled Post-Retirement Mortality[1]

	Male		Female	
Age	Current Mortality Rates	Proposed Mortality Rates	Current Mortality Rates	Proposed Mortality Rates
40	0.33	0.34	0.19	0.19
45	0.37	0.41	0.22	0.25
50	0.48	0.52	0.28	0.33
55	0.66	0.66	0.46	0.43
60	1.09	0.91	0.73	0.59
65	1.72	1.43	1.01	0.97
70	2.54	2.31	1.41	1.62
75	4.15	3.76	2.16	2.72
80	7.22	6.72	3.62	4.96
85	12.18	12.16	6.32	7.66
90	21.38	20.34	11.28	12.26
95	32.30	31.54	17.90	19.40

Healthy Pre-Retirement Mortality[1]

	Male		Female	
Age	Current Mortality Rates	Proposed Mortality Rates	Current Mortality Rates	Proposed Mortality Rates
25	0.04	0.04	0.02	0.02
30	0.06	0.05	0.04	0.03
35	0.07	0.06	0.05	0.04
40	0.08	0.08	0.06	0.05
45	0.09	0.09	0.06	0.07
50	0.11	0.12	0.08	0.09
55	0.17	0.17	0.12	0.14
60	0.27	0.28	0.17	0.22
65	0.41	0.47	0.22	0.34

[1] Current and proposed mortality rates above are sample rates for 2025. For actuarial valuation purposes, proposed mortality rates will be projected from 2016 on a generational basis using MP-2021 improvement scale.

Appendix C: Proposed Retirement Rates

Proposed Retirement (Unisex)

	Less than 25 Years of Service		25 Years of Service		More than 25 Years of Service	
Age	**Current**	**Proposed**	**Current**	**Proposed**	**Current**	**Proposed**
40	1.00	1.00	45.00	50.00	22.00	24.00
41	1.00	1.00	45.00	50.00	22.00	24.00
42	1.00	1.00	45.00	50.00	22.00	24.00
43	1.00	1.00	45.00	50.00	22.00	24.00
44	2.50	2.50	45.00	50.00	22.00	24.00
45	2.50	2.50	45.00	50.00	22.00	24.00
46	2.50	2.50	45.00	50.00	22.00	24.00
47	3.75	3.75	45.00	50.00	22.00	24.00
48	4.00	4.00	45.00	50.00	22.00	24.00
49	5.00	6.00	45.00	50.00	22.00	24.00
50	6.00	6.00	45.00	50.00	22.00	24.00
51	7.00	7.00	45.00	50.00	22.00	24.00
52	7.00	7.00	45.00	50.00	22.00	24.00
53	7.00	7.00	45.00	50.00	22.00	24.00
54	7.00	7.00	45.00	50.00	24.00	24.00
55	7.00	7.00	50.00	55.00	24.00	24.00
56	7.00	7.00	50.00	55.00	24.00	24.00
57	8.00	8.00	50.00	55.00	24.00	24.00
58	8.00	8.00	55.00	55.00	24.00	24.00
59	8.00	13.00	55.00	65.00	24.00	24.00
60	8.00	13.00	55.00	65.00	24.00	24.00
61	8.00	13.00	55.00	70.00	28.00	24.00
62	13.00	13.00	70.00	70.00	30.00	24.00
63	13.00	13.00	70.00	80.00	20.00	30.00
64	13.00	13.00	90.00	80.00	60.00	60.00
65	100.00	100.0	100.00	100.00	100.00	100.00

Appendix D: Proposed Termination Rates

Years Of Service	Current Rate of Termination	Proposed Rate of Termination
0	2.00	1.50
1	2.00	2.50
2	2.00	2.50
3	2.00	2.50
4	2.00	2.50
5	1.60	2.50
6	1.60	1.60
7	1.00	1.60
8	1.00	1.30
9	1.00	1.00
10	0.60	0.80
11	0.60	0.80
12	0.25	0.80
13	0.25	0.65
14	0.20	0.40
15	0.20	0.40
16	0.20	0.40
17	0.20	0.40
18	0.20	0.40
19	0.20	0.40
20	0.20	0.40
21	0.20	0.40
22	0.20	0.40
23	0.20	0.40
24	0.20	0.40
25+	0.00	0.00

Appendix E: Proposed Disability Retirement Rates

	Ordinary		Accidental	
Age	Current Disability Rates	Proposed Disability Rates	Current Disability Rates	Proposed Disability Rates
20	0.01	0.01	0.01	0.01
21	0.01	0.01	0.01	0.01
22	0.01	0.01	0.01	0.01
23	0.01	0.01	0.01	0.01
24	0.01	0.01	0.01	0.01
25	0.01	0.01	0.01	0.01
26	0.01	0.01	0.01	0.01
27	0.01	0.01	0.01	0.03
28	0.05	0.05	0.04	0.03
29	0.05	0.05	0.04	0.03
30	0.05	0.07	0.04	0.07
31	0.13	0.07	0.04	0.07
32	0.18	0.07	0.12	0.16
33	0.18	0.18	0.12	0.16
34	0.18	0.18	0.12	0.16
35	0.18	0.29	0.12	0.16
36	0.18	0.29	0.26	0.35
37	0.32	0.29	0.26	0.35
38	0.32	0.29	0.26	0.35
39	0.32	0.29	0.26	0.35
40	0.32	0.29	0.26	0.35
41	0.32	0.32	0.26	0.35
42	0.32	0.32	0.26	0.35
43	0.32	0.32	0.26	0.35
44	0.32	0.32	0.26	0.35
45	0.32	0.32	0.26	0.35
46	0.32	0.32	0.26	0.35
47	0.32	0.32	0.26	0.35
48	0.32	0.32	0.26	0.35
49	0.32	0.32	0.26	0.35
50	0.15	0.32	0.26	0.35
51	0.15	0.32	0.26	0.35
52	0.15	0.32	0.26	0.35
53	0.15	0.32	0.26	0.35

	Ordinary		Accidental	
Age	Current Disability Rates	Proposed Disability Rates	Current Disability Rates	Proposed Disability Rates
54	0.15	0.32	0.26	0.35
55	0.15	0.32	0.26	0.35
56	0.15	0.25	0.26	0.35
57	0.15	0.25	0.05	0.35
58	0.05	0.25	0.05	0.20
59	0.05	0.25	0.05	0.20
60	0.05	0.25	0.05	0.20
61	0.05	0.25	0.05	0.20
62	0.05	0.25	0.05	0.20
63	0.05	0.25	0.05	0.20
64	0.05	0.25	0.05	0.20

END OF REPORT