State Universities Retirement System of Illinois

2024 Experience Review Covering the Period
June 30, 2020, to June 30, 2023

GRS

May 23, 2024

Board of Trustees
State Universities Retirement System of Illinois
1901 Fox Drive
Champaign, Illinois 61820

Subject: Experience Review Covering the Period June 30, 2020, to June 30, 2023

Dear Members of the Board:

At your request, we have performed a review of the actuarial assumptions used in the annual actuarial valuation of the State Universities Retirement System of Illinois ("SURS"). The primary purpose of the study is to determine the continued appropriateness of the current actuarial assumptions by comparing actual experience to expected experience. Our study was based on census information for the period from June 30, 2020, to June 30, 2023, as provided by SURS Staff.

Our study includes a review of the experience associated with the following actuarial assumptions:

- Price Inflation;
- Investment Return;
- Salary Increases;
- Wage Inflation (based on uncapped pay);
- Effective Rate of Interest;
- Mortality;
- Disability;
- Withdrawal; and
- Retirement.

The results of this analysis are set forth in Section II of this report. Section III contains the cost impact on the Statutory contribution and funded status of the plan as a result of the assumption modifications. Finally, Section IV contains a summary of all proposed rates.

Amy Williams and Kevin Noelke are Members of the American Academy of Actuaries ("MAAA") and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Board of Trustees
State Universities Retirement System of Illinois
Page 2

The signing actuaries are independent of the plan sponsor.

This report should not be relied on for any purpose other than the purpose stated. This report may be provided to parties other than SURS only in its entirety and only with the permission of SURS. GRS is not responsible for unauthorized use of this report.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report is based upon information, furnished to us by SURS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

The results of the experience study and recommended assumptions set forth in this report are based on the data and actuarial techniques and methods described above, and upon the provisions of SURS as of the most recent valuation date, June 30, 2023. To the best of our knowledge, the information contained in this report is accurate and fairly presents the experience of members participating in the SURS defined benefit plans for the period June 30, 2020, through June 30, 2023. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

Amy Williams, ASA, EA, FCA, MAAA
Senior Consultant

Kevin Noelke, ASA, FCA, MAAA
Consultant

AW/KN:ah

Table of Contents

SECTION I

EXPERIENCE REVIEW SUMMARY

Experience Review Summary

Background

For any pension plan, actuarial assumptions are selected that are intended to provide reasonable estimates of future expected events, such as System investment returns, interest crediting, and patterns of retirement, turnover and mortality. These assumptions, along with an actuarial cost method, the employee census data and the plan's provisions are used to determine the actuarial liabilities and overall actuarially determined funding requirements for the plan. The true cost to the plan over time will be the actual benefit payments and expenses required by the plan's provisions for the participant group under the plan. To the extent the actual experience deviates from the assumptions, experience gains and losses will occur. These gains (losses) then serve to reduce (increase) future actuarially determined contributions and increase (reduce) the funded ratio. The actuarial assumptions should be individually reasonable and consistent in the aggregate. They should also be reviewed periodically to ensure that they remain appropriate. The actuarial cost method, for plan sponsors that use actuarially based funding policies, automatically adjusts contributions over time for differences between what is assumed and the actual experience under the plan.

Actuarial Standards of Practice ("ASOPs")

The Actuarial Standards Board ("ASB") provides guidance on measuring the costs of financing a retirement program through the following Actuarial Standards of Practices ("ASOPs"):

(1) ASOP No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*;
(2) ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*;
(3) ASOP No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*;
(4) ASOP No. 44, *Selection and Use of Asset Valuation Methods for Pension Valuations*;
(5) ASOP No. 51, *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions;* and
(6) ASOP No. 56, *Modeling.*

The recommendations provided in this report are consistent with the preceding actuarial standards of practice.

Assumptions Reviewed

The actuarial assumptions are usually divided into two categories:

(1) Economic assumptions, which include:

- Assumed rate of price inflation (as measured by the change in the Consumer Price Index for all urban consumers)
  - Underlies all other economic assumptions
  - Basis for cost-of-living increases for members hired on or after January 1, 2011
- Assumed long-term rate of return on investments (prescribed rate as defined in statute)
  - Rate at which projected benefits are reduced to present value
  - Basis for money purchase annuity factors

- Assumed effective rate of interest (rate at which member contributions are accumulated to generate benefits under the Money Purchase Benefit formula – Rule 2)
- General wage increases
  - Reflects inflationary forces on increases in pay for all members

The economic assumptions are generally chosen on the basis of the actuary's expectations as to the effect of future economic conditions on the operation of the plan, with input from Staff, the Board and other investment advisors.

The economic assumptions will be reviewed later this spring. This study includes review of the demographic assumptions.

(2) Demographic assumptions, which include the following rates:

- Mortality;
- Retirement;
- Disablement; and
- Withdrawal (other termination of employment).

Demographic assumptions are generally based on the plan's own experience, taking into account emerging trends. Rates of salary increase due to promotion and longevity are also related to the plan's experience.

The accuracy and extent of the data is an important consideration in assessing demographic experience. The accuracy of the data for this study was generally good, but a very large amount of data is required to develop a credible mortality table. The approach we have taken to recommending a mortality assumption for the SURS actuarial valuation is based on the model described by the Society of Actuaries (SOA). In effect, we select a base mortality table from the Pub-2010 mortality tables and a mortality improvement scale. We then use what is termed "the limited fluctuation credibility procedure" to determine the appropriate scaling factor of the base mortality tables for each gender and each member classification.

(3) Other methods and assumptions including the following:
   a. Cost method;
   b. Amortization method;
   c. Asset smoothing method;
   d. Dependent assumptions;
   e. Assumptions on reciprocal service and service purchases;
   f. Assumptions on refund of contributions vs. deferred annuity;
   g. Pay increase and decrement timing assumptions; and
   h. Plan election assumptions (Traditional/Portable vs. Retirement Savings Plan).

Key Findings and Recommendations

Gabriel, Roeder, Smith & Company ("GRS") has performed an experience study of the State Universities Retirement System of Illinois ("SURS") for the period from June 30, 2020, to June 30, 2023. The primary

purpose of the study was to compare the SURS plan experience and future expectations for experience against the actuarial assumptions used in the actuarial valuation. Our study was based on the information used to perform the annual actuarial valuations for the period from June 30, 2020, to June 30, 2023.

Following is a summary of the key findings and recommendations:

- **Price inflation**: We recommend increasing the rate of assumed inflation from 2.25% to 2.40%.

- **Investment return**: We recommend maintaining the investment return assumption at 6.50%. This reflects increasing the underlying assumed price inflation from 2.25% to 2.40% and decreasing the assumed real rate of return from 4.25% to 4.10%. We will monitor the assumptions for continued reasonableness in the future.

- **General wage inflation assumption**: We recommend increasing the general wage inflation assumption from 3.00% to 3.15%. This reflects maintaining the assumed rate for productivity increases of 0.75% and increasing the underlying assumed price inflation from 2.25% to 2.40%.

- **Salary increase**: We recommend modifying the overall assumed salary increase rates to reflect a small overall increase, having separate rates for Academic and Non-Academic employees and maintaining the current salary increase rate structure of different salary increase rates for employees younger than age 50 and age 50 and older.

- **Effective rate of interest assumption:** We recommend increasing the long-term assumption for the ERI for crediting the money purchase accounts from 6.50% per year to 7.00% per year.

- **Normal retirement rates:** We recommend maintaining separate rates for members in Academic positions than for members in Non-Academic positions and making minor adjustments to the rates. The overall rates for Academic members are lower and the overall rates for Non-Academic members are higher than under our current assumptions based on the observed experience.

- **Early retirement rates:** We recommend maintaining separate rates for members in Academic positions than for members in Non-Academic positions. The overall rates for Academic members are lower and the overall rates for Non-Academic members are higher than under our current assumptions based on the observed experience.

- **Turnover rates:** We recommend maintaining separate rates for members in Academic positions than for members in Non-Academic positions. In total, the proposed turnover rates produce fewer expected number of terminations than the current turnover rates for both Academic and Non-Academic members.

- **Mortality rates:** We recommend:

  - Continuing to use the Pub-2010 Mortality tables that are based on public sector pension plan experience;

  - Continuing to use the Pub-2010 Mortality tables for Teachers for the Academic non-disabled members, continuing to use the Pub-2010 Mortality tables for General Employees for the Non-Academic (non-Police) non-disabled members and using the Pub-2010 Mortality tables for Safety Employees for the Non-Academic (Police) non-disabled members;

  - Using the Pub-2010 Disabled Mortality table for Non-Safety Employees for both Academic and Non-Academic disabled members;

Experience Review Summary

- Updating the projection scale from the MP-2020 to the MP-2021 scale (the most recent projection scale);

- Maintaining the MP-2021 projection scale until the assumptions are studied with the next experience study; and

- Applying certain scaling factors to the base tables based on the actual experience for the period June 30, 2017, through June 30, 2020 and June 30, 2021, through June 30, 2023 and the credibility that can be applied to that experience.

The specific mortality table recommendations and a more detailed description of the new mortality tables can be found in Section II.

- **Disability rates:** We recommend maintaining separate rates for members in Academic positions and members in Non-Academic positions and maintaining separate rates for males and females. We recommend using 200% of the Non-Academic rates for the Police group. We recommend no change to the current disability rates for males and slight decreases for females based on observed experience.

- **Money purchase conversion factor assumptions**: By statute, the money purchase conversion factors are to be updated when the investment return assumption and/or the mortality assumption are updated. Therefore, the recommended changes will result in updates to the money purchase conversion factors. The effective date of the updated money purchase conversion factors will be determined by the Board and historically has been about one year after the valuation date in which the updated assumptions are reflected. We recommend a blended mortality assumption be used for purposes of the money purchase conversion factors that would apply to both Academic and Non-Academic members.

- **Plan Election**: We recommend maintaining the plan election assumptions that for the Non-Academic members, 75% elect Tier 2 and 25% elect to participate in the Retirement Savings Plan (RSP), and for the Academic members, 55% elect Tier 2 and 45% elect to participate in the Retirement Savings Plan (RSP).

- **Load for reciprocal benefits, service purchases and refunds of excess contributions**: We recommend maintaining the liability load of 10% on the liabilities for service retirees whose benefits have not been finalized and a "best formula" benefit has not been provided and a 5% load if a "best formula" benefit has been provided.

- **Pay increases during the final rate of earnings period (used for 6% employer billing contributions)**: We recommend maintaining the current assumption that pay increases will be lower than 6.00% during the final average earnings period and therefore there will be no contributions received or liability losses generated by members receiving pay increases in excess of 6.00% during the final average earnings period.

- **Buyout election assumptions:** We recommend maintaining the buyout election assumption of 0% until the program ends or conditions change. This means that the savings from the buyout program will be recognized each year as they occur – a common approach for this type of program.

Experience Review Summary

The actuarial cost method, asset smoothing method and amortization method are set in statute. We have commented on the statutorily required methods and made recommendations outside of this report.

Section III contains the cost impact on the Statutory contribution and funded status of the plan based on the recommended assumptions. The recommended assumptions increase the actuarial liability and Statutory contribution and decrease the funded ratio.

In order to maintain the fiscal health of SURS, and to comply with the Actuarial Standards of Practice (applicable to all actuaries who practice in the United States), it is important to select actuarial assumptions that reflect reasonable estimates of future investment returns.

One factor to keep in mind is that Public Act 100-0023 requires any change in an actuarial assumption that increases or decreases the required State contribution to be implemented in equal annual amounts over a five-year period beginning in the state fiscal year in which the change first applies to the required state contribution. Any contribution increases attributable to changes in actuarial assumptions first effective in the June 30, 2024, actuarial valuation will be recognized over five years beginning with the fiscal year 2026 Statutory contribution.

SECTION II

EXPERIENCE ANALYSIS

Economic Assumptions

Economic assumptions reflect the effects of economic forces on the projections of retirement benefits payable from the plan and in the discounting of those benefits to present value.

These assumptions are based, at their core, on the assumed level of price inflation. Each economic assumption is then developed from expected spreads over price inflation. Since price inflation is relatively volatile and is subject to a number of influences not based on recent history, economic assumptions are less reliably based on recent past experience than are the demographic assumptions.

The key economic assumptions are:

1. Assumed Rate of Inflation – The rate of price inflation (as measured by the Consumer Price Index for all Urban consumers) which underlies the remainder of the economic assumptions.
2. Assumed Rate of Investment Return – The rate at which projected future benefits under the system are reduced to present value.
3. Rate of General Annual Pay Increases – This reflects inflationary forces on increases in pay for individual members.

Actuarial Standard of Practice No. 27

ASOP No. 27 provides guidance related to selecting economic assumptions, including the investment return, discount rate, inflation, postemployment benefit increases, compensation increases and any other related economic assumptions, such as the Effective Rate of Interest (ERI) assumption.

In developing specific actuarial assumptions, ASOP No. 27 requires the actuary to follow a general process of:

1. Identifying the components of the assumption;
2. Evaluating relevant data;
3. Considering specific and general factors related to the measurement; and
4. Selecting a reasonable assumption.

In evaluating relevant data, the actuary should include appropriate recent and long-term historic data, but not give undue weight to recent experience.

Further, under ASOP No. 27, an assumption is considered reasonable if:

- It is appropriate for the purpose of the measurement;
- It reflects the actuary's professional judgment;
- It takes into account historical and current economic data that is relevant as of the measurement date;
- It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and
- It has no significant bias (i.e., it is not significantly optimistic or pessimistic).

Also according to the ASOP No. 27, the actuary should recognize the uncertain nature of the items for which assumptions are selected and, as a result, may consider several different assumptions reasonable

Economic Assumptions

for a given measurement. The actuary should also recognize that different actuaries will apply different professional judgment and may choose different reasonable assumptions. As a result, a range of reasonable assumptions may develop both for an individual actuary and across actuarial practice.

Inflation

By "inflation," we mean price inflation, as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies all of the other economic assumptions we employ. It not only impacts investment return, but also salary increase rates and the general wage inflation assumption. The current annual inflation assumption is 2.25%.

Over the five-year period from June 2018 through June 2023, the CPI-U has increased at an average rate of 3.90%. However, please remember that the assumed inflation rate is only weakly tied to past results.

The following table shows the average inflation over various periods, ending June 2023.

Fiscal Year	Annual Increase in CPI-U
2018-19	1.65%
2019-20	0.65%
2020-21	5.39%
2021-22	9.06%
2022-23	2.97%
3-Year Average	5.78%
5-Year Average	3.90%
10-Year Average	2.71%
20-Year Average	2.57%
25-Year Average	2.54%
30-Year Average	2.52%
40-Year Average	2.84%
50-Year Average	3.94%

The graph on the next page shows the average annual inflation, as measured by the increase in CPI-U, in each of the 10 consecutive 5-year periods over the last 50 years.

**Average Annual Inflation
CPI-U Five Fiscal Year Averages**
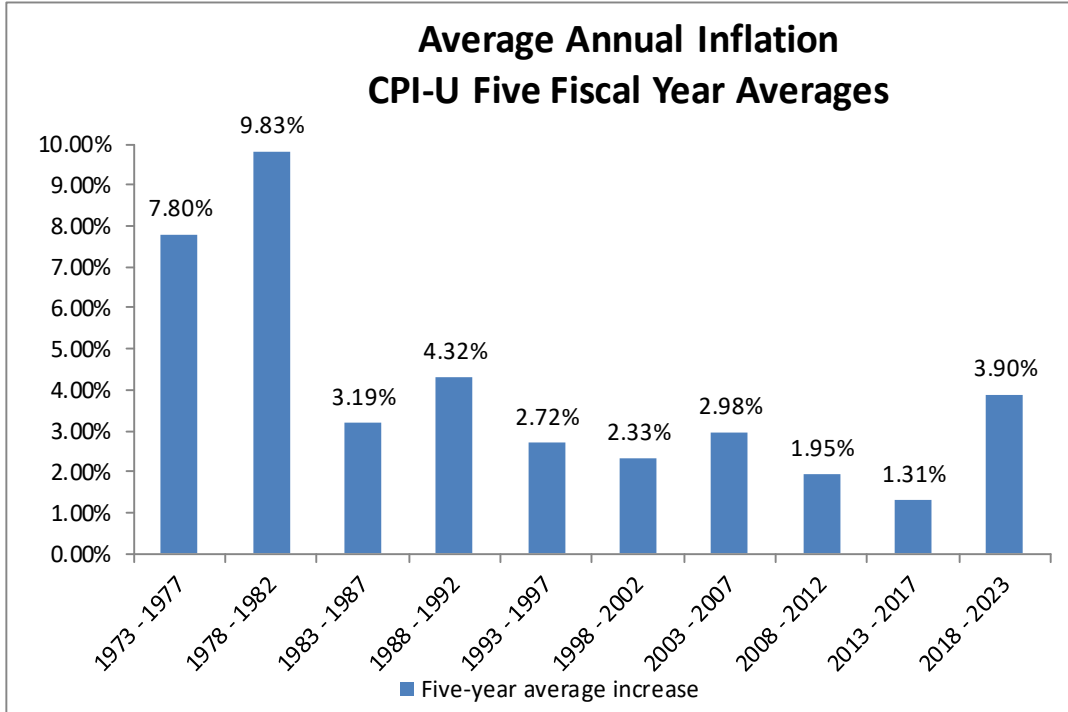
The geometric average annual increase in price inflation was 2.52% per year over the last 30 years from June 1993 to June 2023, 2.57% over the last 20 years and 2.71% over the last 10 years.

The following graph illustrates the rate of inflation on a year by year basis over the last 30 years.
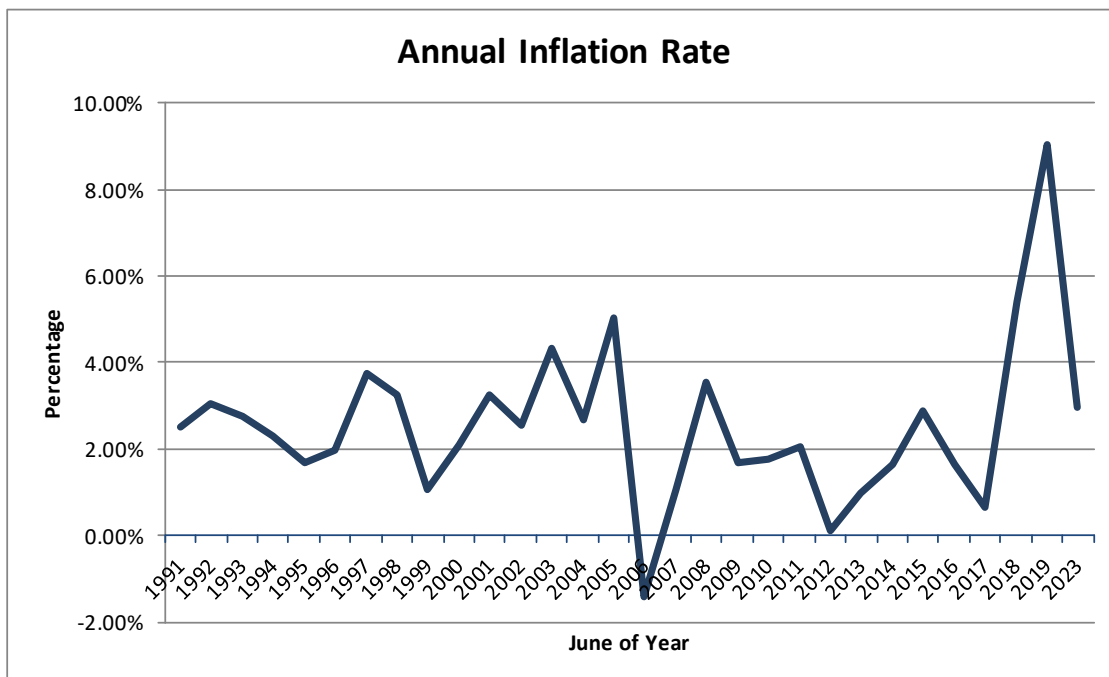
Annual Inflation Rate

Since price inflation is relatively volatile and is subject to a number of influences not based on recent history, economic assumptions are less reliably based on recent past experience than are the demographic

Economic Assumptions

assumptions. Therefore, it is important not to give undue weight to recent experience. We must also consider future expectations as well.

Another source of information about future inflation is the market for US Treasury bonds. As of May 10, 2024, the 5- and 10-year Breakeven Inflation Rates as reported by the Federal Reserve Bank of St. Louis were both 2.34%.

We also surveyed the inflation assumption used by nationally recognized financial firms (investment consultants, asset managers and insurance companies) across the country. In our sample of these firms, the inflation assumption ranged from 2.13% to 2.70%, with an average of 2.39%.

Financial Firm	Financial Firm Inflation Assumption
1	2.60%
2	2.70%
3	2.25%
4	2.50%
5	2.40%
6	2.44%
7	2.20%
8	2.21%
9	2.21%
10	2.51%
11	2.51%
12	2.13%
Average	**2.39%**

Another point of reference is the Social Security Administration's (SSA) 2023 Trustees Report, in which the Office of the Chief Actuary is projecting a long-term average ultimate annual inflation rate of 1.8% in the high cost projection scenario, 2.4% under the intermediate cost projection scenario and 3.0% in the low cost projection scenario. The Social Security Trustees report uses the ultimate rates for their 75-year projections, much longer than the longest horizon we can discern from Treasuries and TIPS.

The following table presents a summary of inflation rate forecasts from various professional experts.

Economic Assumptions

Forward-looking Annual Inflation Forecasts[a]	
Congressional Budget Office[b]	
5-Year Annual Average	2.32%
10-Year Annual Average	2.26%
Federal Reserve Bank of Philadelphia[c]	
5-Year Annual Average	2.30%
10-Year Annual Average	2.24%
Federal Reserve Bank of Cleveland[d]	
10-Year Expectation	2.22%
20-Year Expectation	2.31%
30-Year Expectation	2.39%
Federal Reserve Bank of St. Louis[e]	
10-Year Breakeven Inflation	2.31%
20-Year Breakeven Inflation	2.45%
30-Year Breakeven Inflation	2.27%
U.S. Department of the Treasury[f]	
10-Year Breakeven Inflation	2.21%
20-Year Breakeven Inflation	2.43%
30-Year Breakeven Inflation	2.26%
50-Year Breakeven Inflation	2.36%
100-Year Breakeven Inflation	2.44%
Social Security Trustees[g]	
Ultimate Intermediate Assumption	2.40%

[a] End of the First Quarter, 2024. Version 2024-04-16 by Gabriel, Roeder, Smith & Company.

[b] *An Update to the Economic Outlook: 2024 to 2034*, Release Date: February 2024, Consumer Price Index (CPI-U), Percentage Change from Year to Year, 5-Year Annual Average (2024 - 2028), 10-Year Annual Average (2024 - 2033).

[c] *First Quarter 2024 Survey of Professional Forecasters,* Release Date: February 9, 2024, Headline CPI, Annualized Percentage Points, 5-Year Annual Average (2024 - 2028), 10-Year Annual Average (2024 - 2033).

[d] Inflation Expectations, Model output date: March 1, 2024.

[e] The breakeven inflation rate represents a measure of expected inflation derived from X-Year Treasury Constant Maturity Securities and X-Year Treasury Inflation-Indexed Constant Maturity Securities. Observation date: March, 2024.

[f] *The Treasury Breakeven Inflation (TBI) Curve*, Monthly Average Rates, March, 2024.

[g] *The 2023 Annual Report of The Board of Trustees of The Federal Old-Age And Survivors Insurance and Federal Disability Insurance Trust Funds*, March 31, 2023, p. 10, Key Assumptions and Summary Measures for the Last 65 Years of the Long-Range (75-year) Projection Period, Intermediate, Consumer Price Index (CPI-W).

Economic Assumptions

Following is a table with a summary of inflation rate forecasts from the various professional experts at different points in time. It is interesting to note the difference in the inflation forecasts from quarter to quarter since June 2023.

Forward-Looking Price Inflation Forecasts				
	6/30/2023	9/30/2023	12/31/2023	3/31/2024
Congressional Budget Office				
5-Year Annual Average	2.83%	2.83%	2.83%	2.32%
10-Year Annual Average	2.57%	2.57%	2.57%	2.26%
Federal Reserve Bank of Philadelphia				
5-Year Annual Average	2.50%	2.68%	2.60%	2.30%
10-Year Annual Average	2.36%	2.40%	2.40%	2.24%
Federal Reserve Bank of Cleveland				
10-Year Expectation	1.75%	2.22%	2.28%	2.22%
20-Year Expectation	1.96%	2.29%	2.33%	2.31%
30-Year Expectation	2.11%	2.36%	2.39%	2.39%
Federal Reserve Bank of St. Louis				
10-Year Breakeven Inflation	2.20%	2.34%	2.18%	2.31%
20-Year Breakeven Inflation	2.48%	2.58%	2.42%	2.45%
30-Year Breakeven Inflation	2.23%	2.34%	2.19%	2.27%
U.S. Department of the Treasury				
10-Year Breakeven Inflation	2.10%	2.21%	2.09%	2.21%
20-Year Breakeven Inflation	2.40%	2.54%	2.37%	2.43%
30-Year Breakeven Inflation	2.19%	2.27%	2.19%	2.26%
50-Year Breakeven Inflation	2.29%	2.39%	2.29%	2.36%
100-Year Breakeven Inflation	2.37%	2.48%	2.36%	2.44%
Social Security Trustees				
Ultimate Intermediate Assumption	2.40%	2.40%	2.40%	2.40%

Based on this information, our opinion is that it would be reasonable to increase the current price inflation assumption from 2.25% to 2.40%.

Economic Assumptions

Retiree Cost-of-Living Adjustment (COLA) and Increases in the Pay Cap for Pensionable Pay for Participants Hired on and After January 1, 2011

Automatic annual increases in the retirement annuity differ for employees who first become a participant before or on or after January 1, 2011. Employees who first became a participant before January 1, 2011, receive an increase equal to 3% of the current retirement annuity amount. Employees who first become a participant on or after January 1, 2011, receive an increase equal to the lesser of 3% or one-half the annual change in the Consumer Price Index-U, whichever is less, based on the originally granted retirement annuity.

Based on increasing the price inflation assumption to 2.40%, we recommend increasing the retiree COLA assumption from 1.125% to 1.20% for employees who first become a participant on or after January 1, 2011.

For participants who first became members on and after January 1, 2011, and are Tier 2 members, pensionable salary, upon which benefits and member contributions are based, is limited to $106,800 in 2011 and increased by the lesser of 3% and one-half of the annual unadjusted percentage increase in the Consumer Price Index-U (but not less than zero) as measured in the preceding 12-month period ending with the September preceding the November 1, which is the date that the new amount will be calculated and made available to the pension funds.

Based on the recommended price inflation assumption of 2.40%, we recommend increasing the assumption from 1.125% to 1.20% for future increases in the pay cap for pensionable pay.

Economic Assumptions

Investment Return

For purposes of budgeting contributions as a level percentage of payroll, the assumed rate of investment return is used as the discount rate to determine the present value of the system's pension obligations. It is important to note that an actuarial investment return assumption based on expected future experience is a single estimate for all years and therefore implicitly assumes that returns above and below expectations will "average out" over time. In other words, the expected risk premium is reflected in the assumed rate of investment return in advance of being earned, while the investment risk is not reflected until actual experience emerges with each actuarial valuation.

The review of the investment return assumption in this report considers forward-looking measures of likely investment return outcomes for the asset classes in the current and long-term target SURS investment policies. We have compared this analysis with that of the System's Investment Staff and Investment Advisor, Meketa. We thank the System's Staff and Meketa for their cooperation. We have attempted to make our analysis as independent as possible and used our discussions with System Staff as confirmation of our understanding of the Board's investment objectives.

Our analysis is based on the GRS 2024 Capital Market Assumption Modeler (CMAM). The purpose of the CMAM is to assess the reasonability of the assumed rate of return for use in the actuarial valuations for the plan. In our professional judgment, the CMAM has the capability to provide results that are consistent with this purpose. A description of the strengths, limitations and weaknesses of the model are incorporated in this report. In our opinion, the limitations and weaknesses are not material. We performed tests to ensure that the model reasonably represents that which is intended to be modeled. We are relying on the GRS actuaries and Internal Software, Training, and Processes Team who developed and maintain the model.

Because GRS is a benefits consulting firm and does not develop or maintain its own capital market expectations, we request and monitor forward-looking expectations developed by several major financial firms (investment consultants, asset managers and insurance companies). We update our CMAM on an annual basis. The capital market assumptions in the 2024 CMAM are from the following financial firms (in alphabetical order): Aon Hewitt, Blackrock, BNY Mellon, Callan, Cambridge, JPMorgan, Meketa, Mercer, NEPC, Northern Trust, RVK, Verus, and Wilshire. We believe that the benefit of performing this analysis using multiple financial firms is to recognize the uncertain nature of the items affecting the selection of the investment return assumption. While there may be differences in asset classes, investment horizons, inflation assumptions, treatment of investment expenses, excess manager performance (i.e., alpha), etc., we have attempted to align the various assumption sets from the different financial firms to be as consistent as possible. In some cases, we have made minor adjustments or assumptions to align the various assumptions sets with our model.

Twelve of the 13 financial firms provided capital market assumptions over an investment horizon of approximately 10 years. Although financial firms often refer to this period as "short term," it is important to remember that 10 years is actually a very long time. Therefore, returns during the next 10 years will affect the plan's funding materially. Eight of the 13 financial firms provided capital market expectations over a longer horizon, varying between 20 and 30 years.

Each year, the GRS CMAM reflects the most up-to-date information at the time the data was collected (typically reflecting the firms' expectations at the beginning of the calendar year). Generally, the forward-

looking returns in the 2024 survey are slightly lower than the return expectations in the 2023 survey. If we consider the three-year average of return expectations, the general expectations are even lower and the short-term fluctuations are diminished.

To the best of our ability, we have adapted the SURS's investment policy to fit with the financial firms' assumptions adjusting for these known differences in assumptions and methodology. The asset classes in the system's investment allocation often do not exactly align with the asset classes of all financial firms in the survey. This may require us to make approximations which can introduce some subjectivity into the process. In the following charts, to the extent possible, all returns are net of passive investment expenses and have no assumption for excess manager performance (alpha) in excess of active management fees. The information in this report is not intended to be construed as investment advice.

Economic Assumptions

Real Return

The allocation of assets within the universe of investment options will significantly impact the overall performance. Therefore, it is meaningful to identify the range of expected returns based on each fund's targeted allocation of investments and an overall set of capital market assumptions.

For purposes of this analysis, we have reviewed the following investment allocations based on Meketa's Board presentation from February 29, 2024:

Policy Targets (%)		
Classes/Strategies	**Current**	**Long-term**
BROAD GROWTH	**68.0**	**68.0**
Traditional Growth	36.0	35.0
Public Equity	36.0	35.0
Stabilized Growth	17.0	17.0
Core Real Assets	8.0	8.0
Options Strategies	0.0	0.0
Liquid Credit	6.5	4.0
Private Credit	2.5	5.0
Non-Traditional Growth	15.0	16.0
Private Equity	11.0	11.0
Non-Core Real Assets	4.0	5.0
INFLATION SENSITIVE	**5.0**	**5.0**
PRINCIPAL PROTECTION	**10.0**	**10.0**
CRISIS RISK OFFSET	**17.0**	**17.0**
Long U.S. Treasuries	2.0	2.0
Systematic Trend Following	10.0	10.0
Alternative Risk Premia	3.0	3.0
Long Volatility	1.7	1.7
Tail Risk	0.3	0.3
Total	*100.0*	*100.0*
Annual Volatility	**10.5%**	**10.6%**
Expected Geometric Return - 20 Year	**6.7%**	**6.8%**
Expected Geometric Return - 10 Year	**7.8%**	**7.9%**

ASOP No. 27, Section 3.6.2, states that "[d]ue to the uncertain nature of the items for which assumptions are selected, the actuary may consider several different assumptions reasonable for a given measurement. Different actuaries will apply different professional judgment and may choose different reasonable assumptions. As a result, a range of reasonable assumptions may develop, both for an individual actuary and across actuarial practice."

Economic Assumptions

We compared the probabilities of achieving returns over a 10-year horizon. We compute the 40th, 50th, and 60th percentiles of returns as well as the probability of achieving the current assumption of 6.50%, and alternate assumptions of 6.75%, 6.25% and 6.00% over a 10-year horizon. These estimates are based on the assumption that the distribution of returns for the next 10 years is the same each year.

Asset Allocation	Distribution of 10-Year Average Geometric Net Nominal Return			Probability of exceeding 6.50%	Probability of exceeding 6.75%	Probability of exceeding 6.25%	Probability of exceeding 6.00%
	40th	50th	60th				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Current Target	5.9%	6.8%	7.6%	53.3%	50.4%	56.2%	59.0%
Long-term Target	6.0%	6.8%	7.7%	53.9%	51.0%	56.7%	59.6%

The 50th percentile return is also related to the geometric average return. The geometric average of a sequence of returns over a number of years is the compound average of those returns over the number of years compounded. As the number of years in the geometric average increase and if the distributions of returns each year are independent and identically distributed, then the geometric average will converge to the median return. The median return may be considered a reasonable rate of return for purposes of the valuation. The average of 50th percentile returns is about 6.8% under both the current and long-term policy targets.

Following is a summary of the expected returns over 10- and 20-year time horizons for the current and long-term policy targets from Meketa and a summary of the probability of exceeding different rates of return based on the results from the GRS CMAM.

		Meketa		GRS Capital Market Assumption Modeler Probability of Exceeding			
		Geo. Return	Volatility	6.50%	6.75%	6.25%	6%
Current Target	10-year	6.7%		53%	50%	56%	59%
	20-year	7.8%	10.5%	57%	53%	61%	65%
Long-term Target	10-year	6.8%		54%	51%	57%	60%
	20-year	7.9%	10.6%	58%	54%	62%	66%

An important fact to consider when deciding what weight to put on shorter-term results or longer-term results is the amount of benefits that are projected to be paid in the next 10 years. As shown in the following table, about 45% of the present value of future benefits as of June 30, 2023, is attributable to benefits that are projected to be paid in the next 10 years and over 60% of the present value of future benefits as of June 30, 2023, is attributable to benefits that are projected to be paid in the next 15 years. Therefore, it is extremely important to consider shorter-term expectations in addition to longer-term expectations in setting the economic assumptions.

Economic Assumptions

($ In Millions) SURS Values as of June 30, 2023	
(1) Present Value of Future Benefits - PVB (6.50%)	$57,601.35
(2) Market Value of Assets	$23,193.25
(3) Present Value of Benefit Payments in Next 10 Years at 6.50% as % of Total PVB (3)/(1)	$25,932.26 45%
(4) Present Value of Benefit Payments in Next 15 Years at 6.50% as % of Total PVB (4)/(1)	$35,196.40 61%
(5) Present Value of Benefit Payments in Next 20 Years at 6.50% as % of Total PVB (5)/(1)	$42,039.88 73%
(6) Present Value of Benefit Payments in Next 30 Years at 6.50% as % of Total PVB (6)/(1)	$50,213.12 87%

Recommendation

Based on our analysis of the expected investment return, the 10-year and 20-year return expectations from Meketa, our recommended assumption for inflation of 2.40% and the SURS current and long-term policy target allocations, we recommend maintaining the investment return assumption of 6.50 percent for the actuarial valuation as of June 30, 2024.

We will monitor the assumed investment return assumption for continued appropriateness between full experience reviews. Also, any significant changes in the target asset allocation of the System may warrant an additional review of the rate of return assumption.

We believe that the recommended assumption can be supported by Actuarial Standard of Practice No. 27. Under the Standard, all economic assumptions must be selected to be consistent with the purpose of the measurement. The purpose of the measurement is to determine the contribution rate which will lead to the accumulation of assets to pay benefits when due.

Additional Considerations

The prescribed interest rate used to develop the money purchase conversion factors is equal to the investment return assumption used in the annual actuarial valuation. The money purchase conversion factors, which apply to Rule 2 benefit calculations (for members hired before July 1, 2005), by statute, are to be updated each time there is a change in the investment return assumption or the post retirement mortality assumption. Therefore, the money purchase factors would need to be updated in the near future based on our recommendation to modify the mortality assumption.

Economic Assumptions

Following is a table summarizing the recent changes in assumptions and the effective date of the money purchase factors:

Valuation Date	Updated Investment Return Assumption	Effective Date of Updated Money Purchase Factors
June 30, 2014 (investment return)/June 30, 2015 (mortality)	7.25%	January 4, 2016
June 30, 2018	6.75%	July 2, 2019
June 30, 2021	6.50%	July 2, 2022

Illustrations of the impact on money purchase benefits of changing the money purchase conversion factors can be found later in this report under "Other Valuation Assumptions."

Economic Assumptions

Effective Rate of Interest (ERI)

The assumed effective rate of interest impacts the projected benefits calculated in the actuarial valuation for members who were hired before July 1, 2005, and are eligible for benefits calculated under the highest of three formulas – the general formula, the money purchase formula and the minimum benefit formula. The assumed effective rate of interest also impacts the projected member contributions under the Portable Plan for purposes of refunds and lump sum retirements.

In order to value all future liabilities in the plan during the annual actuarial valuation, the actuary makes an assumption about the future effective rate of interest to be used in crediting the money purchase accounts and for Portable Plan lump sum retirements and refunds.

The actual Rule 2 Money Purchase ERI, or Effective Rate of Interest, is set by the Comptroller's office each year. Beginning with the Money Purchase ERI for fiscal year 2006, the State Comptroller determined the rate for purposes of crediting member contributions balances for the Rule 2 money purchase formula. The SURS Board of Trustees determined the ERI for years prior to fiscal year 2006 for all purposes, including money purchase, and continues to certify the ERI for purposes of calculating service purchases, refunds for excess contributions and for lump sum retirements and refunds under the Portable Plan.

The following table shows the ERI assumptions used in the actuarial valuation, the ERI assumption approved by the SURS Board and the actual ERI declared by the Comptroller's office for the last 15 years:

Fiscal Years Ending June 30,	Assumed overall Rate of Return - Valuation	ERI assumption used in the actuarial valuation	ERI "Legacy" approved by the SURS Board of Trustees*	ERI declared by the Comptroller's Office
2025			7.00%	7.50%
2024	*6.50%*	*7.00%*	6.50%	7.00%
2023	6.50%	6.50%	6.25%	6.25%
2022	6.50%	6.50%	5.50%	5.50%
2021	6.50%	6.50%	6.00%	6.00%
2020	6.75%	6.75%	6.50%	6.50%
2019	6.75%	6.75%	6.50%	6.75%
2018	6.75%	6.75%	6.50%	6.50%
2017	7.25%	7.00%	7.00%	6.75%
2016	7.25%	7.00%	7.00%	7.00%
2015	7.25%	7.00%	7.00%	6.75%
2014	7.25%	7.00%	7.00%	6.75%
2013	7.75%	7.00%	7.50%	6.50%
2012	7.75%	7.75%	7.50%	6.75%
2011	7.75%	7.75%	7.50%	7.00%

* For purposes of calculating service purchases, refunds for excess contributions and for lump sum retirements and refunds under the Portable Plan.

Recommended assumptions for the actuarial valuation as of June 30, 2024 are bolded and italicized.

Economic Assumptions

The methodology for the calculation of the ERI differs from the methodology used to review the investment return assumption in the following ways:

- The calculation of the ERI by the Comptroller uses a 20-year time horizon for expected future returns, whereas GRS focuses more on the 10-year expected returns for purposes of reviewing the investment return assumption.

- The calculation of the ERI by the Comptroller includes an adjustment for past SURS investment experience compared to past ERIs. These adjustments were 0.83% and 1.07% for the fiscal year 2024 and 2025 ERI. Favorable past SURS investment experience does not affect the investment return assumption used in the actuarial valuation (it is already reflected in the asset values used in the actuarial valuation).

The calculated Comptroller ERI for fiscal year 2024 and 2025 were 8.00% and 8.24%, respectively, but were certified at 7.00% and 7.50%, respectively, to reflect "the desirability of minimizing year over year fluctuations in ERI while reflecting fundamental changes in return experience and capital market expectations".

We are recommending an increase to the assumed ERI for valuation purposes from 6.50% to 7.00% for the purpose of estimating future benefits and liabilities in the actuarial valuation for the Rule 2 money purchase conversions and for Portable Plan lump sum refunds and retirement conversions. The ERI each year that will be used to actually credit member accounts will continue to be calculated by the Office of the Comptroller and by SURS.

As an actuarial assumption change, this will only affect the actuarial valuation and the liability and funding results. This will not impact the actual benefits earned by the members. This change in actuarial assumption will increase the liabilities of the plan, since the assumption of a higher long-term rate of interest in the money purchase account will produce a higher assumed money purchase balance and therefore a higher future retirement benefit. A change in the assumed ERI credited to member accounts does not affect the factors used to convert the money purchase account balance to an annuity. (These factors are impacted by the assumed long-term rate of investment return and the mortality assumption.)

General Wage Inflation

A General Wage Inflation (GWI) assumption represents the real wage growth over time in the general economy, (i.e., how much the pay scales themselves will change year to year). It does not necessarily reflect actual pay increases received by individuals or even how payroll in total may change, which can be impacted by population changes, etc. Wage inflation consists of two components, (1) a portion due to pure price inflation (i.e., increases due to changes in the CPI), and (2) increases in average salary levels in excess of pure price inflation (i.e., increases due to changes in productivity levels, supply and demand in the labor market and other macroeconomic factors).

The Average Wage Index (AWI), formerly named the National Average Earnings (NAE), series published in connection with the operation of the Social Security program, is a useful proxy for measuring general changes in wage levels in the economy. Increases in AWI typically exceed increases in the Consumer Price Index (CPI), although there are periods where the patterns are reversed. The economic argument for wages exceeding prices in the long run is that CPI is based on the prices of a fixed basket of goods whereas wages reflect innovations, real productivity growth, labor supply and demand and other factors in addition to pure price inflation.

History of CPI and AWI 1955 - 2022
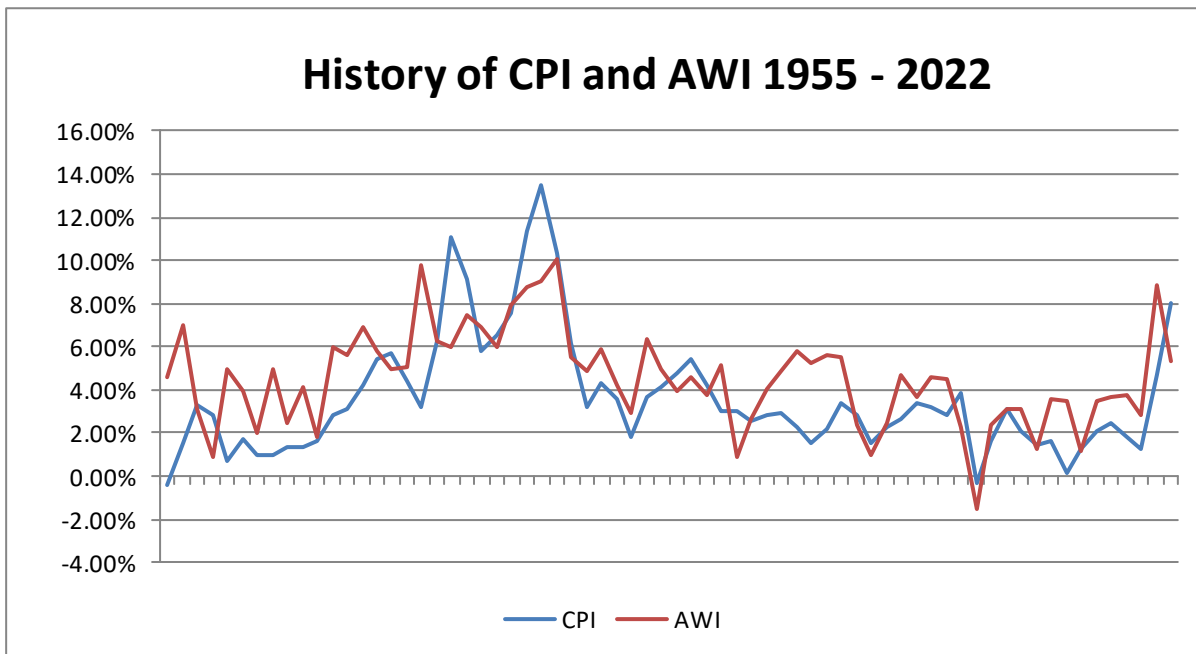
Over the last 65 years, AWI has exceeded CPI 44 times and the averages over that period are 4.5% for AWI and 3.5% for CPI. The last 25 years has had fewer cases of high inflation, but the distinction between prices and wages still appears. Over the last 25 years, the average increase in AWI is 3.4% and the average increase in CPI is 2.2%.

As with the investment return assumption, past experience does not necessarily dictate future expectations. For a long-term view, the 2023 Annual Report from the Trustees of the Social Security Administration (SSA) assumes an intermediate average ultimate CPI of 2.4% over the next 75 years and an ultimate intermediate growth assumption for average wages in covered employment of 3.5%. The SSA

Economic Assumptions

report provides alternate "High-cost" assumptions of 1.8% CPI/2.3% wages and "Low-cost" assumptions of 3.0% CPI/4.8% wages.

We recommend maintaining the assumption for productivity increases at 0.75%. The 0.75% assumption is more consistent with the average salary increases (in excess of price inflation) that were received by SURS members with 35 or more years of service during the experience study period. Combining the recommendation of 0.75% for productivity increases with a 2.40% inflation assumption implies a wage growth assumption of 3.15%. These assumptions are summarized below:

	Current Assumption	Recommended Assumption
Price Inflation	2.25%	2.40%
Productivity Increases	0.75%	0.75%
Total Wage Inflation	3.00%	3.15%

Economic Assumptions

Salary Increase

The components that determine the total salary increase are wage inflation, merit and longevity increases and promotion increases. We have recommended an increase to the wage inflation component to reflect an increase in the price inflation assumption.

Following is a summary of the average salary increases for each of the three years of the experience study separately for Academic and Non-Academic employees. For the year ending June 30, inflation was 0.65% for 2020, 5.39% for 2021 and 9.06% for 2022. We expect that the higher than expected increases in 2023 were influenced by the higher rates of inflation.

Years of Service	Academic				Non-Academic				
	Year Ending 6/30/2021	Year Ending 6/30/2022	Year Ending 6/30/2023	3-Year Average	Year Ending 6/30/2021	Year Ending 6/30/2022	Year Ending 6/30/2023	3-Year Average	Difference 3-Year Average
1-10	6.80%	6.79%	9.81%	7.77%	6.51%	7.78%	10.34%	8.23%	0.45%
11-20	3.06%	3.74%	6.06%	4.25%	3.21%	4.77%	6.70%	4.91%	0.66%
21-30	2.12%	2.96%	5.40%	3.52%	2.38%	4.04%	5.73%	4.09%	0.56%
31+	2.11%	2.59%	4.16%	3.01%	2.45%	3.42%	5.09%	3.63%	0.62%
Total	3.87%	4.35%	6.81%	5.00%	4.67%	6.06%	8.26%	6.35%	1.35%
Total Expected	4.36%	4.27%	4.20%	4.28%	5.46%	5.32%	5.37%	5.38%	1.11%
Difference from Expected	-0.49%	0.07%	2.60%	0.72%	-0.78%	0.74%	2.90%	0.97%	0.25%

Following is a summary of the average actual salary increases during the first two years of service from the current experience study and the last four experience studies. We believe that the high increases are related to the salary data that is provided for newer members (and that pay for a partial year one year is compared to pay for a full year the following year). We recommend that the average increase rate over the first two years be used as the salary increase assumption for those years to account for both salary increases and how the salary data is reported. Short service members have a low liability, and therefore, any gains or losses related to salary experience for these members will minimally affected the valuation results.

Years of Service	Average Total Salary Increase					
	2010	2014	2018	2021	2024 – Academic	2024 – Non-Academic
1	77%	21%	5%	2%	10%	6%
2	33%	21%	17%	16%	25%	18%
Average Rate	53%	21%	11%	13%	17%	12%

The experience in Tables I(a) and I(b) and Graphs I(a) through I(c) shows that actual salary increases differ between employees older and younger than age 50 (with the same amount of service) and differ between Academic and Non-Academic employees. We recommend separate salary increase rates for Academic

and Non-Academic employees in addition to maintaining separate rates for employees younger and older than age 50.

Table and Graph I compare the salary experience, current assumptions and recommended assumptions by years of service for each of the following:

- Table I(a) – Salary Experience by Service – Academic
- Table I(b) – Salary Experience by Service – Non-Academic
- Graph I(a) – Salary Experience by Service (3+ Years) – Academic
- Graph I(b) – Salary Experience by Service (3+ Years) – Non-Academic
- Graph I(c) – Salary Experience by Service (3+ Years) – Comparison of Academic and Non-Academic

The following table compares the rates of increase for an active member's remaining career assuming the member was hired at age 35 (and therefore the rates applicable to ages 50 and older begin at 15 years of service.

The proposed rates assume a higher average annual rate of increase of between 0.05% and 0.26% for Academic compared to the current rates depending on length of career and service at the valuation) and a higher average annual rate of increase of between 0.19% and 0.35% for Non-Academic.

| | | Average Annual Salary Increases | | | | | |
| | | Academic | | | Non-Academic | | |
Service At Valuation	Service at End of Career	Actual Increase	Current Assumption	Proposed Assumption	Actual Increase	Current Assumption	Proposed Assumption
0	20	6.42%	5.82%	6.08%	6.35%	5.82%	6.01%
0	25	5.82%	5.30%	5.50%	5.86%	5.30%	5.50%
0	30	5.40%	4.95%	5.13%	5.51%	4.95%	5.17%
0	35	5.05%	4.70%	4.85%	5.26%	4.70%	4.92%
10	20	4.27%	4.02%	4.12%	4.85%	4.02%	4.37%
10	25	3.99%	3.76%	3.83%	4.54%	3.76%	4.08%
10	30	3.82%	3.64%	3.69%	4.35%	3.64%	3.94%
10	35	3.65%	3.55%	3.59%	4.23%	3.55%	3.83%

Salary Scale Assumption

Table I(a)

	Academic - Under Age 50 Actual						Academic - Age 50 and Older Actual					
Service at End of Year	Number	Prior Year	Current Year	Total Increase	Expected Total Increase	Proposed Total Increase	Number	Prior Year	Current Year	Total Increase	Expected Total Increase	Proposed Total Increase
1	193	$ 8,266,110	$ 9,195,248	11.24%	12.75%	15.00%	50	$ 2,736,746	$ 2,880,830	5.26%	12.00%	13.00%
2	1,313	65,343,148	81,788,861	25.17%	12.75%	15.00%	284	14,836,032	18,043,088	21.62%	12.00%	13.00%
3	1,579	97,063,780	106,367,085	9.58%	9.00%	9.00%	392	20,679,535	22,968,286	11.07%	8.25%	9.25%
4	2,111	109,147,259	116,563,927	6.80%	7.75%	7.75%	797	30,119,534	32,583,871	8.18%	7.00%	7.50%
5	1,972	99,772,242	106,735,504	6.98%	6.75%	6.75%	925	33,790,112	36,720,371	8.67%	6.00%	6.75%
6	1,741	91,137,527	97,099,067	6.54%	6.25%	6.25%	922	35,701,300	38,334,796	7.38%	5.50%	6.25%
7	1,583	89,646,922	94,477,265	5.39%	6.00%	6.00%	928	36,569,422	38,788,943	6.07%	5.25%	5.75%
8	1,522	88,273,727	93,312,136	5.71%	5.50%	5.50%	914	38,940,493	41,136,104	5.64%	4.75%	5.25%
9	1,430	89,127,303	93,606,393	5.03%	5.00%	5.00%	927	43,247,747	45,233,034	4.59%	4.25%	4.25%
10	1,354	89,590,306	94,312,519	5.27%	5.00%	5.00%	874	44,602,171	46,184,551	3.55%	4.25%	4.25%
11	1,227	89,555,750	93,561,135	4.47%	5.00%	5.00%	899	50,634,368	52,551,195	3.79%	4.25%	4.25%
12	1,156	86,815,633	90,919,276	4.73%	4.50%	4.75%	888	53,546,332	55,578,983	3.80%	3.75%	3.75%
13	1,047	84,027,596	88,253,136	5.03%	4.50%	4.75%	934	62,255,917	64,284,121	3.26%	3.75%	3.75%
14	976	82,064,333	86,471,012	5.37%	4.50%	4.75%	1,011	70,748,258	73,732,983	4.22%	3.75%	3.75%
15	864	75,935,916	79,495,156	4.69%	4.50%	4.75%	1,118	82,530,748	85,822,808	3.99%	3.75%	3.75%
16	783	69,086,467	72,443,537	4.86%	4.25%	4.50%	1,147	88,091,259	91,328,179	3.67%	3.50%	3.50%
17	669	60,560,534	63,640,948	5.09%	4.25%	4.50%	1,185	95,812,415	99,569,031	3.92%	3.50%	3.50%
18	590	54,351,241	56,699,842	4.32%	4.25%	4.50%	1,171	97,237,858	100,727,897	3.59%	3.50%	3.50%
19	515	48,286,650	50,709,727	5.02%	4.25%	4.50%	1,182	106,624,876	110,295,890	3.44%	3.50%	3.50%
20	445	41,542,765	43,701,847	5.20%	4.00%	4.50%	1,184	112,193,127	116,420,051	3.77%	3.25%	3.25%
21	337	31,963,639	33,661,569	5.31%	3.75%	4.25%	1,134	110,750,051	114,737,315	3.60%	3.25%	3.25%
22	278	25,945,795	27,141,473	4.61%	3.75%	4.25%	1,059	98,608,227	101,763,106	3.20%	3.25%	3.25%
23	174	15,632,645	16,367,722	4.70%	3.75%	4.25%	952	93,538,515	96,541,459	3.21%	3.25%	3.25%
24	137	12,004,657	12,534,292	4.41%	3.75%	4.25%	874	88,403,272	91,618,606	3.64%	3.25%	3.25%
25	82	7,327,780	7,688,171	4.92%	3.75%	4.25%	781	82,164,667	85,119,347	3.60%	3.25%	3.25%
26	55	5,213,743	5,336,207	2.35%	3.75%	4.00%	760	82,319,110	85,267,605	3.58%	3.25%	3.25%
27	27	2,741,388	2,878,079	4.99%	3.75%	4.00%	739	83,201,674	86,211,446	3.62%	3.25%	3.25%
28	12	1,356,204	1,392,395	2.67%	3.75%	4.00%	698	81,940,064	84,668,471	3.33%	3.25%	3.25%
29	7	806,516	818,143	1.44%	3.75%	4.00%	623	72,994,535	75,133,919	2.93%	3.25%	3.25%
30	0	-	-	N\A	3.75%	4.00%	605	71,522,461	73,672,710	3.01%	3.25%	3.25%
31	0	-	-	N\A	3.75%	3.75%	468	61,600,231	63,541,622	3.15%	3.25%	3.25%
32	0	-	-	N\A	3.75%	3.75%	377	51,784,730	53,662,183	3.63%	3.25%	3.25%
33	0	-	-	N\A	3.75%	3.75%	240	38,349,332	39,470,779	2.92%	3.25%	3.25%
34	0	-	-	N\A	3.75%	3.75%	163	25,502,968	26,148,730	2.53%	3.25%	3.25%
35+	0	-	-	N\A	3.50%	3.50%	643	105,138,462	108,052,121	2.77%	3.00%	3.15%
Total	**24,179**	**$1,622,587,576**	**$1,727,171,672**	**6.45%**	**5.72%**	**5.95%**	**27,848**	**$2,268,716,549**	**$2,358,794,431**	**3.97%**	**3.70%**	**3.77%**
Total Years 1-5	**7,168**	**379,592,539**	**420,650,625**	**10.82%**	**8.78%**	**9.21%**	**2,448**	**102,161,959**	**113,196,446**	**10.80%**	**7.78%**	**8.55%**
Total Years 6-10	**7,630**	**447,775,785**	**472,807,380**	**5.59%**	**5.55%**	**5.55%**	**4,565**	**199,061,133**	**209,677,428**	**5.33%**	**4.76%**	**5.08%**
Total Years 11-15	**5,270**	**418,399,228**	**438,699,715**	**4.85%**	**4.61%**	**4.80%**	**4,850**	**319,715,623**	**331,970,090**	**3.83%**	**3.83%**	**3.83%**
Total Years 16-20	**3,002**	**273,827,657**	**287,195,901**	**4.88%**	**4.21%**	**4.50%**	**5,869**	**499,959,535**	**518,341,048**	**3.68%**	**3.44%**	**3.44%**
Total Years 21+	**1,109**	**102,992,367**	**107,818,051**	**4.69%**	**3.75%**	**4.23%**	**10,116**	**1,147,818,299**	**1,185,609,419**	**3.29%**	**3.23%**	**3.24%**

Salary Scale Assumption

Graph I(a)
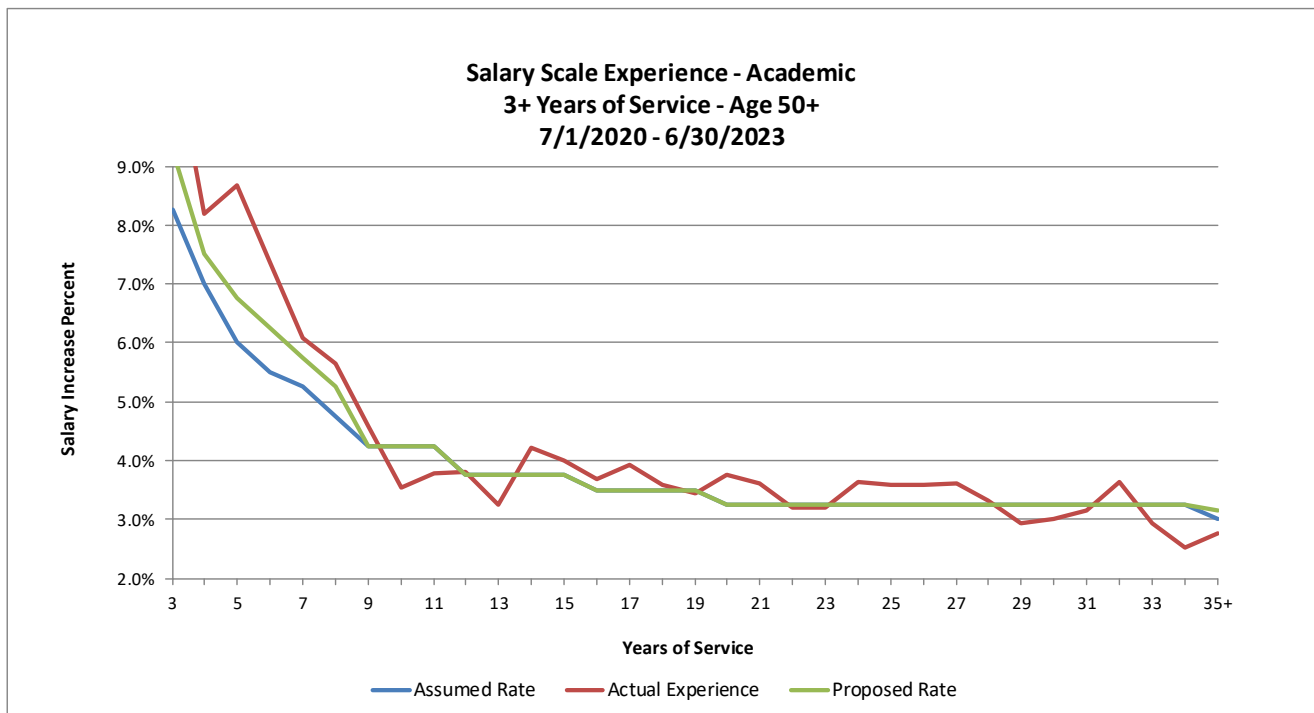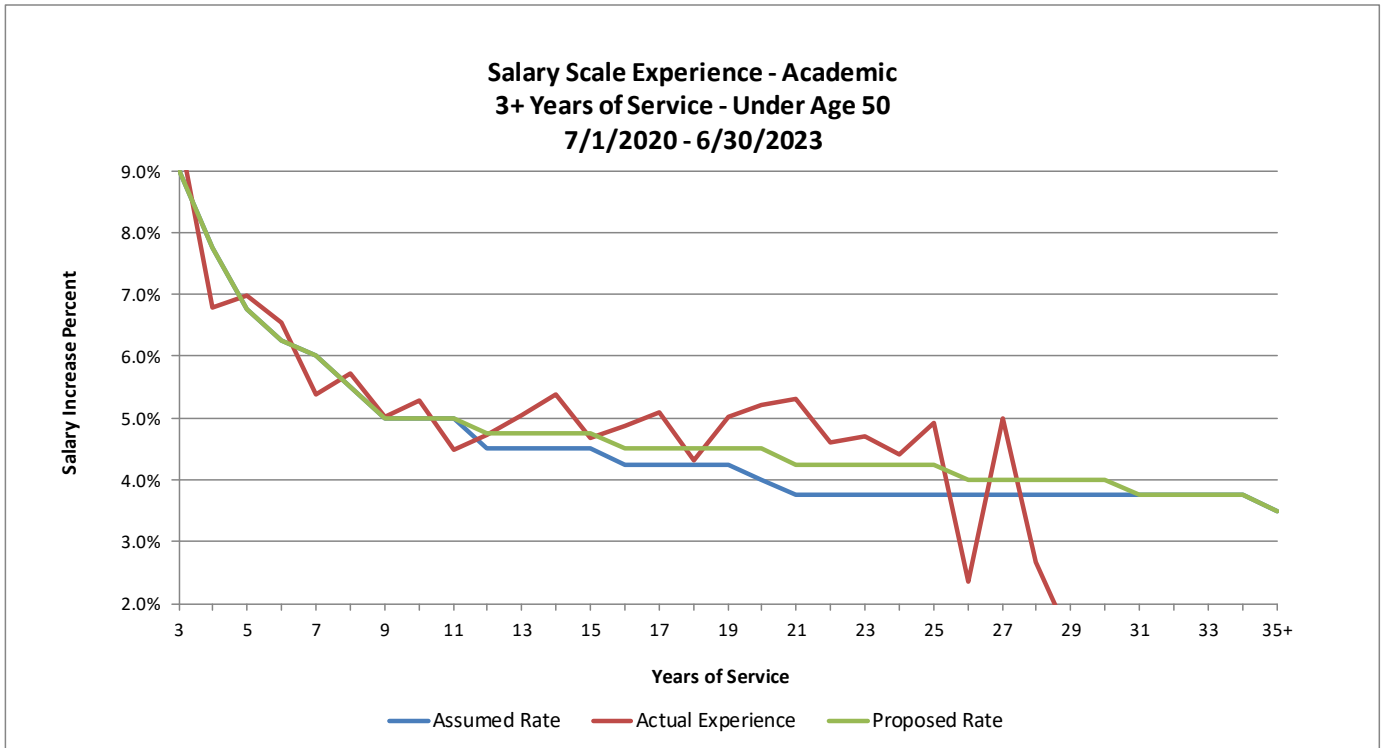
Salary Scale Experience - Academic
3+ Years of Service - Under Age 50
7/1/2020 - 6/30/2023

Salary Scale Experience - Academic
3+ Years of Service - Age 50+
7/1/2020 - 6/30/2023

Actual price inflation was about 5.00% from July 1, 2019, through June 30, 2022 and 5.80% from July 1, 2020, through June 30, 2023 compared to the assumed inflation of 2.25% during the experience study period.
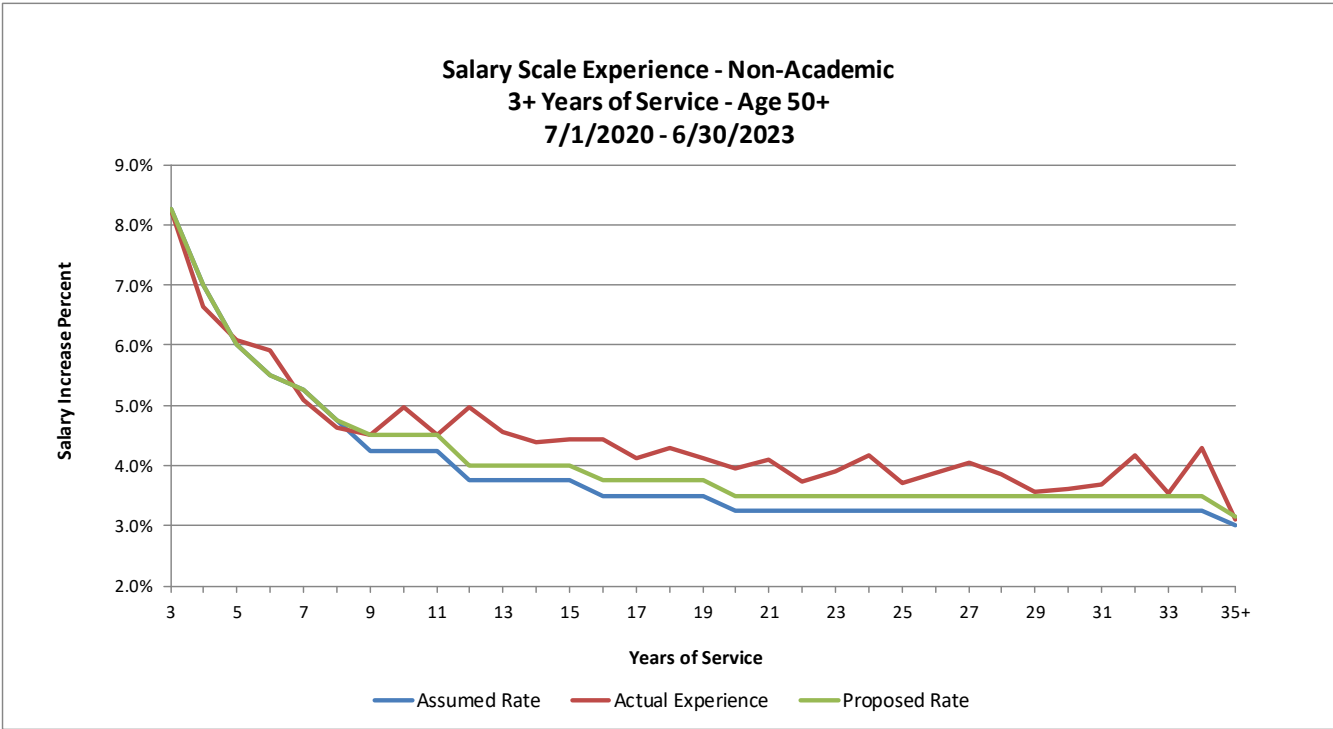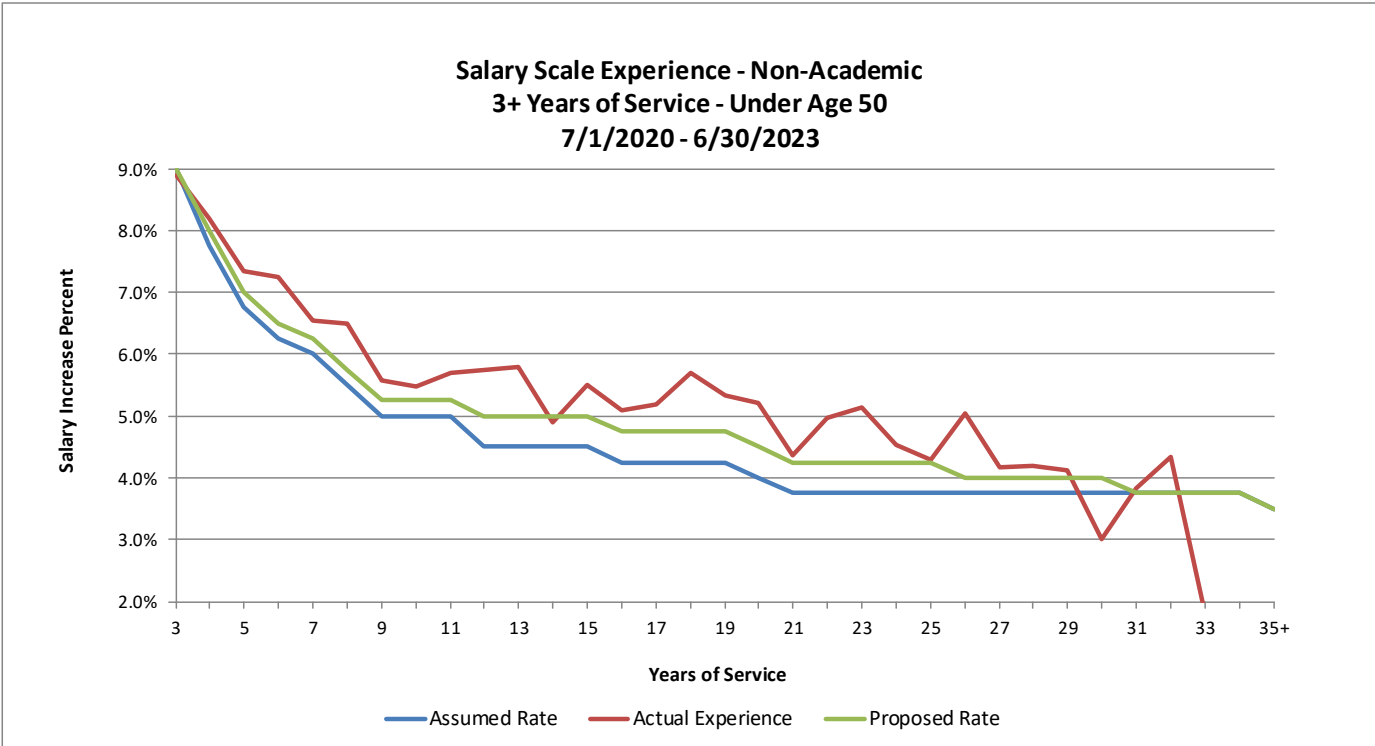
Salary Scale Assumption

Table I(b)

Service at End of Year	Non-Academic - Under Age 50 Actual						Non-Academic - Age 50 and Older Actual					
	Number	Prior Year	Current Year	Total Increase	Expected Total Increase	Proposed Total Increase	Number	Prior Year	Current Year	Total Increase	Expected Total Increase	Proposed Total Increase
1	2,237	$ 110,228,098	$ 116,517,322	5.71%	12.75%	12.00%	352	$ 18,528,038	$ 19,902,811	7.42%	12.00%	11.00%
2	6,849	303,025,969	356,691,621	17.71%	12.75%	12.00%	1,361	61,638,919	73,428,639	19.13%	12.00%	11.00%
3	6,831	344,935,004	375,596,289	8.89%	9.00%	9.00%	1,522	76,387,819	82,674,664	8.23%	8.25%	8.25%
4	5,935	305,837,877	330,900,854	8.19%	7.75%	8.00%	1,661	83,514,399	89,057,840	6.64%	7.00%	7.00%
5	4,554	242,474,736	260,280,820	7.34%	6.75%	7.00%	1,613	82,882,580	87,923,738	6.08%	6.00%	6.00%
6	3,546	191,613,241	205,478,623	7.24%	6.25%	6.50%	1,391	71,502,848	75,721,457	5.90%	5.50%	5.50%
7	3,153	177,840,160	189,483,387	6.55%	6.00%	6.25%	1,402	72,623,862	76,317,184	5.09%	5.25%	5.25%
8	2,870	165,166,080	175,900,087	6.50%	5.50%	5.75%	1,484	78,570,617	82,205,427	4.63%	4.75%	4.75%
9	2,768	166,028,370	175,297,317	5.58%	5.00%	5.25%	1,623	88,534,634	92,515,173	4.50%	4.25%	4.50%
10	2,479	151,106,001	159,369,248	5.47%	5.00%	5.25%	1,706	94,941,310	99,646,468	4.96%	4.25%	4.50%
11	2,179	139,390,179	147,326,424	5.69%	5.00%	5.25%	1,531	90,578,846	94,659,600	4.51%	4.25%	4.50%
12	1,665	111,002,902	117,366,122	5.73%	4.50%	5.00%	1,280	78,332,376	82,213,937	4.96%	3.75%	4.00%
13	1,538	103,871,620	109,887,427	5.79%	4.50%	5.00%	1,227	76,020,298	79,474,572	4.54%	3.75%	4.00%
14	1,611	109,268,593	114,608,389	4.89%	4.50%	5.00%	1,425	89,489,246	93,422,673	4.40%	3.75%	4.00%
15	1,689	115,508,621	121,859,715	5.50%	4.50%	5.00%	1,534	100,770,516	105,233,802	4.43%	3.75%	4.00%
16	1,557	109,352,718	114,910,638	5.08%	4.25%	4.75%	1,601	107,134,141	111,875,115	4.43%	3.50%	3.75%
17	1,281	89,829,177	94,494,182	5.19%	4.25%	4.75%	1,489	99,797,305	103,901,311	4.11%	3.50%	3.75%
18	1,024	73,296,607	77,478,131	5.70%	4.25%	4.75%	1,384	95,026,587	99,098,663	4.29%	3.50%	3.75%
19	870	62,901,650	66,249,760	5.32%	4.25%	4.75%	1,244	85,705,069	89,234,936	4.12%	3.50%	3.75%
20	843	61,071,507	64,249,712	5.20%	4.00%	4.50%	1,308	91,590,676	95,203,885	3.95%	3.25%	3.50%
21	877	63,478,052	66,239,178	4.35%	3.75%	4.25%	1,362	96,167,133	100,102,211	4.09%	3.25%	3.50%
22	758	54,894,664	57,624,586	4.97%	3.75%	4.25%	1,337	91,927,076	95,368,255	3.74%	3.25%	3.50%
23	602	42,793,054	44,986,368	5.13%	3.75%	4.25%	1,227	84,936,998	88,253,362	3.90%	3.25%	3.50%
24	424	30,700,541	32,091,005	4.53%	3.75%	4.25%	1,118	77,320,967	80,542,209	4.17%	3.25%	3.50%
25	311	22,320,904	23,277,822	4.29%	3.75%	4.25%	982	68,300,467	70,827,456	3.70%	3.25%	3.50%
26	248	18,753,518	19,699,095	5.04%	3.75%	4.00%	882	63,148,705	65,599,883	3.88%	3.25%	3.50%
27	194	14,372,894	14,972,366	4.17%	3.75%	4.00%	871	65,415,148	68,054,666	4.04%	3.25%	3.50%
28	123	9,376,982	9,768,985	4.18%	3.75%	4.00%	808	63,416,454	65,862,162	3.86%	3.25%	3.50%
29	72	5,088,969	5,298,557	4.12%	3.75%	4.00%	694	53,908,210	55,825,233	3.56%	3.25%	3.50%
30	34	2,269,960	2,338,308	3.01%	3.75%	4.00%	579	43,390,746	44,961,139	3.62%	3.25%	3.50%
31	12	821,800	853,298	3.83%	3.75%	3.75%	515	38,790,123	40,222,994	3.69%	3.25%	3.50%
32	4	278,858	290,932	4.33%	3.75%	3.75%	419	33,338,715	34,727,554	4.17%	3.25%	3.50%
33	1	59,259	60,320	1.79%	3.75%	3.75%	324	27,067,820	28,026,358	3.54%	3.25%	3.50%
34	0	-	-	N\A	3.75%	3.75%	218	17,821,457	18,587,405	4.30%	3.25%	3.50%
35+	0	-	-	N\A	3.50%	3.50%	630	56,103,487	57,837,632	3.09%	3.00%	3.15%
Total	59,139	$3,398,958,565	$3,651,446,888	7.43%	6.61%	6.79%	40,104	$2,524,623,592	$2,648,510,414	4.91%	4.27%	4.43%
Total Years 1-5	26,406	1,306,501,684	1,439,986,906	10.22%	9.48%	9.34%	6,509	322,951,755	352,987,692	9.30%	8.28%	8.03%
Total Years 6-10	14,816	851,753,852	905,528,662	6.31%	5.59%	5.84%	7,606	406,173,271	426,405,709	4.98%	4.75%	4.86%
Total Years 11-15	8,682	579,041,915	611,048,077	5.53%	4.62%	5.06%	6,997	435,191,282	455,004,584	4.55%	3.85%	4.10%
Total Years 16-20	5,575	396,451,659	417,382,423	5.28%	4.21%	4.71%	7,026	479,253,778	499,313,910	4.19%	3.45%	3.70%
Total Years 21+	3,660	265,209,455	277,500,820	4.63%	3.75%	4.20%	11,966	881,053,506	914,798,519	3.83%	3.23%	3.48%

Salary Scale Assumption

Graph I(b)

**Salary Scale Experience - Non-Academic
3+ Years of Service - Under Age 50
7/1/2020 - 6/30/2023**

**Salary Scale Experience - Non-Academic
3+ Years of Service - Age 50+
7/1/2020 - 6/30/2023**

Actual price inflation was about 5.00% from July 1, 2019, through June 30, 2022 and 5.80% from July 1, 2020, through June 30, 2023 compared to the assumed inflation of 2.25% during the experience study period.

Salary Scale Assumption

Graph I(c)

Actual Salary Scale Experience - Academic
3+ Years of Service - Shown Separately for Under Age 50 and Age 50+
7/1/2020 - 6/30/2023

Actual Salary Scale Experience - Non-Academic
3+ Years of Service - Shown Separately for Under Age 50 and Age 50+
7/1/2020 - 6/30/2023

Salary Scale Assumption

Graph I(d)

Actual Salary Scale Experience for Under Age 50
3+ Years of Service - Shown Separately for Academic and Non-Academic
7/1/2020 - 6/30/2023

Actual Salary Scale Experience for Age 50+
3+ Years of Service - Shown Separately for Academic and Non-Academic
7/1/2020 - 6/30/2023

Demographic Assumptions

The following pages present the analysis of the demographic assumptions. These assumptions include assumed rates of mortality among active and retired members, retirement patterns, disability incidence and turnover patterns. These patterns generally take the form of tables of rates of incidence based on age and/or years of service.

Absent any significant changes in benefit provisions, these assumptions generally exhibit relative consistency over periods of time. As a result, each demographic assumption is normally reviewed by relating actual experience to that assumed over the recent past.

Actuarial Standard of Practice No. 35 – Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

ASOP No. 35 applies to actuaries when they are selecting demographic and all other assumptions not covered by ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, to measure obligations under any defined benefit pension plan that is not a social insurance program as described in section 1.2, Scope, of ASOP No. 32, Social Insurance.

The actuary should identify the types of demographic assumptions to use for a specific measurement. In doing so, the actuary should determine the following:

    (a) The purpose and nature of the measurement;
    (b) The plan provisions or benefits and factors that will affect the timing and value of any potential benefit payments;
    (c) The characteristics of the obligation to be measured (such as measurement period, pattern of plan payments over time, open or closed group, and volatility);
    (d) The contingencies that give rise to benefits or result in loss of benefits;
    (e) The significance of each assumption; and
    (f) The characteristics of the covered group.

Not every contingency requires a separate assumption. For example, for a plan that is expected to provide benefits of equal value to employees who voluntarily terminate employment or become disabled, retire, or die, the actuary may use an assumption that reflects some or all of the above contingencies in combination rather than selecting a separate assumption for each.

Analysis Approach

The analysis of demographic experience is conducted for each assumption using a measure known as the "Actual to Expected (A/E) Ratio." The A/E Ratio is simply the ratio of the actual number of occurrences of the event to which the assumption applies (e.g., deaths or retirements) to the number expected to occur in accordance with the assumption. An A/E Ratio of 1.00 indicates that the assumption precisely predicted the number of occurrences. An A/E Ratio exceeding 1.00 indicates that the assumption underestimated actual experience. Conversely, an A/E Ratio lower than 1.00 indicates that the assumption overestimated actual experience.

These are statistical analyses. As a result, there are several considerations we must keep in mind as we analyze these ratios:

Demographic Assumptions

(1) An actuarial assumption is designed to reflect average experience over long periods of time (30 - 50 years). As a result:

    (a) A deviation between actual experience and that expected from our assumptions for one or two years does not necessarily mean that the assumption should be changed.

    b) A change in actuarial assumption should result if the experience indicates a consistent pattern which is different from that assumed over a period of years.

(2) The larger the amount of data available, the more reliable the statistics used in the analysis. As a result:

    (a) Events that occur with great frequency (e.g., general employment turnover) are more credibly predictable than those occurring less frequently (e.g., active member death).

    (b) In all cases, data covering the entire study period produce more credible results than data for a single year.

    (c) Year by year experience is helpful only in identifying trends and determining whether the three-year data is truly reflective of the entire period.

This analysis is based on the actuarial valuation data for the three-year period from June 30, 2020, to June 30, 2023. (Additional years were used for analyzing the mortality assumptions.)

In addition to analyzing experience based on headcounts, we also analyzed experience on a liability-weighted basis. Analyzing experience on a liability-weighted basis gives additional credibility to decrements that occur to members with a higher liability (due to higher pays, more service or younger ages). The liability amounts shown in the experience tables are total liability amounts divided by $100,000.

We reviewed experience separately based on employment classifications (Academic and Non-Academic). Following is a summary of the membership as of June 30, 2023 based on these classifications.

	Full-Time Active Member Counts			FY 2023 Payroll ($ in Millions)		
	SURS	RSP	Total	SURS	RSP	Total
Academic	19,078	5,345	24,423	$1,417	$616	$2,033
Non-Academic	39,294	7,404	46,698	2,349	602	2,951
Total	58,372	12,749	71,121	3,766	1,218	4,984

	Retiree and Beneficiary Counts	FY 2023 Annualized Benefits ($ in Millions)
	SURS	SURS
Academic	32,300	$1,577
Non-Academic	40,280	1,400
Total	72,580	2,977

Retirement Assumption

Retirement

The Plan provisions establish the minimum eligibility requirements for retirement. Participants of the plan who became members before January 1, 2011, are in Tier 1 and participants of the plan who became members on or after January 1, 2011, are in Tier 2. Following is a summary of the retirement eligibility conditions for normal (unreduced) retirement and early (reduced) retirement for each Tier and member type (police officers and all others). The retirement eligibility conditions are based on age and years of service.

Police Officers		All Others	
Normal (Unreduced) Retirement		**Normal (Unreduced) Retirement**	
Tier 1	**Tier 2**	**Tier 1**	**Tier 2**
Age 55/20 Years	Age 60/20 Years	Age 62/5 Years	Age 67/10 Years
Age 50/25 Years	Age 67/10 Years	Age 60/8 Years	
		Any age/30 Years	
Early (Reduced) Retirement		**Early (Reduced) Retirement**	
Tier 1	**Tier 2**	**Tier 1**	**Tier 2**
	Age 62/10 Years	Age 55/8 Years	Age 62/10 Years

Retirement cost, however, is determined not by the minimum eligibility requirements but by the ages at which members actually retire. The actuarial valuation does not assume that everyone retires at earliest eligibility. The assumption about the timing of retirement once eligibility has been established is a major component in cost calculations. Note that higher rates of retirement at earlier retirement ages or years of service upon attaining retirement eligibility generally result in higher actuarially determined contributions, and vice versa.

The table below shows the number of actual Tier 1 retirements on a headcount basis during each year of the experience study period compared with the number expected under the current assumptions. There were more retirements than expected for police officers in each year of the experience study period. In total, there were fewer retirements than expected for the academic and non-academic groups during the experience study period.

	Academic			Non-Academic			Police		
	Tier 1 Normal Retirement								
Fiscal Year End	**Actual**	**Current Assumption**	**Actual/ Expected**	**Actual**	**Current Assumption**	**Actual/ Expected**	**Actual**	**Current Assumption**	**Actual/ Expected**
2021	896	828	1.1	1,054	1,112	0.9	22	17	1.3
2022	673	753	0.9	1,107	999	1.1	23	18	1.3
2023	594	749	0.8	815	962	0.8	22	18	1.2
Total	**2,163**	**2,329**	**0.9**	**2,976**	**3,074**	**1.0**	**67**	**52**	**1.3**
	Tier 1 Early Retirement								
2021	64	83	0.8	150	178	0.8	0	0	
2022	68	77	0.9	200	165	1.2	0	0	
2023	48	72	0.7	128	154	0.8	0	0	
Total	**180**	**232**	**0.8**	**478**	**498**	**1.0**	**0**	**0**	

Retirement Assumption

The table below shows the number of actual Tier 2 retirements on a headcount basis during each year of the experience study period compared with the number expected under the current assumptions. There were fewer retirements than expected for the academic group and for the non-academic group. There was only one Tier 2 retirement from the police officers during the experience study period, and therefore, not enough experience to review the Tier 2 retirement assumptions for the police officers group.

Fiscal Year End	Academic			Non-Academic			Police		
	Actual	Current Assumption	Actual/ Expected	Actual	Current Assumption	Actual/ Expected	Actual	Current Assumption	Actual/ Expected
Tier 2 Normal Retirement									
2021	4	5	0.8	4	10	0.4	1	0	6.7
2022	5	12	0.4	22	21	1.0	0	0	0.0
2023	9	16	0.6	29	34	0.8	0	0	0.0
Total	**18**	**34**	**0.5**	**55**	**65**	**0.8**	**1**	**1**	**1.3**
Tier 2 Early Retirement									
2021	0	4	0.0	2	18	0.1	0	0	
2022	4	7	0.6	14	36	0.4	0	1	0.0
2023	8	11	0.7	17	46	0.4	0	1	0.0
Total	**12**	**21**	**0.6**	**33**	**100**	**0.3**	**0**	**2**	**0.0**

Normal Retirement Experience – Tier 1

Current and past experience has shown that retirement rates under this plan are correlated with age. Currently, the Plan uses age-based rates with higher rates at key ages, with 100% retirement at age 80. In addition, the experience showed differences in retirement patterns between members classified as academic and not classified as academic in the census data. Based on the retirement experience, we recommend the following changes to the Tier 1 retirement rates:

- Applying separate rates to police officers and continue to apply separate rates for members classified as academic and non-academic (non-police officers)
- Decrease rates for members with 40 or more years of service and younger than age 80
    - If the member has 40 or more years of service and is younger than age 80 change the rate from 1.5 times the rate applicable to members with less than 40 years of service to 1.00 times the rate applicable to members with less than 40 years of service for the academic and non-academic groups.
- Assume that 100% of Police officers retire at age 70

The recommended changes to the retirement rates reflect the actual experience on a liability-weighted basis over the past three years from the current experience study and different patterns for members classified as academic, non-academic (non-police) and police officers.

Retirement Assumption

Applying the proposed Tier 1 retirement rates to historical data generates the following liability-weighted retirements by age at retirement:

	Liability-Weighted Retirements (Amounts in $100,000)								
	Academic			Non-Academic			Police		
Nearest Age	Actual	Current Assumption	Proposed Assumption	Actual	Current Assumption	Proposed Assumption	Actual	Current Assumption	Proposed Assumption
Under 50	0	0	0	138	141	141			
50-54	333	340	340	1,364	1,514	1,514	305	219	286
55-59	978	1,207	1,101	2,328	2,373	2,371	147	98	147
60-64	4,208	4,677	4,450	5,620	4,972	5,262	25	38	38
65-69	3,934	4,131	4,061	3,543	3,574	3,476	25	16	25
70-74	1,934	1,856	1,863	1,114	919	955	8	4	23
75-79	709	755	713	281	237	249	4	2	11
80+	189	1,300	1,300	61	338	338	5	9	9
Total	**12,285**	**14,266**	**13,828**	**14,448**	**14,068**	**14,306**	**519**	**386**	**539**
Under 80	**12,096**	**12,966**	**12,528**	**14,387**	**13,730**	**13,968**	**514**	**377**	**530**

Following is a comparison of the expected retirements based on the current and proposed assumptions shown separately by under 40 years of service and 40+ years of service.

Academic - Liability Weighted												
	Current Assumptions						Proposed Assumptions					
	Expected Retirements			Ratio of Actual/Expected			Expected Retirements			Ratio of Actual/Expected		
Age	Under 40	40+	Total	Under 40	40+	Total	Under 40	40+	Total	Under 40	40+	Total
50-54	340	0	340	1.0		1.0	340	0	340	1.0		1.0
55-59	1,207	0	1,207	0.8		0.8	1,101	0	1,101	0.9		0.9
60-64	4,664	13	4,677	0.9	0.0	0.9	4,441	9	4,449	0.9	0.0	0.9
65-69	3,922	208	4,130	1.0	0.4	1.0	3,922	138	4,061	1.0	0.6	1.0
70-74	1,417	439	1,856	1.2	0.6	1.0	1,541	322	1,863	1.1	0.9	1.0
75-79	378	376	754	1.2	0.7	0.9	428	284	712	1.1	0.9	1.0
80+	553	747	1,300	0.3	0.0	0.1	553	747	1,300	0.3	0.0	0.1
Total	12,480	1,783	14,263	0.9	0.3	0.9	12,326	1,500	13,826	0.9	0.4	0.9
Excluding 80+	11,927	1,036	12,963	1.0	0.6	0.9	11,773	753	12,527	1.0	0.8	1.0
Non-Academic - Liability Weighted												
	Current Assumptions						Proposed Assumptions					
	Expected Retirements			Ratio of Actual/Expected			Expected Retirements			Ratio of Actual/Expected		
Age	Under 40	40+	Total	Under 40	40+	Total	Under 40	40+	Total	Under 40	40+	Total
Under 50	141	0	141	1.0		1.0	141	0	141	1.0		1.0
50-54	1,514	0	1,514	0.9		0.9	1,514	0	1,514	0.9		0.9
55-59	2,364	9	2,373	1.0	0.0	1.0	2,364	6	2,370	1.0	0.0	1.0
60-64	4,838	134	4,972	1.1	0.9	1.1	5,163	98	5,261	1.1	1.2	1.1
65-69	3,278	296	3,574	1.0	0.6	1.0	3,278	197	3,475	1.0	0.8	1.0
70-74	768	150	919	1.3	0.6	1.2	845	110	955	1.2	0.8	1.2
75-79	208	30	237	1.2	0.8	1.2	229	22	250	1.1	1.2	1.1
80+	120	218	338	0.2	0.2	0.2	120	218	338	0.2	0.2	0.2
Total	13,231	837	14,068	1.1	0.5	1.0	13,654	651	14,306	1.0	0.7	1.0
Excluding 80+	13,111	619	13,730	1.1	0.6	1.0	13,534	433	13,968	1.0	0.9	1.0

Retirement Assumption

Normal Retirement Experience – Tier 2

There is limited Tier 2 normal retirement experience. Based on the limited experience, we have recommended changes to the Tier 2 retirement rate at age 67 based on experience and recommend setting the Tier 2 retirement rates for ages 68 and older to the Tier 1 rates. There was only one Tier 2 police officer retirement, and therefore, we did not review Tier 2 police officer retirement experience.

| | Liability-Weighted Retirements (Amounts in $100,000) | | | | | |
| | Academic | | | Non-Academic | | |
Nearest Age	Actual	Current Assumption	Proposed Assumption	Actual	Current Assumption	Proposed Assumption
67-69	10	16	14	38	43	39
70-74	0	7	7	11	11	12
75-79	3	0	0	3	1	3
80+	0	2	2	0	1	1
Total	**14**	**25**	**23**	**51**	**56**	**55**
Under 80	**14**	**23**	**21**	**51**	**55**	**54**

Early Retirement Experience – Tier 1

Fewer Academic participants retired under Tier 1 early retirement eligibility than expected under the current assumptions and more non-Academic participants retired under Tier 1 early retirement eligibility than expected under the current assumptions. We recommend changes in rates to reflect these differences.

| | Liability-Weighted Retirements (Amounts in $100,000) | | | | | |
| | Academic | | | Non-Academic | | |
Nearest Age	Actual	Current Assumption	Proposed Assumption	Actual	Current Assumption	Proposed Assumption
55	210	222	222	520	484	514
56	161	230	173	289	310	310
57	219	242	242	381	322	351
58	225	245	245	391	318	346
59	235	242	242	530	408	467
Total	**1,049**	**1,181**	**1,124**	**2,110**	**1,842**	**1,988**

Early Retirement Experience – Tier 2

There is limited Tier 2 early retirement experience. Based on the limited experience, we have recommended changes to the Tier 2 retirement rate at age 62 based on experience and minor changes to rates for Non-Academic members for ages 63 through 66.

Retirement Assumption

| | Liability-Weighted Retirements (Amounts in $100,000) | | | | | |
| | Academic | | | Non-Academic | | |
Nearest Age	Actual	Current Assumption	Proposed Assumption	Actual	Current Assumption	Proposed Assumption
62	2	9	5	1	47	27
63	5	4	4	7	19	15
64	3	5	5	8	17	14
65	2	4	4	11	15	12
66	4	4	4	9	13	11
Total	**17**	**25**	**22**	**36**	**112**	**79**

Retirement Experience and Recommendations

Experience during the last three years was considered in the analysis shown on the following pages. The "Exposure" column shows the number of employees eligible to retire at various years of service or ages throughout the experience period. An individual could potentially be counted up to three times if eligible each year in the period. By tabulating employees in this fashion we are able to answer the question "For all employees eligible at condition X, how many retired?"

The tables and graphs on the following pages show experience for normal and early retirement.

- Table and Graph II(a)(i) – Tier 1 Normal Retirement Experience – Academic
- Table and Graph II(a)(ii) – Tier 1 Normal Retirement Experience – Non-Academic
- Table and Graph II(a)(iii) – Tier 1 Normal Retirement Experience – Police Officers
- Table and Graph II(b)(i) – Tier 1 Early Retirement Experience – Academic and Non-Academic
- Table II(c) – Summary of Tier 1 Retirement Rates
- Table and Graph II(d)(i) – Tier 2 Normal Retirement Experience – Academic
- Table and Graph II(d)(ii) – Tier 2 Normal Retirement Experience – Non-Academic
- Table and Graph II(e)(i) – Tier 2 Early Retirement Experience – Academic and Non-Academic
- Table II(f) – Summary of Tier 2 Retirement Rates

Tier 1 Normal Retirement Assumption

Table II(a)(i)

Academic

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW				Proposed Assumptions - LW		
	Population-Weighted		Liability-Weighted (LW)		Rates Weighted by		Expected	Blended	Under 40 Years	Actual /	Expected		Actual /
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Assumed Rate	Assumed Rate	Expected	Retirements	Proposed Rate	Expected
Under 50	0	0	0	0			0		55.0%		0	55.0%	
50	1	0	19	0	0.0%	0.0%	10	52.8%	55.0%	0.0	10	55.0%	0.0
51	6	2	86	20	33.3%	23.1%	35	40.5%	40.0%	0.6	35	40.0%	0.6
52	15	5	179	127	33.3%	71.3%	71	39.7%	40.0%	1.8	71	40.0%	1.8
53	24	8	248	74	33.3%	30.0%	75	30.2%	30.0%	1.0	75	30.0%	1.0
54	43	10	497	111	23.3%	22.4%	149	30.0%	30.0%	0.7	149	30.0%	0.7
55	69	17	781	162	24.6%	20.8%	156	20.0%	20.0%	1.0	156	20.0%	1.0
56	66	13	812	137	19.7%	16.8%	162	20.0%	20.0%	0.8	146	18.0%	0.9
57	82	17	1,019	199	20.7%	19.5%	204	20.0%	20.0%	1.0	183	18.0%	1.1
58	117	13	1,503	149	11.1%	9.9%	301	20.0%	20.0%	0.5	271	18.0%	0.5
59	150	29	1,918	331	19.3%	17.3%	384	20.0%	20.0%	0.9	345	18.0%	1.0
60	1,266	153	7,809	914	12.1%	11.7%	1,015	13.0%	13.0%	0.9	937	12.0%	1.0
61	1,178	137	7,421	860	11.6%	11.6%	965	13.0%	13.0%	0.9	891	12.0%	1.0
62	1,196	144	7,092	673	12.0%	9.5%	922	13.0%	13.0%	0.7	851	12.0%	0.8
63	1,158	158	7,176	911	13.6%	12.7%	934	13.0%	13.0%	1.0	933	13.0%	1.0
64	1,067	149	6,443	851	14.0%	13.2%	841	13.1%	13.0%	1.0	838	13.0%	1.0
65	997	155	6,091	1,031	15.5%	16.9%	1,036	17.0%	17.0%	1.0	1,036	17.0%	1.0
66	907	161	5,142	863	17.8%	16.8%	888	17.3%	17.0%	1.0	874	17.0%	1.0
67	869	170	4,695	859	19.6%	18.3%	805	17.1%	17.0%	1.1	798	17.0%	1.1
68	793	134	4,188	689	16.9%	16.5%	732	17.5%	17.0%	0.9	712	17.0%	1.0
69	694	104	3,770	492	15.0%	13.1%	670	17.8%	17.0%	0.7	641	17.0%	0.8
70	628	110	3,293	588	17.5%	17.8%	597	18.1%	17.0%	1.0	560	17.0%	1.0
71	507	96	2,604	366	18.9%	14.1%	415	15.9%	15.0%	0.9	443	17.0%	0.8
72	426	65	2,113	396	15.3%	18.8%	341	16.1%	15.0%	1.2	359	17.0%	1.1
73	350	74	1,627	282	21.1%	17.3%	270	16.6%	15.0%	1.0	277	17.0%	1.0
74	278	62	1,320	302	22.3%	22.9%	233	17.7%	15.0%	1.3	224	17.0%	1.3
75	213	44	1,058	249	20.7%	23.5%	188	17.8%	15.0%	1.3	180	17.0%	1.4
76	170	26	915	88	15.3%	9.6%	166	18.1%	15.0%	0.5	156	17.0%	0.6
77	135	23	788	79	17.0%	10.1%	141	17.9%	15.0%	0.6	134	17.0%	0.6
78	115	21	873	205	18.3%	23.5%	160	18.3%	15.0%	1.3	148	17.0%	1.4
79	89	10	557	87	11.2%	15.7%	100	18.0%	15.0%	0.9	95	17.0%	0.9
80+	248	53	1,300	189	21.4%	14.6%	1,300	100.0%	100.0%	0.1	1,300	100.0%	0.1
Totals:	**13,857**	**2,163**	**83,337**	**12,285**	**15.6%**	**14.7%**	**14,266**	**17.1%**		**0.9**	**13,828**	**16.6%**	**0.9**
Excluding 80+:	**13,609**	**2,110**	**82,038**	**12,096**	**15.5%**	**14.7%**	**12,966**	**15.8%**		**0.9**	**12,528**	**15.3%**	**1.0**

Rates are for Tier 1 members only. Expected retirements for a member who has 40 or more years of service:
- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Separate retirement rates apply for Tier 2 members.

Tier 1 Normal Retirement Assumption

Graph II(a)(i)

Academic
Normal Retirement Experience
6/30/2020 - 6/30/2023

Rates are for Tier 1 members only. Expected retirements for a member who has 40 or more years of service:
- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Separate retirement rates apply for Tier 2 members.

Tier 1 Normal Retirement Assumption

Table II(a)(ii)

Non-Academic

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW				Proposed Assumptions - LW		
	Population-Weighted		Liability-Weighted (LW)		Rates Weighted by		Expected	Blended	Under 40 Years	Actual /	Expected		Actual /
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Assumed Rate	Proposed Rate	Expected	Retirements	Proposed Rate	Expected
Under 50	29	15	257	138	51.7%	53.6%	141	55.0%	55.0%	1.0	141	55.0%	1.0
50	37	10	283	66	27.0%	23.2%	113	40.0%	40.0%	0.6	113	40.0%	0.6
51	72	22	589	193	30.6%	32.8%	177	30.0%	30.0%	1.1	177	30.0%	1.1
52	105	38	867	277	36.2%	31.9%	260	30.0%	30.0%	1.1	260	30.0%	1.1
53	165	38	1,513	330	23.0%	21.8%	454	30.0%	30.0%	0.7	454	30.0%	0.7
54	193	59	1,700	499	30.6%	29.3%	510	30.0%	30.0%	1.0	510	30.0%	1.0
55	218	55	1,926	440	25.2%	22.8%	481	25.0%	25.0%	0.9	481	25.0%	0.9
56	218	66	1,978	560	30.3%	28.3%	495	25.0%	25.0%	1.1	495	25.0%	1.1
57	219	57	2,019	460	26.0%	22.8%	506	25.0%	25.0%	0.9	505	25.0%	0.9
58	204	52	1,810	498	25.5%	27.5%	454	25.1%	25.0%	1.1	453	25.0%	1.1
59	203	44	1,747	370	21.7%	21.2%	438	25.1%	25.0%	0.8	437	25.0%	0.8
60	1,701	268	7,218	1,382	15.8%	19.2%	1,446	20.0%	20.0%	1.0	1,444	20.0%	1.0
61	1,601	210	6,511	969	13.1%	14.9%	986	15.2%	15.0%	1.0	977	15.0%	1.0
62	1,604	272	6,266	1,198	17.0%	19.1%	949	15.1%	15.0%	1.3	1,065	17.0%	1.1
63	1,410	239	5,476	1,106	17.0%	20.2%	833	15.2%	15.0%	1.3	931	17.0%	1.2
64	1,288	223	4,971	965	17.3%	19.4%	757	15.2%	15.0%	1.3	845	17.0%	1.1
65	1,128	280	4,388	1,190	24.8%	27.1%	1,118	25.5%	25.0%	1.1	1,097	25.0%	1.1
66	924	234	3,451	978	25.3%	28.3%	888	25.7%	25.0%	1.1	863	25.0%	1.1
67	720	170	2,487	602	23.6%	24.2%	640	25.7%	25.0%	0.9	622	25.0%	1.0
68	591	124	1,999	495	21.0%	24.8%	519	26.0%	25.0%	1.0	500	25.0%	1.0
69	458	87	1,576	278	19.0%	17.7%	409	26.0%	25.0%	0.7	394	25.0%	0.7
70	394	96	1,388	331	24.4%	23.9%	289	20.8%	20.0%	1.1	305	22.0%	1.1
71	304	81	1,105	319	26.6%	28.9%	233	21.1%	20.0%	1.4	243	22.0%	1.3
72	240	59	759	223	24.6%	29.4%	163	21.5%	20.0%	1.4	167	22.0%	1.3
73	212	38	605	127	17.9%	20.9%	132	21.8%	20.0%	1.0	133	22.0%	1.0
74	189	38	485	113	20.1%	23.3%	101	20.9%	20.0%	1.1	107	22.0%	1.1
75	128	27	341	86	21.1%	25.3%	72	21.0%	20.0%	1.2	75	22.0%	1.1
76	92	13	248	50	14.1%	20.1%	52	20.9%	20.0%	1.0	54	22.0%	0.9
77	79	17	210	54	21.5%	25.7%	43	20.5%	20.0%	1.3	46	22.0%	1.2
78	70	14	209	44	20.0%	20.9%	42	20.2%	20.0%	1.0	46	22.0%	1.0
79	38	8	129	47	21.1%	36.7%	29	22.3%	20.0%	1.6	28	22.0%	1.7
80+	110	22	338	61	20.0%	17.9%	338	100.0%	100.0%	0.2	338	100.0%	0.2
Totals:	14,944	2,976	64,850	14,448	19.9%	22.3%	14,068	21.7%		1.0	14,306	22.1%	1.0
Excluding 80+:	14,834	2,954	64,512	14,387	19.9%	22.3%	13,730	21.3%		1.0	13,968	21.7%	1.0

Rates are for Tier 1 members only. Expected retirements for a member who has 40 or more years of service:
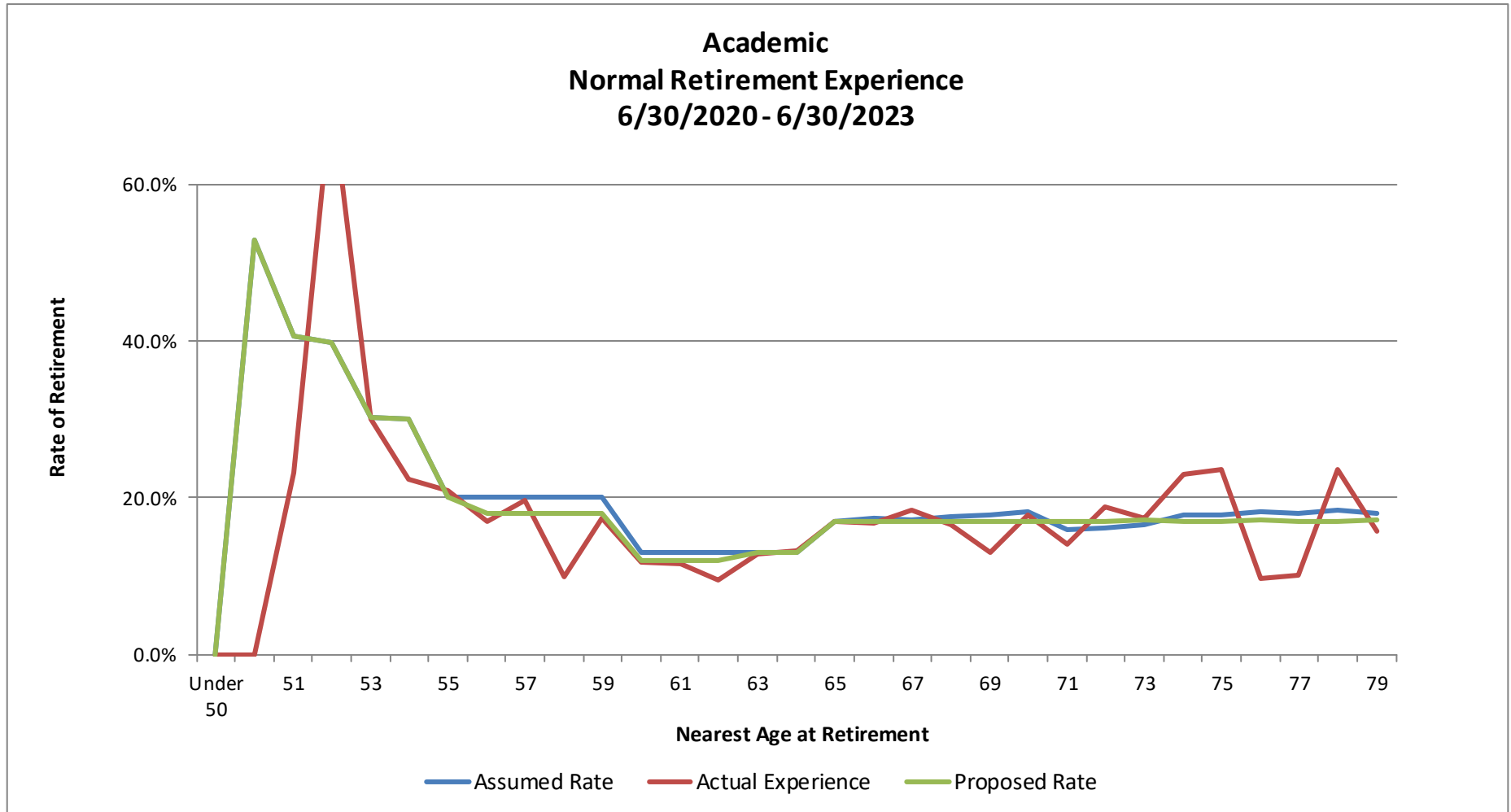- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Separate retirement rates apply for Tier 2 members.

Graph II(a)(ii)

Non-Academic
Normal Retirement Experience
6/30/2020 - 6/30/2023

Rates are for Tier 1 members only. Expected retirements for a member who has 40 or more years of service:

- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Separate retirement rates apply for Tier 2 members.

Tier 1 Normal Retirement Assumption

Table II(a)(iIi)

Police

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW				Proposed Assumptions - LW		
	Population Weighted		Liability Weighted (LW)		Rates Weighted by		Expected	Blended	Under 40 Years	Actual /	Expected	All Years	Actual /
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Assumed Rate	Proposed Rate	Expected	Retirements	Proposed Rate	Expected
50	12	6	142	79	50.0%	55.4%	57	40.1%	40.0%	1.4	71	50.0%	1.1
51	9	1	95	11	11.1%	11.6%	29	30.5%	30.0%	0.4	38	40.0%	0.3
52	15	5	186	68	33.3%	36.4%	56	30.2%	30.0%	1.2	74	40.0%	0.9
53	12	8	167	100	66.7%	59.7%	50	30.0%	30.0%	2.0	67	40.0%	1.5
54	8	5	90	48	62.5%	53.0%	27	30.0%	30.0%	1.8	36	40.0%	1.3
55	16	8	147	74	50.0%	50.6%	37	25.2%	25.0%	2.0	73	50.0%	1.0
56	10	3	89	25	30.0%	27.8%	22	24.8%	25.0%	1.1	27	30.0%	0.9
57	9	3	94	32	33.3%	34.4%	23	24.5%	25.0%	1.4	28	30.0%	1.2
58	4	2	35	11	50.0%	33.0%	9	25.9%	25.0%	1.3	10	30.0%	1.1
59	5	1	30	4	20.0%	15.0%	7	23.5%	25.0%	0.6	9	30.0%	0.5
60	18	2	63	10	11.1%	15.6%	13	20.5%	20.0%	0.8	13	20.0%	0.8
61	12	3	32	4	25.0%	13.7%	5	15.7%	15.0%	0.9	5	15.0%	0.9
62	11	1	40	2	9.1%	5.2%	6	15.1%	15.0%	0.3	6	15.0%	0.3
63	13	3	47	9	23.1%	18.7%	7	15.0%	15.0%	1.3	7	15.0%	1.3
64	10	0	48	0	0.0%	0.0%	7	14.7%	15.0%	0.0	7	15.0%	0.0
65	8	4	21	9	50.0%	40.9%	5	23.7%	25.0%	1.7	8	40.0%	1.1
66	2	0	5	0	0.0%	0.0%	1	21.2%	25.0%	0.0	2	40.0%	0.0
67	7	2	13	6	28.6%	47.1%	3	24.0%	25.0%	2.0	5	40.0%	1.2
68	7	2	15	8	28.6%	51.6%	4	25.8%	25.0%	2.0	6	40.0%	1.3
69	6	2	11	2	33.3%	22.5%	3	27.8%	25.0%	0.8	4	40.0%	0.6
70	5	1	8	1	20.0%	13.9%	2	26.1%	20.0%	0.5	8	100.0%	0.1
71	1	0	2	0	0.0%	0.0%	0	0.0%	20.0%		2	100.0%	0.0
72	1	0	2	0	0.0%	0.0%	0	0.0%	20.0%		2	100.0%	0.0
73	1	1	7	7	100.0%	100.0%	1	15.2%	20.0%	6.6	7	100.0%	0.9
74	3	0	4	0	0.0%	0.0%	1	25.0%	20.0%	0.0	4	100.0%	0.0
75	3	1	5	2	33.3%	41.6%	1	18.6%	20.0%	2.2	5	100.0%	0.4
76	1	1	2	2	100.0%	100.0%	0	0.0%	20.0%		2	100.0%	1.1
77	0	0	0	0			0		20.0%		0	100.0%	
78	0	0	0	0			0		20.0%		0	100.0%	
79	1	0	4	0	0.0%	0.0%	1	25.2%	20.0%	0.0	4	100.0%	0.0
80+	2	1	9	5	50.0%	51.8%	9	100.3%	100.0%	0.5	9	100.0%	0.5
Totals:	**212**	**66**	**1,411**	**519**	**0.0%**	**36.8%**	**386**	**27.4%**		**1.3**	**539**	**38.2%**	**1.0**
Excluding 80+:	**210**	**65**	**1,402**	**514**	**50.0%**	**36.7%**	**377**	**26.9%**		**1.4**	**530**	**37.8%**	**1.0**

Rates are for Tier 1 members only. Expected retirements for a member who has 40 or more years of service:
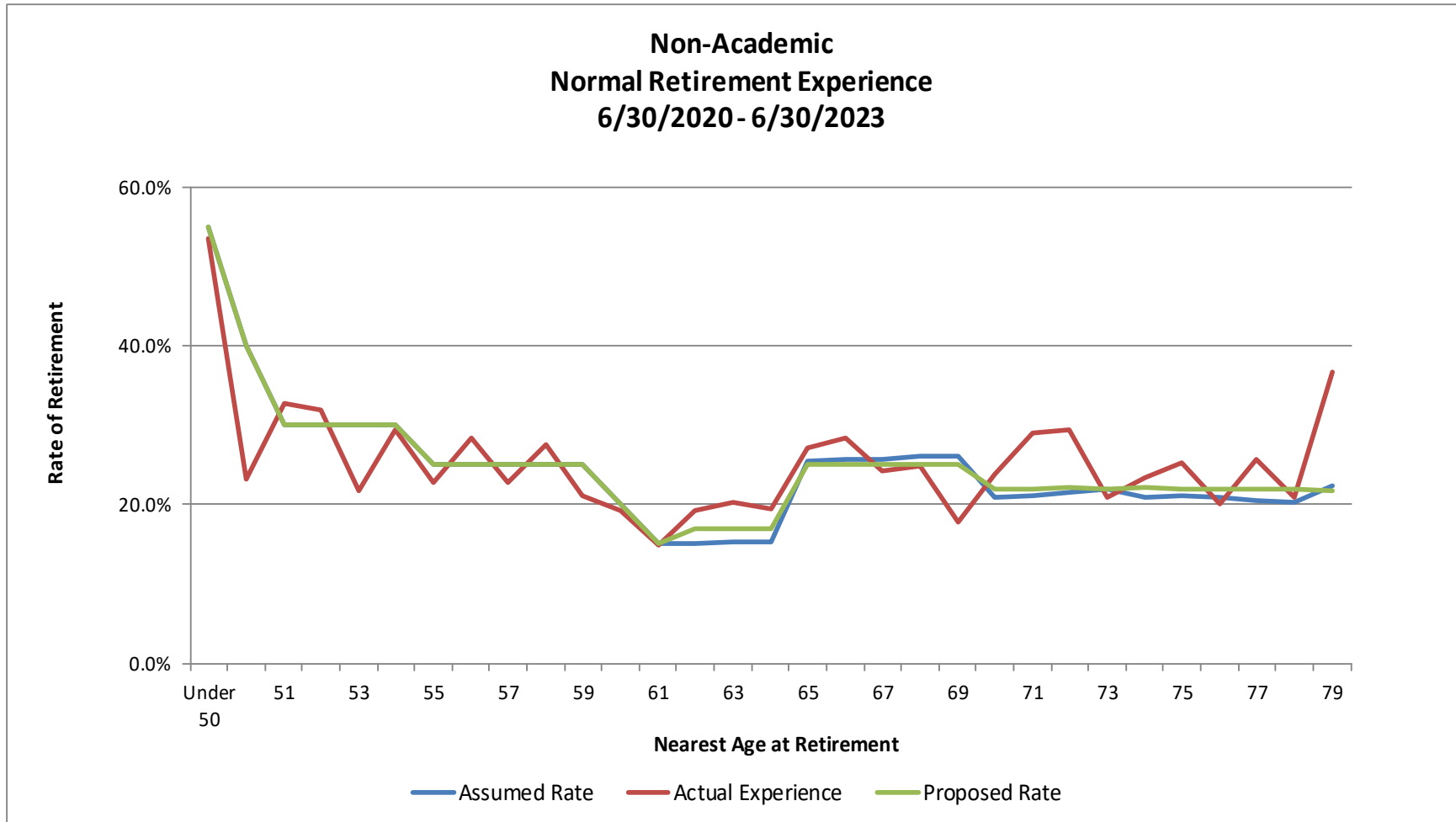
- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Separate retirement rates apply for Tier 2 members.

Tier 1 Normal Retirement Assumption

Graph II(a)(ili)

Police
Normal Retirement Experience
6/30/2020 - 6/30/2023

Rates are for Tier 1 members only. Expected retirements for a member who has 40 or more years of service:
- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Separate retirement rates apply for Tier 2 members.

Tier 1 Early Retirement Assumption

Academic

Table II(b)(i)

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW			Proposed Assumptions - LW		
	Population Weighted		Liability Weighted (LW)		Rates Weighted by		Expected	Assumed	Actual /	Expected	Proposed	Actual /
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Rate	Expected	Retirements	Rate	Expected
55	1,163	35	5,543	210	3.0%	3.8%	222	4.0%	0.9	222	4.0%	0.9
56	1,147	32	5,758	161	2.8%	2.8%	230	4.0%	0.7	173	3.0%	0.9
57	1,154	30	6,041	219	2.6%	3.6%	242	4.0%	0.9	242	4.0%	0.9
58	1,169	37	6,130	225	3.2%	3.7%	245	4.0%	0.9	245	4.0%	0.9
59	1,161	46	6,051	235	4.0%	3.9%	242	4.0%	1.0	242	4.0%	1.0
Totals:	**5,794**	**180**	**29,524**	**1,049**	**3.1%**	**3.6%**	**1,181**	**4.0%**	**0.9**	**1,124**	**3.8%**	**0.9**

Non-Academic

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW			Proposed Assumptions - LW		
	Population Weighted		Liability Weighted (LW)		Rates Weighted by		Expected	Assumed	Actual /	Expected	Proposed	Actual /
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Rate	Expected	Retirements	Rate	Expected
55	1,636	120	6,049	520	7.3%	8.6%	484	8.0%	1.1	514	8.5%	1.0
56	1,553	73	5,639	289	4.7%	5.1%	310	5.5%	0.9	310	5.5%	0.9
57	1,582	76	5,849	381	4.8%	6.5%	322	5.5%	1.2	351	6.0%	1.1
58	1,549	93	5,773	391	6.0%	6.8%	318	5.5%	1.2	346	6.0%	1.1
59	1,561	116	5,832	530	7.4%	9.1%	408	7.0%	1.3	467	8.0%	1.1
Totals:	**7,881**	**478**	**29,142**	**2,110**	**6.1%**	**7.2%**	**1,842**	**6.3%**	**1.1**	**1,988**	**6.8%**	**1.1**

Rates are for Tier 1 members only.
Separate retirement rates apply for Tier 2 members.
Current assumptions and proposed assumptions are based on liability weighting.

Tier 1 Early Retirement Assumption

Graph II(b)(i)

Academic
Early Retirement Experience
6/30/2020 - 6/30/2023

Non-Academic
Early Retirement Experience
6/30/2020 - 6/30/2023

Current assumptions and proposed assumptions are based on liability weighting.

Tier 1 Retirement Assumption Summary

Table II(c)

Nearest Age @ Retirement	Tier 1 - Normal (Unreduced) Retirement							Tier 1 - Early (Reduced) Retirement			
	Current Rates				Proposed Rates			Current Rates		Proposed Rates	
	Academic		Non-Academic		Academic	Police	Non-Academic	Academic	Non-Academic	Academic	Non-Academic
	Under 40 Years	40+ Years	Under 40 Years	40+ Years	All Years	All Years	All Years				
Under 50	55.0%		55.0%		55.0%		55.0%				
50	55.0%		40.0%		55.0%	50.0%	40.0%				
51	40.0%		30.0%		40.0%	40.0%	30.0%				
52	40.0%		30.0%		40.0%	40.0%	30.0%				
53	30.0%		30.0%		30.0%	40.0%	30.0%				
54	30.0%		30.0%		30.0%	40.0%	30.0%				
55	20.0%	30.0%	25.0%	37.5%	20.0%	50.0%	25.0%	4.0%	8.0%	4.0%	8.5%
56	20.0%	30.0%	25.0%	37.5%	18.0%	30.0%	25.0%	4.0%	5.5%	3.0%	5.5%
57	20.0%	30.0%	25.0%	37.5%	18.0%	30.0%	25.0%	4.0%	5.5%	4.0%	6.0%
58	20.0%	30.0%	25.0%	37.5%	18.0%	30.0%	25.0%	4.0%	5.5%	4.0%	6.0%
59	20.0%	30.0%	25.0%	37.5%	18.0%	30.0%	25.0%	4.0%	7.0%	4.0%	8.0%
60	13.0%	19.5%	20.0%	30.0%	12.0%	20.0%	20.0%				
61	13.0%	19.5%	15.0%	22.5%	12.0%	15.0%	15.0%				
62	13.0%	19.5%	15.0%	22.5%	12.0%	15.0%	17.0%				
63	13.0%	19.5%	15.0%	22.5%	13.0%	15.0%	17.0%				
64	13.0%	19.5%	15.0%	22.5%	13.0%	15.0%	17.0%				
65	17.0%	25.5%	25.0%	37.5%	17.0%	40.0%	25.0%				
66	17.0%	25.5%	25.0%	37.5%	17.0%	40.0%	25.0%				
67	17.0%	25.5%	25.0%	37.5%	17.0%	40.0%	25.0%				
68	17.0%	25.5%	25.0%	37.5%	17.0%	40.0%	25.0%				
69	17.0%	25.5%	25.0%	37.5%	17.0%	40.0%	25.0%				
70	17.0%	25.5%	20.0%	30.0%	17.0%	100.0%	22.0%				
71-79	15.0%	22.5%	20.0%	30.0%	17.0%	100.0%	22.0%				
80+	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%				

Non-Academic rates are used for members who are Police Officers for the current rates.

Rates for an academic or non-academic member who has 40 or more years of service:
- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*
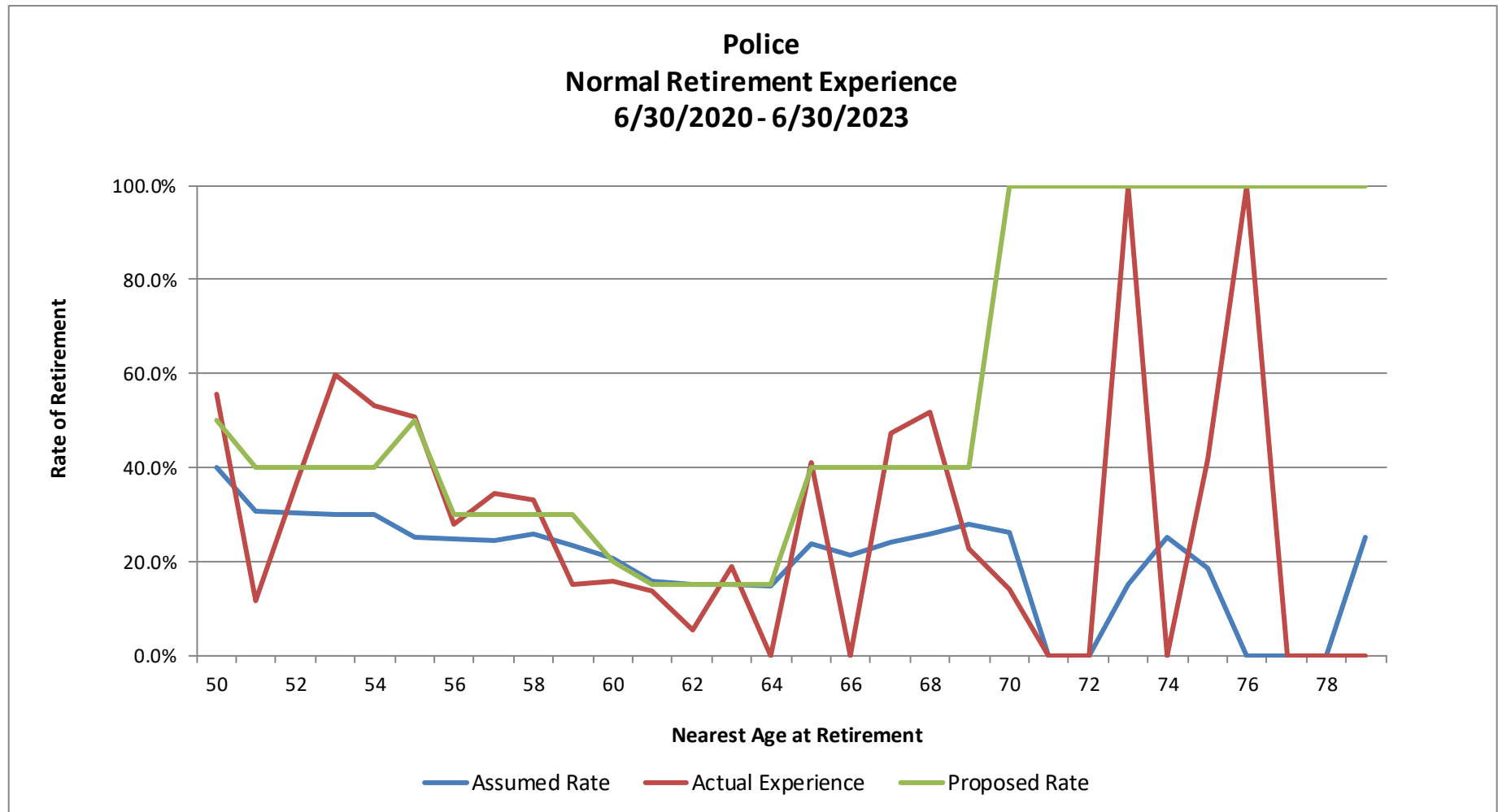
Tier 2 Normal Retirement Assumption

Academic   **Table II(d)(i)**

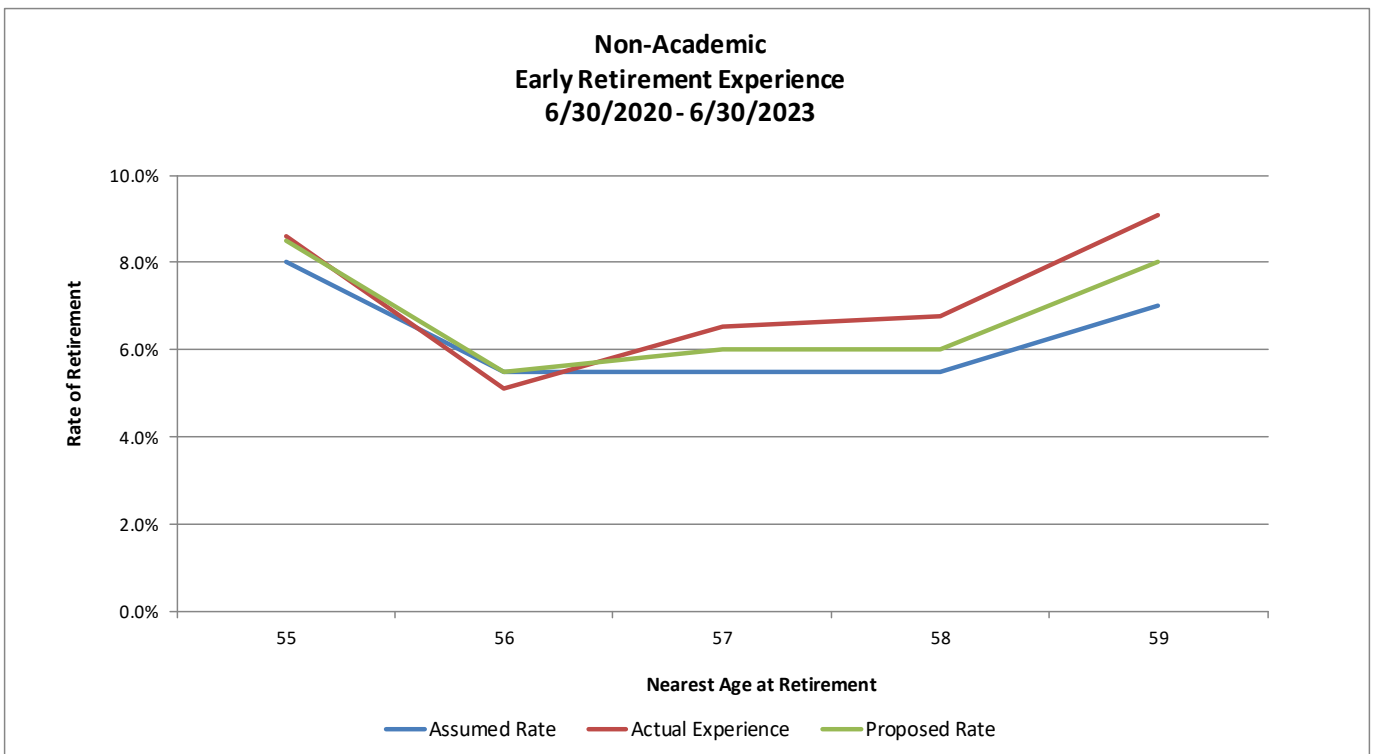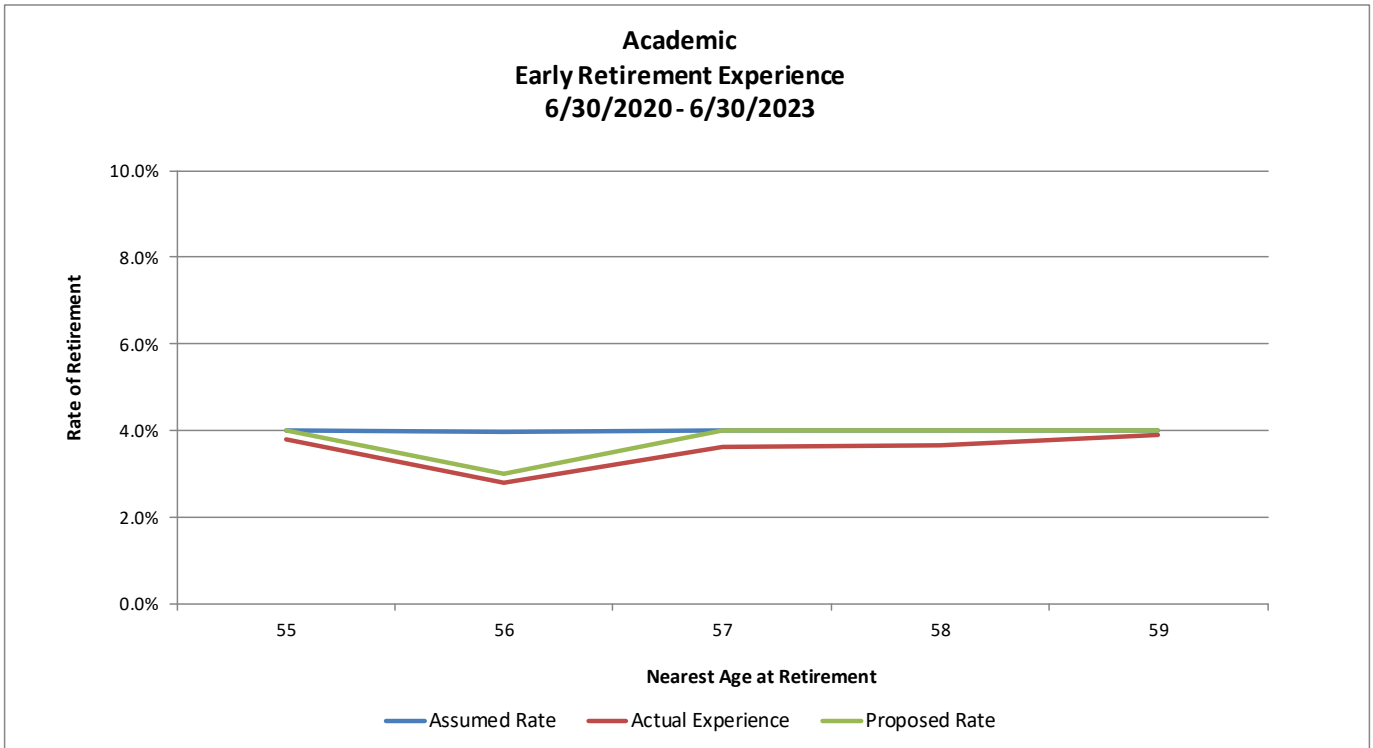| Nearest Age	Actual Experience						Current Assumptions - LW			Proposed Assumptions - LW		
	Population Weighted		Liability Weighted (LW)		Rates Weighted by		Expected		Actual /	Expected		Actual /
@ Retirement	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Assumed Rate	Expected	Retirements	Proposed Rate	Expected
67	29	4	31	6	13.8%	19.6%	11	35.0%	0.5	9	30.0%	0.7
68	21	3	19	2	14.3%	10.7%	3	17.0%	0.7	3	17.0%	0.7
69	15	3	12	2	20.0%	20.4%	2	17.0%	1.2	2	17.0%	1.2
70	11	1	10	0	9.1%	4.6%	2	17.0%	0.2	2	17.0%	0.2
71	11	0	11	0	0.0%	0.0%	2	15.0%	0.0	2	17.0%	0.0
72	11	0	7	0	0.0%	0.0%	1	15.0%	0.0	1	17.0%	0.0
73	7	0	5	0	0.0%	0.0%	1	15.0%	0.0	1	17.0%	0.0
74	8	0	4	0	0.0%	0.0%	1	15.0%	0.0	1	17.0%	0.0
75	3	0	2	0	0.0%	0.0%	0	15.0%		0	17.0%	
76	2	0	1	0	0.0%	0.0%	0	15.0%		0	17.0%	
77	5	0	3	0	0.0%	0.0%	0	15.0%		0	17.0%	
78	4	1	2	0	25.0%	30.2%	0	15.0%		0	17.0%	
79	5	4	2	2	80.0%	90.7%	0	15.0%		0	17.0%	
80+	7	0	2	0	0.0%	0.0%	2	100.0%	0.0	2	100.0%	0.0
Totals:	**139**	**16**	**110**	**14**	**11.5%**	**12.4%**	**25**	**22.7%**	**0.5**	**23**	**20.9%**	**0.6**
Excluding 80+:	**132**	**16**	**108**	**14**	**12.1%**	**12.6%**	**23**	**21.3%**	**0.6**	**21**	**19.4%**	**0.7**

Rates are for Tier 2 members only.

Separate retirement rates apply for Tier 1 members.

Current assumptions and proposed assumptions are based on liability weighting.

Graph II(d)(i)

Academic - Tier 2
Normal Retirement Experience
6/30/2020 - 6/30/2023

Tier 2 Normal Retirement Assumption

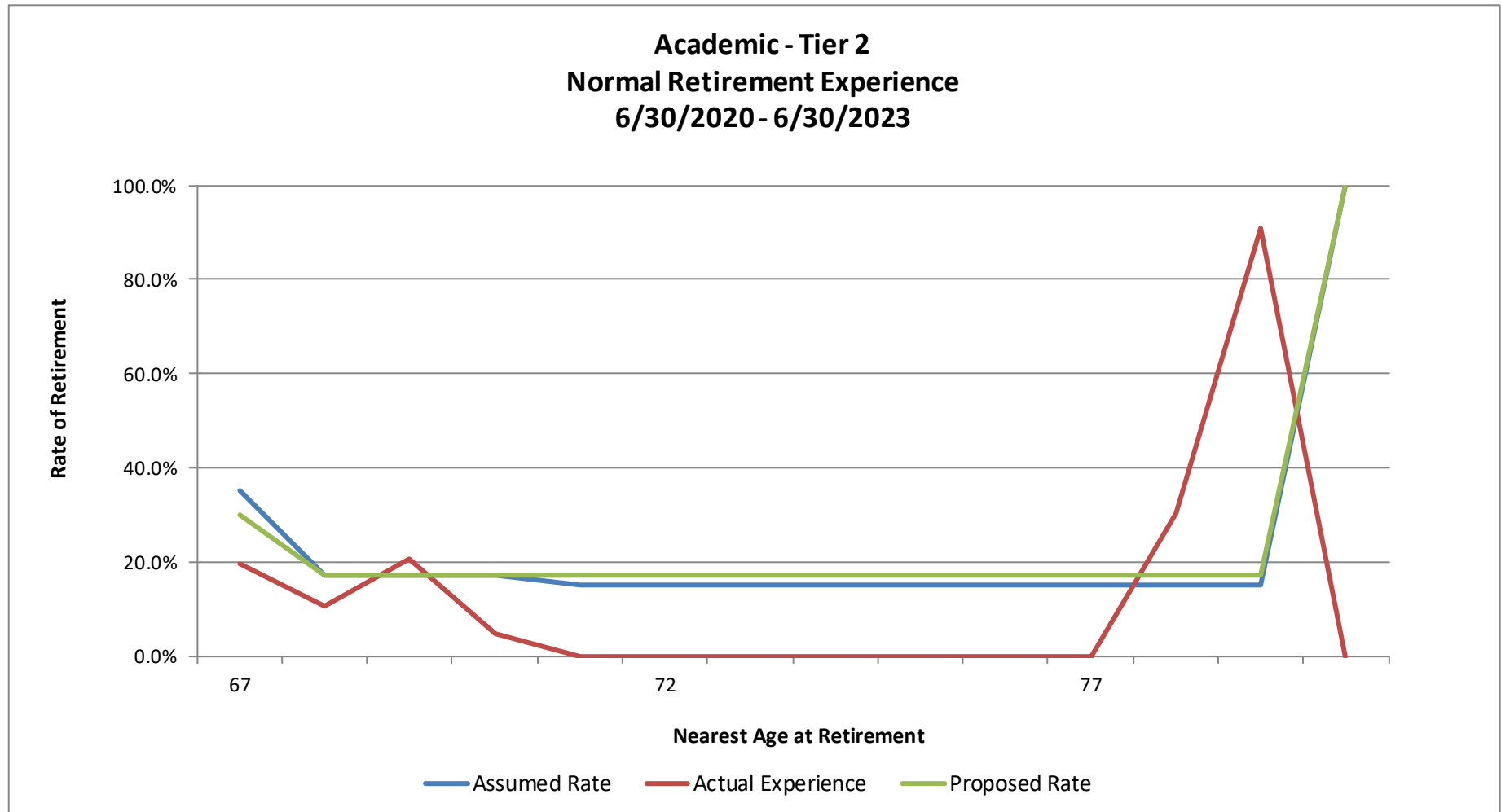| Nearest Age | Actual Experience | | | | | | Current Assumptions - LW | | | Proposed Assumptions - LW | | |
| | Population Weighted | | Liability Weighted (LW) | | Rates Weighted by | | Expected | | Actual / | Expected | | Actual / |
@ Retirement	Exposures	Retirements	Exposures	Retirements	Population	Liabilities	Retirements	Assumed Rate	Expected	Retirements	Proposed Rate	Expected
67	62	16	71	18	25.8%	25.4%	25	35.0%	0.7	21	30.0%	0.9
68	42	8	42	9	19.0%	21.8%	10	25.0%	0.9	10	25.0%	0.9
69	35	11	31	11	31.4%	35.1%	8	25.0%	1.3	8	25.0%	1.3
70	22	4	18	2	18.2%	12.7%	4	20.0%	0.6	4	22.0%	0.6
71	20	4	15	3	20.0%	20.5%	3	20.0%	1.0	3	22.0%	1.0
72	16	4	12	4	25.0%	35.3%	2	20.0%	2.0	3	22.0%	1.4
73	9	2	5	1	22.2%	30.4%	1	20.0%	1.4	1	22.0%	1.4
74	7	0	4	0	0.0%	0.0%	1	20.0%	0.0	1	22.0%	0.0
75	6	2	5	2	33.3%	39.5%	1	20.0%	1.8	1	22.0%	1.8
76	4	0	2	0	0.0%	0.0%	0	20.0%		1	22.0%	0.0
77	7	0	2	0	0.0%	0.0%	0	20.0%		1	22.0%	0.0
78	6	1	2	1	16.7%	32.6%	0	20.0%		0	22.0%	
79	5	1	2	0	20.0%	12.4%	0	20.0%		0	22.0%	
80+	4	0	1	0	0.0%	0.0%	1	100.0%	0.0	1	100.0%	0.0
Totals:	**245**	**53**	**211**	**51**	**21.6%**	**24.4%**	**56**	**26.6%**	**0.9**	**55**	**26.1%**	**0.9**
Excluding 80+:	**241**	**53**	**209**	**51**	**22.0%**	**24.5%**	**55**	**26.3%**	**0.9**	**54**	**25.8%**	**1.0**

Rates are for Tier 2 members only.

Separate retirement rates apply for Tier 1 members.

Current assumptions and proposed assumptions are based on liability weighting.

Tier 2 Normal Retirement Assumption

Graph II(d)(ii)

Non-Academic - Tier 2
Normal Retirement Experience
6/30/2020 - 6/30/2023
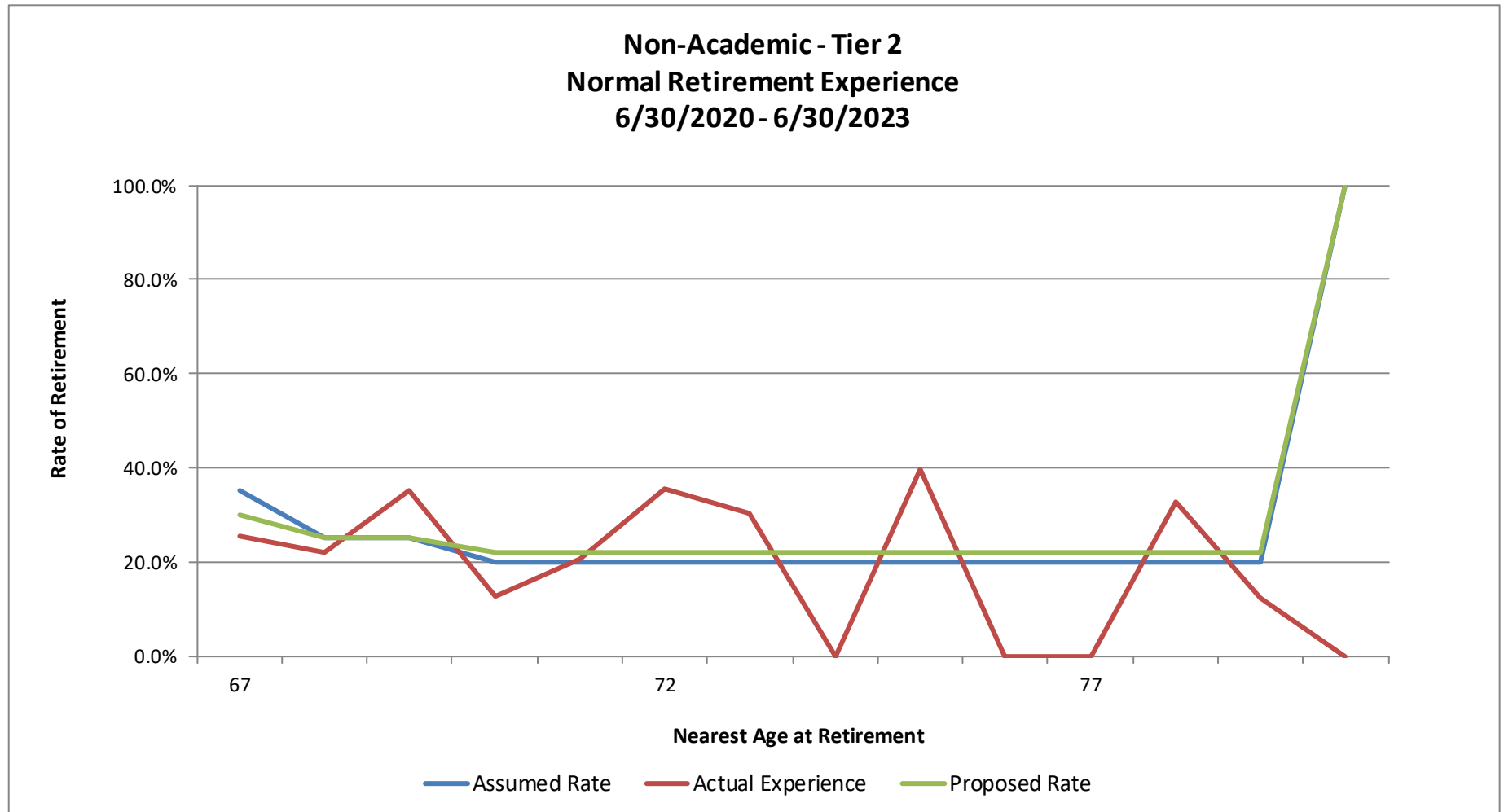
Tier 2 Early Retirement Assumption

Academic

Table II(e)(i)

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW			Proposed Assumptions - LW		
	Population Weighted		Liability Weighted (LW)		Rates Weighted by		Expected Retirements	Assumed Rate	Actual / Expected	Expected Retirements	Proposed Rate	Actual / Expected
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities						
62	29	1	34	2	3.4%	6.0%	9	25.0%	0.2	5	15.0%	0.4
63	34	3	40	5	8.8%	12.3%	4	10.0%	1.2	4	10.0%	1.2
64	39	2	48	3	5.1%	7.3%	5	10.0%	0.7	5	10.0%	0.7
65	35	2	43	2	5.7%	5.1%	4	10.0%	0.5	4	10.0%	0.5
66	30	4	36	4	13.3%	11.9%	4	10.0%	1.2	4	10.0%	1.2
Totals:	**167**	**12**	**201**	**17**	**7.2%**	**8.4%**	**25**	**12.6%**	**0.7**	**22**	**10.9%**	**0.8**

Non-Academic

Nearest Age @ Retirement	Actual Experience						Current Assumptions - LW			Proposed Assumptions - LW		
	Population Weighted		Liability Weighted (LW)		Rates Weighted by		Expected Retirements	Assumed Rate	Actual / Expected	Expected Retirements	Proposed Rate	Actual / Expected
	Exposures	Retirements	Exposures	Retirements	Population	Liabilities						
62	119	1	135	1	0.8%	0.4%	47	35.0%	0.0	27	20.0%	0.0
63	118	8	129	7	6.8%	5.8%	19	15.0%	0.4	15	12.0%	0.5
64	105	7	115	8	6.7%	7.3%	17	15.0%	0.5	14	12.0%	0.6
65	90	8	99	11	8.9%	11.3%	15	15.0%	0.8	12	12.0%	0.9
66	78	9	90	9	11.5%	9.9%	13	15.0%	0.7	11	12.0%	0.8
Totals:	**510**	**33**	**568**	**36**	**6.5%**	**6.4%**	**112**	**19.7%**	**0.3**	**79**	**13.9%**	**0.5**

Rates are for Tier 2 members only.
Separate retirement rates apply for Tier 1 members.
Current assumptions and proposed assumptions are based on liability weighting.

State Universities Retirement System of Illinois   - 51 -
2024 Experience Review

Tier 2 Early Retirement Assumption

Graph II(e)(i)

Academic - Tier 2
Early Retirement Experience
6/30/2020 - 6/30/2023

Non-Academic - Tier 2
Early Retirement Experience
6/30/2020 - 6/30/2023
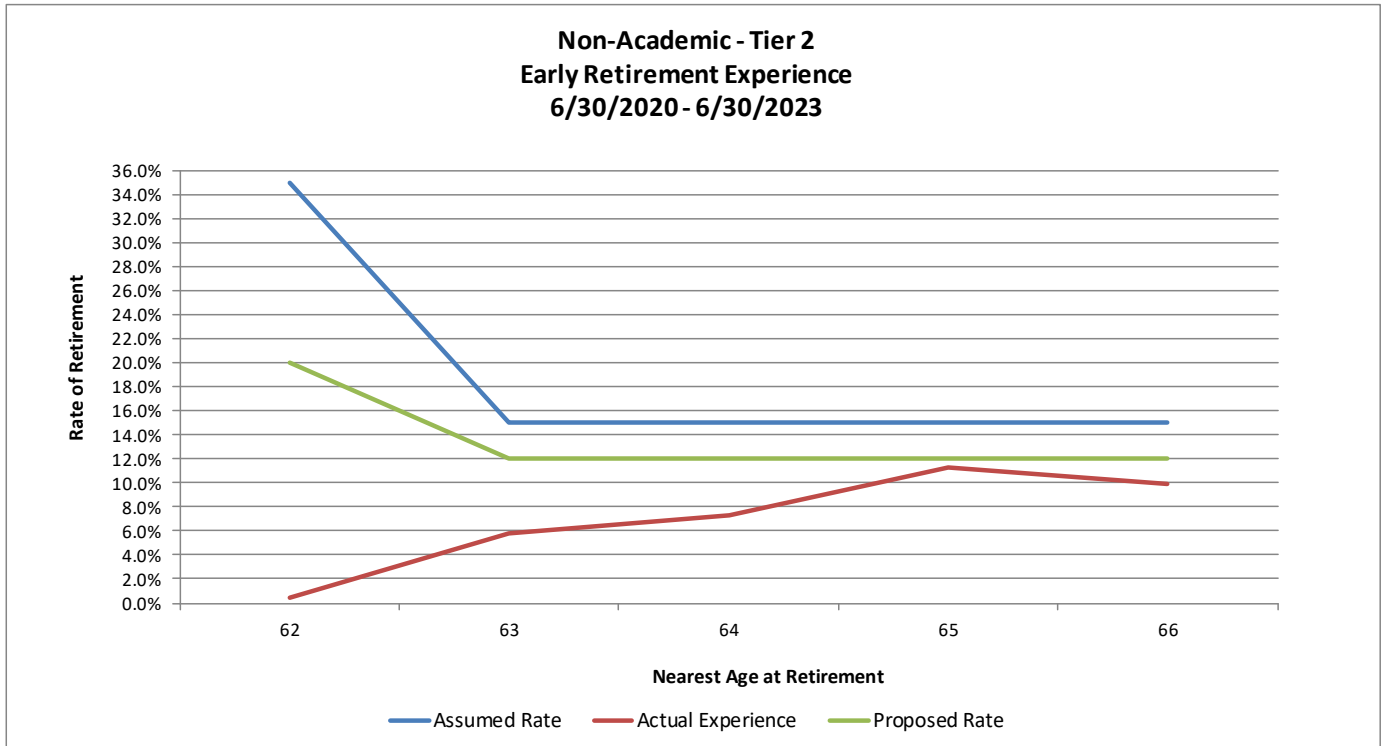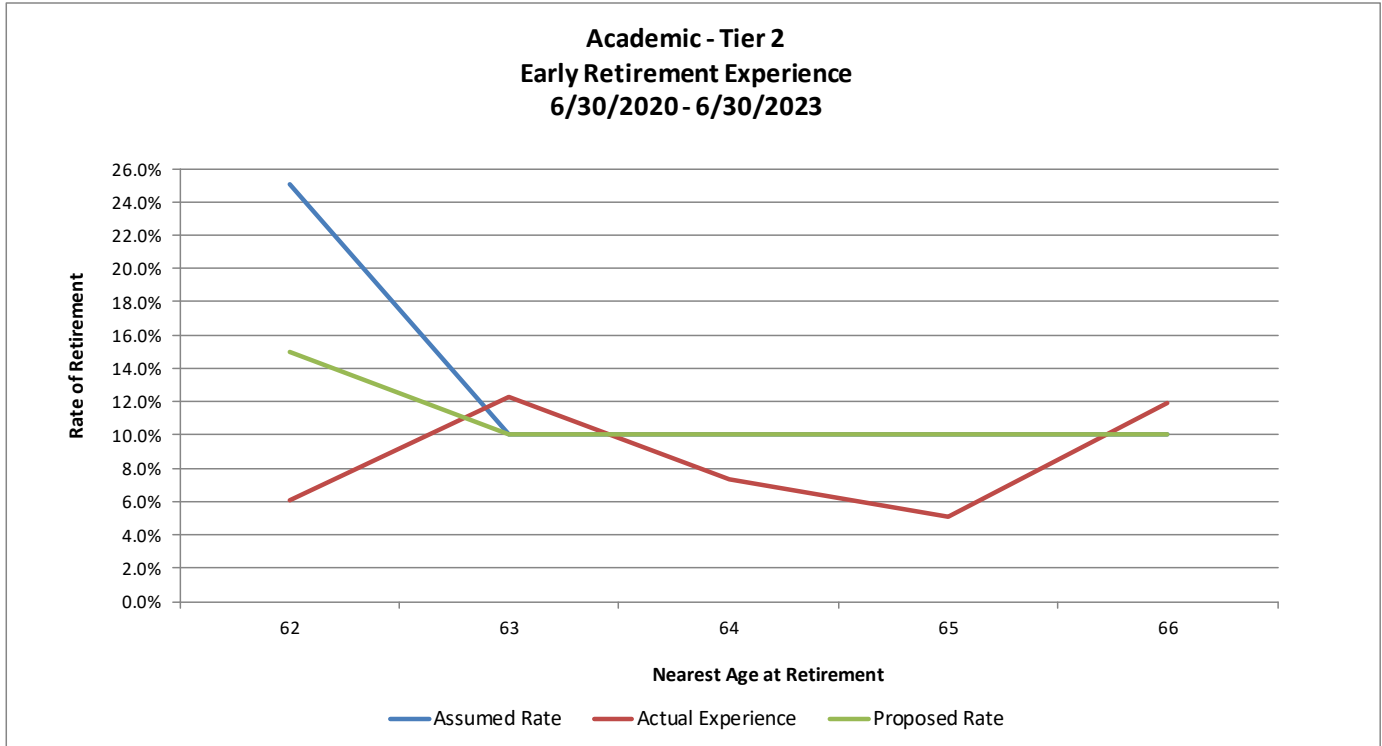
Current assumptions and proposed assumptions are based on liability weighting.

Tier 2 Retirement Assumption Summary

Table II(f)

Nearest Age @ Retirement	Tier 2 - Normal Retirement						Tier 2 - Early Retirement			
	Current Rates		Proposed Rates		Current Rate	Proposed Rate	Current Rates		Proposed Rates	
	Academic	Non-Academic	Academic	Non-Academic	Police	Police	Academic	Non-Academic	Academic	Non-Academic
60					60.0%	60.0%				
61					25.0%	25.0%				
62					25.0%	25.0%	25.0%	35.0%	15.0%	20.0%
63					25.0%	25.0%	10.0%	15.0%	10.0%	12.0%
64					25.0%	25.0%	10.0%	15.0%	10.0%	12.0%
65					15.0%	15.0%	10.0%	15.0%	10.0%	12.0%
66					15.0%	15.0%	10.0%	15.0%	10.0%	12.0%
67	35.0%	35.0%	30.0%	30.0%	15.0%	15.0%				
68	17.0%	25.0%	17.0%	25.0%	15.0%	25.0%				
69	17.0%	25.0%	17.0%	25.0%	15.0%	25.0%				
70	17.0%	20.0%	17.0%	22.0%	15.0%	100.0%				
71	15.0%	20.0%	17.0%	22.0%	15.0%					
72	15.0%	20.0%	17.0%	22.0%	15.0%					
73	15.0%	20.0%	17.0%	22.0%	15.0%					
74	15.0%	20.0%	17.0%	22.0%	15.0%					
75	15.0%	20.0%	17.0%	22.0%	15.0%					
76	15.0%	20.0%	17.0%	22.0%	15.0%					
77	15.0%	20.0%	17.0%	22.0%	15.0%					
78	15.0%	20.0%	17.0%	22.0%	15.0%					
79	15.0%	20.0%	17.0%	22.0%	15.0%					
80+	100.0%	100.0%	100.0%	100.0%	100.0%					

Rates for an academic or non-academic member who has 40 or more years of service:
- *1.5 times the rate for under 40 years of service under the current assumptions (younger than age 80)*
- *The same rate as 40 years of service under the proposed assumptions*

Turnover Assumption

Turnover

Turnover experience during the last three years was considered in the analysis shown on the following pages. The "Exposure" column shows the number of employees at various years of service throughout the experience period.

The "Turnover" column shows the number of employees at various years of service who have gone from active status for reasons other than retirement and death. This includes members moving to inactive status as well as members terminating and receiving a refund of contributions.

Typically, we would consider a status change from active to inactive a termination in developing turnover rates. However, because some of these participants return to active status and accrue additional benefits, we have considered this in our analysis of turnover experience. The "Net Turnover" column shows the number of employees, by years of service, who went from inactive to active status between the experience study period of June 30, 2020, and June 30, 2023. While these participants are not necessarily the same exact participants who went to inactive status during the experience study period, we believe that using this data helps us develop proposed net effective turnover rates.

There were fewer terminations than expected under the current assumptions. Based on our analysis, we recommend maintaining service-based rates and making the following changes to the turnover rates:

- Slight decrease in rates at most years of service; and
- Maintain a pattern of decreasing termination rates by years of service.

In addition, we recommend continuing to assume that members who are eligible for a deferred benefit elect the option that is more valuable – return of contributions or a deferred benefit. This will provide a level of conservatism in the actuarial valuation.

The tables and graphs on the following pages show termination experience by service, including the impact of members returning from inactive to active status.

- Table III(a) and Graph III(a) – Termination Experience by Service – Academic
- Table III(b) and Graph III(b) – Termination Experience by Service – Non-Academic
- Table III(c) and Graph III(c) – Termination Experience by 5-Year Service Bands – Academic and Non-Academic

Turnover Assumption

Table III(a)

Academic

Service	Actual Experience Population-Weighted				Actual Experience Liability-Weighted				Current Assumptions Liability-Weighted			Proposed Assumptions Liability-Weighted		
BOY	Exposures	Turnover	Net Turnover[1]	Actual Rate	Exposures	Net Turnover[1]	Actual Rate		Expected Turnover	Assumed Rate	Actual / Expected[1]	Expected Turnover	Proposed Rate	Actual / Expected[2]
0	443	200	60	13.54%	27	2	6.39%		4	15.00%	0.4	4	15.00%	0.4
1	2,289	600	483	21.10%	152	17	11.36%		23	15.00%	0.7	23	15.00%	0.7
2	2,455	324	156	6.35%	314	32	10.06%		38	12.00%	0.8	35	11.00%	0.9
3	3,519	581	444	12.62%	597	59	9.95%		66	11.00%	0.9	60	10.00%	1.0
4	3,305	546	430	13.01%	750	62	8.30%		75	10.00%	0.8	68	9.00%	0.9
5	2,861	383	295	10.31%	913	63	6.92%		82	9.00%	0.8	73	8.00%	0.9
6	2,660	326	262	9.85%	1,124	70	6.25%		90	8.00%	0.8	79	7.00%	0.9
7	2,481	251	194	7.82%	1,311	72	5.47%		92	7.00%	0.8	79	6.00%	0.9
8	2,324	222	179	7.70%	1,550	69	4.44%		93	6.00%	0.7	85	5.50%	0.8
9	2,066	173	144	6.97%	1,683	75	4.44%		84	5.00%	0.9	84	5.00%	0.9
10	1,893	145	109	5.76%	2,152	87	4.06%		86	4.00%	1.0	86	4.00%	1.0
11	1,802	121	84	4.66%	2,679	68	2.55%		107	4.00%	0.6	94	3.50%	0.7
12	1,701	110	72	4.23%	3,356	81	2.40%		101	3.00%	0.8	101	3.00%	0.8
13	1,661	99	85	5.12%	3,885	104	2.68%		117	3.00%	0.9	97	2.50%	1.1
14	1,580	84	54	3.42%	4,268	104	2.43%		128	3.00%	0.8	107	2.50%	1.0
15	1,487	58	44	2.96%	4,474	68	1.52%		112	2.50%	0.6	89	2.00%	0.8
16	1,404	59	42	2.99%	4,806	94	1.95%		120	2.50%	0.8	96	2.00%	1.0
17	1,300	49	36	2.77%	4,870	108	2.21%		122	2.50%	0.9	97	2.00%	1.1
18	1,222	33	25	2.05%	5,208	62	1.19%		130	2.50%	0.5	104	2.00%	0.6
19	1,150	35	29	2.52%	5,376	77	1.44%		134	2.50%	0.6	108	2.00%	0.7
20	1,021	22	15	1.47%	5,266	46	0.87%		105	2.00%	0.4	79	1.50%	0.6
21	908	24	18	1.98%	4,846	57	1.18%		97	2.00%	0.6	73	1.50%	0.8
22	768	19	12	1.56%	4,598	35	0.76%		92	2.00%	0.4	69	1.50%	0.5
23	658	15	13	1.98%	4,299	43	1.00%		86	2.00%	0.5	64	1.50%	0.7
24	533	10	8	1.50%	3,936	53	1.36%		79	2.00%	0.7	59	1.50%	0.9
25	469	7	6	1.28%	3,761	24	0.64%		56	1.50%	0.4	47	1.25%	0.5
26	428	5	5	1.17%	3,762	13	0.36%		56	1.50%	0.2	47	1.25%	0.3
27	376	8	5	1.33%	3,711	60	1.62%		56	1.50%	1.1	46	1.25%	1.3
28	326	9	6	1.84%	3,288	26	0.79%		49	1.50%	0.5	41	1.25%	0.6
29	76	4	4	5.26%	719	21	2.88%		11	1.50%	1.9	9	1.25%	2.3
Totals:	**45,166**	**4,522**	**3,319**	**7.35%**	**87,683**	**1,753**	**2.00%**		**2,491**	**2.84%**	**0.7**	**2,103**	**2.40%**	**0.8**

[1] Reflects actual turnover net of inactive members who returned to active service.
[2] Actual to expected ratio based on net turnover.

Turnover Assumption

Graph III(a)

**Academic
Liability-Weighted Turnover Experience (Net)
6/30/2020 - 6/30/2023**

Turnover Assumption

Table III(b)

Non-Academic

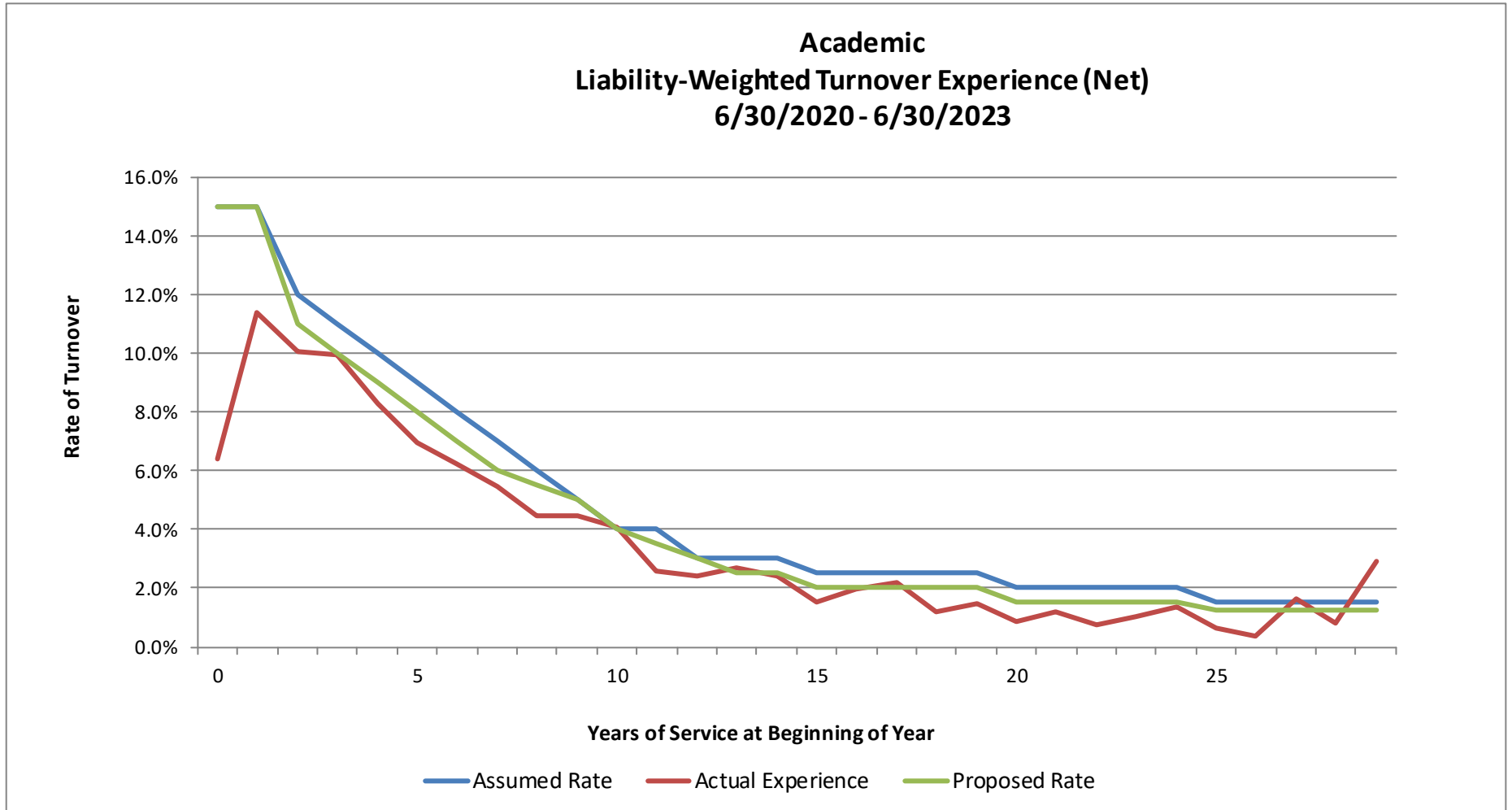| Service	Actual Experience Population-Weighted				Actual Experience Liability-Weighted				Current Assumptions Liability-Weighted			Proposed Assumptions Liability-Weighted		
BOY	Exposures	Turnover	Net Turnover[1]	Actual Rate	Exposures	Net Turnover[1]	Actual Rate		Expected Turnover	Assumed Rate	Actual / Expected[1]	Expected Turnover	Proposed Rate	Actual / Expected[2]
0	3,610	1,022	716	19.83%	256	16	6.40%		38	15.00%	0.4	36	14.00%	0.5
1	10,600	2,322	2,103	19.84%	708	83	11.76%		106	15.00%	0.8	99	14.00%	0.8
2	10,319	1,864	1,707	16.54%	1,167	160	13.71%		175	15.00%	0.9	163	14.00%	1.0
3	9,322	1,693	1,555	16.68%	1,706	234	13.69%		239	14.00%	1.0	222	13.00%	1.1
4	7,176	1,110	982	13.68%	1,890	211	11.15%		227	12.00%	0.9	227	12.00%	0.9
5	5,613	804	731	13.02%	1,968	208	10.57%		197	10.00%	1.1	207	10.50%	1.0
6	5,028	588	525	10.44%	2,264	186	8.23%		204	9.00%	0.9	192	8.50%	1.0
7	4,588	416	366	7.98%	2,570	176	6.84%		206	8.00%	0.9	193	7.50%	0.9
8	4,540	365	322	7.09%	3,084	185	5.99%		216	7.00%	0.9	200	6.50%	0.9
9	3,955	267	235	5.94%	3,137	155	4.95%		188	6.00%	0.8	188	6.00%	0.8
10	3,456	256	222	6.42%	3,501	195	5.58%		175	5.00%	1.1	175	5.00%	1.1
11	2,681	188	153	5.71%	3,547	169	4.78%		177	5.00%	1.0	177	5.00%	1.0
12	2,419	131	113	4.67%	4,194	189	4.51%		147	3.50%	1.3	168	4.00%	1.1
13	2,591	124	100	3.86%	5,087	152	2.98%		178	3.50%	0.9	153	3.00%	1.0
14	2,737	119	95	3.47%	6,081	172	2.83%		213	3.50%	0.8	182	3.00%	0.9
15	2,679	116	98	3.66%	6,719	211	3.14%		202	3.00%	1.0	202	3.00%	1.0
16	2,262	79	61	2.70%	6,245	145	2.33%		187	3.00%	0.8	156	2.50%	0.9
17	1,955	63	50	2.56%	6,087	136	2.24%		183	3.00%	0.7	152	2.50%	0.9
18	1,707	54	41	2.40%	5,816	116	1.99%		174	3.00%	0.7	145	2.50%	0.8
19	1,747	47	33	1.89%	6,561	114	1.74%		197	3.00%	0.6	164	2.50%	0.7
20	1,848	66	56	3.03%	7,435	198	2.67%		149	2.00%	1.3	149	2.00%	1.3
21	1,677	43	30	1.79%	7,116	139	1.95%		142	2.00%	1.0	142	2.00%	1.0
22	1,450	29	23	1.59%	6,568	104	1.59%		131	2.00%	0.8	131	2.00%	0.8
23	1,184	29	23	1.94%	5,823	111	1.90%		116	2.00%	1.0	116	2.00%	1.0
24	984	19	15	1.52%	5,108	88	1.72%		102	2.00%	0.9	102	2.00%	0.9
25	871	12	9	1.03%	4,954	49	0.98%		74	1.50%	0.7	62	1.25%	0.8
26	828	10	8	0.97%	5,124	45	0.87%		77	1.50%	0.6	64	1.25%	0.7
27	714	9	5	0.70%	4,910	32	0.66%		74	1.50%	0.4	61	1.25%	0.5
28	630	6	3	0.48%	4,651	28	0.60%		70	1.50%	0.4	58	1.25%	0.5
29	160	8	7	4.38%	1,239	62	5.04%		19	1.50%	3.3	15	1.25%	4.2
Totals:	**99,331**	**11,859**	**10,387**	**10.46%**	**125,515**	**4,070**	**3.24%**		**4,583**	**3.65%**	**0.9**	**4,301**	**3.43%**	**0.9**

[1] Reflects actual turnover net of inactive members who returned to active service.

[2] Actual to expected ratio based on net turnover.

Turnover Assumption

Graph III(b)

Non-Academic
Liability-Weighted Turnover Experience (Net)
6/30/2020 - 6/30/2023

Turnover Assumption

Table III(c)

Academic

Service	Actual Experience Population-Weighted				Actual Experience Liability-Weighted				Current Assumptions Liability-Weighted			Proposed Assumptions Liability-Weighted		
BOY	Exposures	Turnover	Net Turnover[1]	Actual Rate	Exposures	Net Turnover[1]	Actual Rate		Expected Turnover	Assumed Rate	Actual / Expected[1]	Expected Turnover	Proposed Rate	Actual / Expected[2]
0-4	12,011	2,251	1,573	13.10%	1,841	172	9.36%		206	11.19%	0.8	190	10.32%	0.9
5-9	12,392	1,355	1,074	8.67%	6,581	349	5.30%		441	6.70%	0.8	400	6.08%	0.9
10-14	8,637	559	404	4.68%	16,340	444	2.72%		539	3.30%	0.8	485	2.97%	0.9
15-19	6,563	234	176	2.68%	24,734	409	1.65%		618	2.50%	0.7	494	2.00%	0.8
20-24	3,888	90	66	1.70%	22,946	234	1.02%		459	2.00%	0.5	344	1.50%	0.7
25-29	1,675	33	26	1.55%	15,241	145	0.95%		228	1.50%	0.6	190	1.25%	0.8
Totals:	**45,166**	**4,522**	**3,319**	**7.35%**	**87,683**	**1,753**	**2.00%**		**2,491**	**2.84%**	**0.7**	**2,103**	**2.40%**	**0.8**

Non-Academic

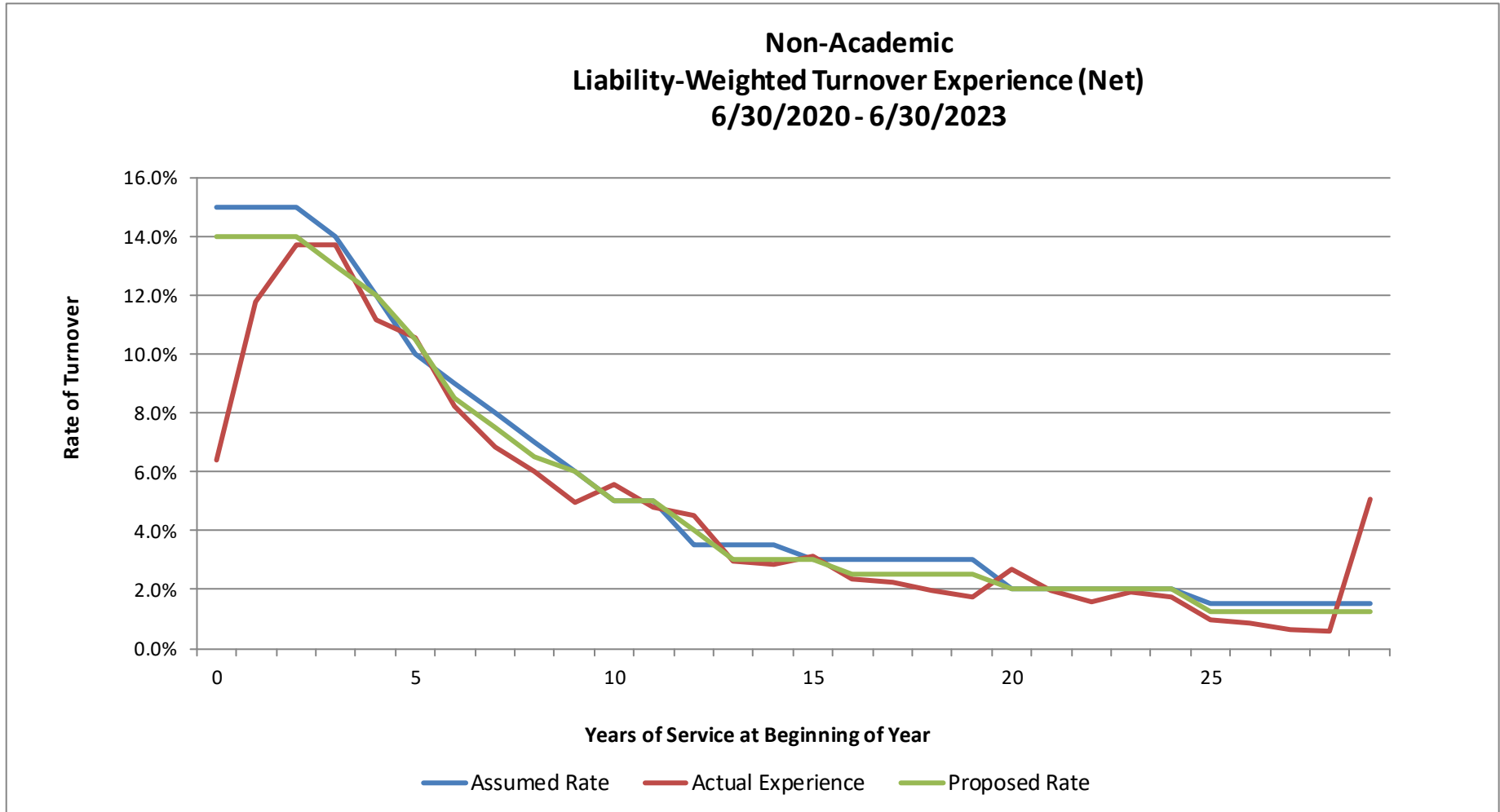| Service	Actual Experience Population-Weighted				Actual Experience Liability-Weighted				Current Assumptions Liability-Weighted			Proposed Assumptions Liability-Weighted		
BOY	Exposures	Turnover	Net Turnover[1]	Actual Rate	Exposures	Net Turnover[1]	Actual Rate		Expected Turnover	Assumed Rate	Actual / Expected[1]	Expected Turnover	Proposed Rate	Actual / Expected[2]
0-4	41,027	8,011	7,063	17.22%	5,727	704	12.29%		785	13.71%	0.9	747	13.04%	0.9
5-9	23,724	2,440	2,179	9.18%	13,023	910	6.99%		1,011	7.76%	0.9	980	7.53%	0.9
10-14	13,884	818	683	4.92%	22,409	877	3.92%		890	3.97%	1.0	855	3.82%	1.0
15-19	10,350	359	283	2.73%	31,428	722	2.30%		943	3.00%	0.8	819	2.61%	0.9
20-24	7,143	186	147	2.06%	32,049	640	2.00%		640	2.00%	1.0	640	2.00%	1.0
25-29	3,203	45	32	1.00%	20,878	216	1.03%		314	1.50%	0.7	260	1.25%	0.8
Totals:	**99,331**	**11,859**	**10,387**	**10.46%**	**125,515**	**4,070**	**3.24%**		**4,583**	**3.65%**	**0.9**	**4,301**	**3.43%**	**0.9**

[1] Reflects actual turnover net of inactive members who returned to active service.

[2] Actual to expected ratio based on net turnover.

Turnover Assumption

Graph III(c)

Actual Experience - Academic vs. Non-Academic
Liability-Weighted Turnover Experience (Net)
5-Year Service Bands
6/30/2020 - 6/30/2023

Legend:
— Actual Experience - Academic — Actual Experience - Non-Academic

X-axis: Years of Service at Beginning of Year (0-4, 5-9, 10-14, 15-19, 20-24, 25-29)
Y-axis: Rate of Turnover (0.0% to 14.0%)
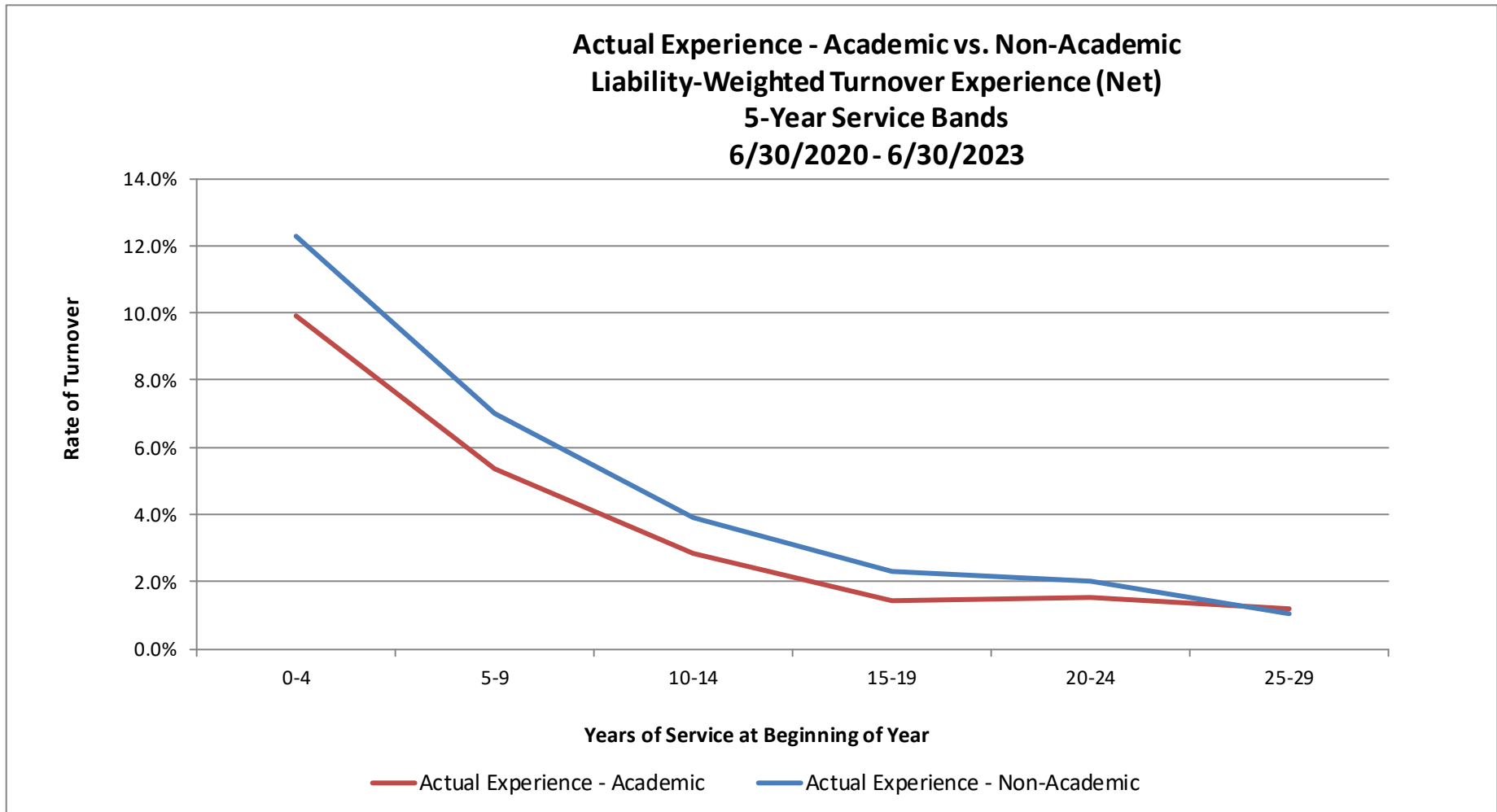
Disability Assumption

Disability

Disability experience during the last three years was considered in the analysis shown on the following pages. The "Exposure" column shows the number of employees in five-year age bands throughout the experience period.

We reviewed historical disability experience over the past 11 years and found that a high percentage of members receiving disability benefits cease receiving disability benefits and either return to active status or are classified as inactive status. Therefore, in addition to reviewing the number of new disabilities each year from active status, we reviewed the number of "net disabilities" each year. "Net disabilities" are disabilities that are expected to be long-term and exclude the incidences of disability where the benefits ceased. In addition, there are members who start receiving disability benefits who were classified as either active members or inactive members in the previous actuarial valuation. Therefore, we considered this in recommending disability rates. Approximately 55-60% of disabled members (on average) do not maintain their disabled status and return to active or inactive status. Therefore, we recommend maintaining proposed rates that are 60% of the recommended rates we would have proposed based on actual disability experience (without consideration of disabilities that cease). The rate of 60% is slightly higher than the actual rate of 55% (on average over the 11-year period) to account for the short-term cost for the disabled members who subsequently change from disabled status after receiving disability benefits.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total 11-Year	13-17	18-20	21-23
New Disabilities from Active Status	126	95	114	137	96	102	73	69	54	77	78	1021	568	244	209
Return to Active Status	39	32	28	17	45	35	34	24	17	19	20	310	161	93	56
Change to Terminated Status	51	53	35	43	33	25	30	21	26	25	31	373	215	76	82
Net Disabilities	36	10	51	77	18	42	9	24	11	33	27	338	192	75	71
Net Disabilities as % of New Disabilities from Active	29%	11%	45%	56%	19%	41%	12%	35%	20%	43%	35%	33%	34%	31%	34%
New Disabilities from Inactive Status	47	41	42	47	39	56	34	47	42	53	48	496	216	137	143
Net Disabilities from Active and Inactive Status	83	51	93	124	57	98	43	71	53	86	75	834	408	212	214
Net Disabilities as % of New Disabilities from Active and Inactive	48%	38%	60%	67%	42%	62%	40%	61%	55%	66%	60%	55%	52%	56%	61%

The tables and graphs on the following pages show experience for disability.

- Table and Graph IV(a) – Male Disability Experience – Academic
- Table and Graph IV(b) – Female Disability Experience – Academic
- Table and Graph IV(c) – Male Disability Experience – Non-Academic
- Table and Graph IV(d) – Female Disability Experience – Non-Academic

The disability experience reflected on the following pages does not include disability experience for the RSP. The RSP disability assumption was separately studied and a separate report was issued.

Disability Assumption

We recommend no changes to the male disability rates and slight decreases to the female disability rates.

We recommend that 200% of the Non-Academic rates be used for the Police group. Due to the small size of the group and limited credibility of the data, we have not included detailed experience exhibits. The total population-weighted disability rates for male Police officers was about 0.3% and the total population-weighted disability rates for female Police officers was about 0.8% during the disability period.

Disability Assumption

Table IV(a)

Academic – Male

Age @ Disablement	Actual Experience								Current Assumptions - LW			Proposed Assumptions - LW		
	Population-Weighted			Liability-Weighted (LW)			Net Rates Weighted by		Expected Disabilities	Assumed Rate	Actual (Net)/ Expected	Expected Disabilities	Proposed Rate	Actual (Net)/ Expected
	Exposures	Disabilities	Net Disabilities	Exposures	Disabilities	Net Disabilities	Population	Liabilities						
Under 20	0	0	0	0	0	0			0			0		
20-25	41	0	0	2	0	0	0.0000%	0.0000%	0	0.0080%	0.0	0	0.0080%	0.0
25-29	310	0	0	26	0	0	0.0000%	0.0000%	0	0.0088%	0.0	0	0.0088%	0.0
30-34	1,282	0	0	259	0	0	0.0000%	0.0000%	0	0.0107%	0.0	0	0.0107%	0.0
35-39	2,352	1	1	1,187	0	0	0.0255%	0.0165%	0	0.0134%	1.2	0	0.0134%	1.2
40-44	3,492	0	0	3,979	0	0	0.0000%	0.0000%	1	0.0203%	0.0	1	0.0203%	0.0
45-49	3,583	1	1	8,042	3	2	0.0167%	0.0227%	2	0.0302%	0.8	2	0.0302%	0.8
50-54	4,004	2	1	13,640	13	8	0.0300%	0.0567%	6	0.0411%	1.4	6	0.0411%	1.4
55-59	3,781	1	1	19,400	8	5	0.0159%	0.0250%	9	0.0466%	0.5	9	0.0466%	0.5
60-64	3,537	1	1	20,881	1	1	0.0170%	0.0039%	10	0.0466%	0.1	10	0.0466%	0.1
65+	4,506	0	0	25,398	0	0	0.0000%	0.0000%	12	0.0466%	0.0	12	0.0466%	0.0
Totals:	**26,888**	**6**	**4**	**92,815**	**26**	**15**	**0.0134%**	**0.0166%**	**40**	**0.0427%**	**0.4**	**40**	**0.0427%**	**0.4**
Excluding 60+	**18,845**	**5**	**3**	**46,535**	**24**	**15**	**0.0159%**	**0.0314%**	**18**	**0.0388%**	**0.8**	**18**	**0.0388%**	**0.8**
Under 40	**3,985**	**1**	**1**	**1,474**	**0**	**0**	**0.0151%**	**0.0133%**	**0**	**0.0128%**	**1.0**	**0**	**0.0128%**	**1.0**
40-49	**7,075**	**1**	**1**	**12,020**	**3**	**2**	**0.0085%**	**0.0152%**	**3**	**0.0269%**	**0.6**	**3**	**0.0269%**	**0.6**
50-59	**7,785**	**3**	**2**	**33,041**	**21**	**13**	**0.0231%**	**0.0381%**	**15**	**0.0443%**	**0.9**	**15**	**0.0443%**	**0.9**
60+	**8,043**	**1**	**1**	**46,280**	**1**	**1**	**0.0075%**	**0.0018%**	**22**	**0.0466%**	**0.0**	**22**	**0.0466%**	**0.0**

Disability rates vary by age. Average rates for the five-year age bands are shown in the table above.
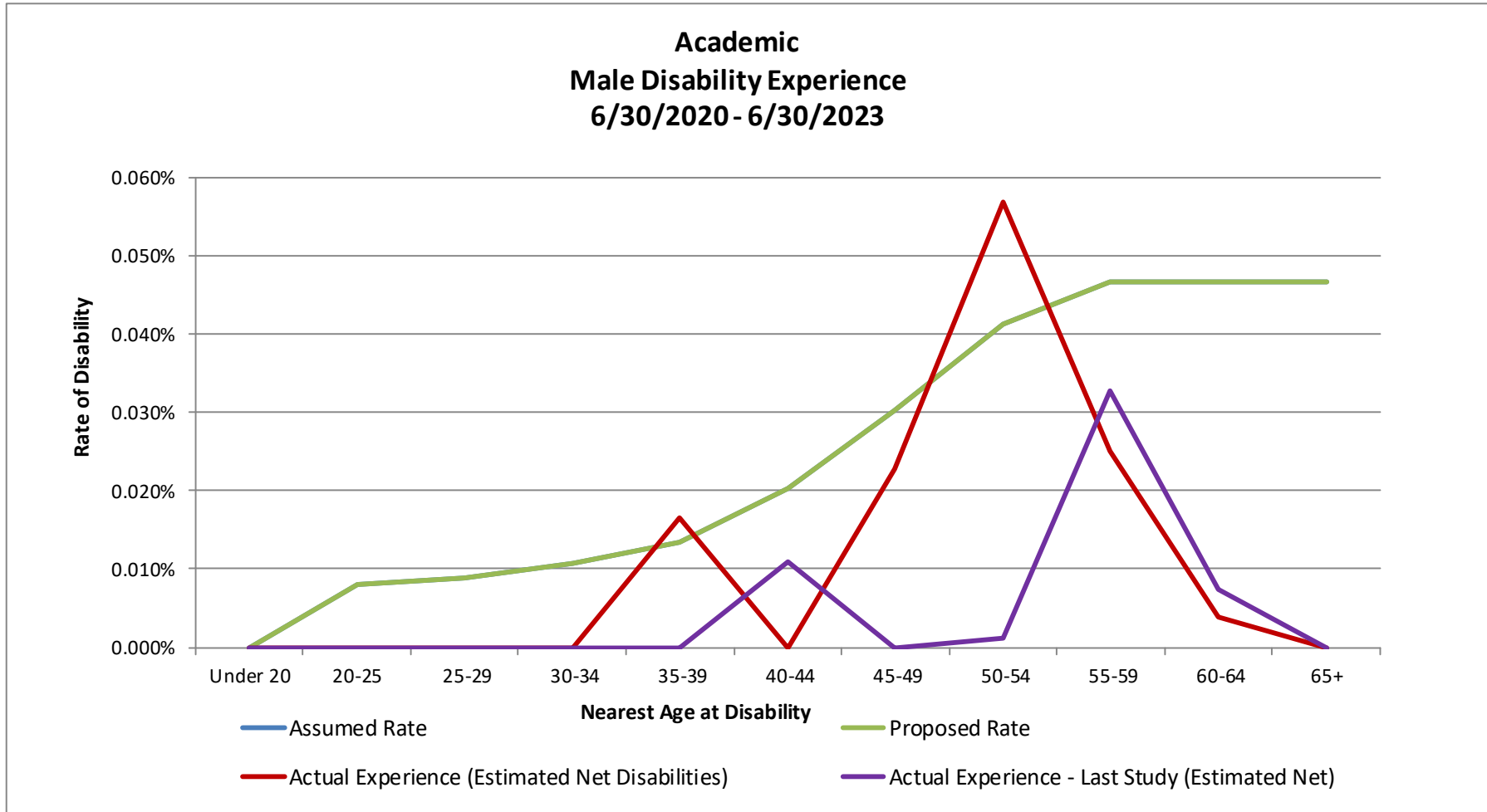
Current assumptions and proposed assumptions are based on liability weighting.

Actual to expected ratios for the proposed rates are based on estimated net disabilities (60% of actual disabilities).

Disability Assumption

Graph IV(a)

Academic
Male Disability Experience
6/30/2020 - 6/30/2023

Experience (Estimated Net Disabilities) is equal to 60% of actual disabilities.

Disability Assumption

Table IV(b)

Academic – Female

Age @ Disablement	Actual Experience								Current Assumptions - LW			Proposed Assumptions - LW		
	Population-Weighted			Liability-Weighted (LW)			Net Rates Weighted by		Expected Disabilities	Assumed Rate	Actual (Net)/ Expected	Expected Disabilities	Proposed Rate	Actual (Net)/ Expected
	Exposures	Disabilities	Net Disabilities	Exposures	Disabilities	Net Disabilities	Population	Liabilities						
Under 20	0	0	0	0	0	0			0			0		
20-25	38	0	0	2	0	0	0.0000%	0.0000%	0	0.0199%	0.0	0	0.0159%	0.0
25-29	438	0	0	37	0	0	0.0000%	0.0000%	0	0.0239%	0.0	0	0.0191%	0.0
30-34	1,732	0	0	339	0	0	0.0000%	0.0000%	0	0.0326%	0.0	0	0.0261%	0.0
35-39	3,454	1	1	1,795	0	0	0.0174%	0.0052%	1	0.0426%	0.1	1	0.0341%	0.2
40-44	4,423	1	1	5,061	1	1	0.0136%	0.0103%	3	0.0522%	0.2	2	0.0418%	0.2
45-49	4,634	1	1	9,522	8	5	0.0129%	0.0499%	6	0.0622%	0.8	5	0.0497%	1.0
50-54	4,597	1	1	13,517	13	8	0.0131%	0.0574%	10	0.0722%	0.8	8	0.0578%	1.0
55-59	4,331	4	2	17,078	12	7	0.0554%	0.0421%	13	0.0783%	0.5	11	0.0626%	0.7
60-64	3,652	1	1	15,704	4	3	0.0164%	0.0170%	12	0.0783%	0.2	10	0.0626%	0.3
65+	3,903	1	1	14,091	7	4	0.0154%	0.0310%	11	0.0782%	0.4	9	0.0626%	0.5
Totals:	31,202	10	6	77,146	46	27	0.0192%	0.0355%	56	0.0724%	0.5	45	0.0580%	0.6
Excluding 60+	23,647	8	5	47,351	34	20	0.0203%	0.0429%	33	0.0688+	0.6	26	0.0550%	0.8
Under 40	5,662	1	1	2,173	0	0	0.0106%	0.0043%	1	0.0407%	0.1	1	0.0325%	0.1
40-49	9,057	2	1	14,583	9	5	0.0132%	0.0361%	9	0.0587%	0.6	7	0.0470%	0.8
50-59	8,928	5	3	30,595	25	15	0.0336%	0.0489%	23	0.0756%	0.6	19	0.0605%	0.8
60+	7,555	2	1	29,795	12	7	0.0159%	0.0237%	23	0.0782%	0.3	19	0.0626%	0.4

Disability rates vary by age. Average rates for the five-year age bands are shown in the table above.

Current assumptions and proposed assumptions are based on liability weighting.

Actual to expected ratios for the proposed rates are based on estimated net disabilities (60% of actual disabilities).

Graph IV(b)

Academic
Female Disability Experience
6/30/2020 - 6/30/2023

Experience (Estimated Net Disabilities) is equal to 60% of actual disabilities.

Disability Assumption

Table IV(c)

Non-Academic – Male

Age @ Disablement	Actual Experience								Current Assumptions - LW			Proposed Assumptions - LW		
	Population-Weighted			Liability-Weighted (LW)			Net Rates Weighted by		Expected Disabilities	Assumed Rate	Actual (Net)/ Expected	Expected Disabilities	Proposed Rate	Actual (Net)/ Expected
	Exposures	Disabilities	Net Disabilities	Exposures	Disabilities	Net Disabilities	Population	Liabilities						
Under 20	1	0	0	0	0	0	0.0000%	0.0000%	0	0.0272%	0.0	0	0.0272%	0.0
20-25	497	0	0	25	0	0	0.0000%	0.0000%	0	0.0294%	0.0	0	0.0294%	0.0
25-29	2,704	0	0	300	0	0	0.0000%	0.0000%	0	0.0322%	0.0	0	0.0322%	0.0
30-34	4,714	3	2	1,210	1	0	0.0382%	0.0301%	0	0.0387%	0.8	0	0.0387%	0.8
35-39	5,323	5	3	3,862	7	4	0.0564%	0.1070%	2	0.0488%	2.2	2	0.0488%	2.2
40-44	5,283	3	2	7,631	2	1	0.0341%	0.0180%	6	0.0738%	0.2	6	0.0738%	0.2
45-49	5,184	5	3	11,126	3	2	0.0579%	0.0165%	12	0.1106%	0.1	12	0.1106%	0.1
50-54	5,692	17	10	16,932	50	30	0.1792%	0.1770%	25	0.1504%	1.2	25	0.1504%	1.2
55-59	5,090	13	8	17,074	33	20	0.1532%	0.1163%	29	0.1707%	0.7	29	0.1707%	0.7
60-64	3,883	17	10	12,820	39	24	0.2627%	0.1842%	22	0.1707%	1.1	22	0.1707%	1.1
65+	2,948	16	10	8,228	24	14	0.3256%	0.1748%	14	0.1707%	1.0	14	0.1707%	1.0
Totals:	**41,319**	**79**	**47**	**79,207**	**159**	**96**	**0.1147%**	**0.1206%**	**111**	**0.1401%**	**0.9**	**111**	**0.1401%**	**0.9**
Excluding 60+	**34,488**	**46**	**28**	**58,159**	**96**	**58**	**0.0800%**	**0.0989%**	**75**	**0.1290%**	**0.8**	**75**	**0.1290%**	**0.8**
Under 40	**13,239**	**8**	**5**	**5,397**	**7**	**4**	**0.0363%**	**0.0833%**	**2**	**0.0455%**	**1.8**	**2**	**0.0455%**	**1.8**
40-49	**10,467**	**8**	**5**	**18,757**	**5**	**3**	**0.0459%**	**0.0171%**	**18**	**0.0956%**	**0.2**	**18**	**0.0956%**	**0.2**
50-59	**10,782**	**30**	**18**	**34,006**	**83**	**50**	**0.1669%**	**0.1465%**	**55**	**0.1606%**	**0.9**	**55**	**0.1606%**	**0.9**
60+	**6,831**	**33**	**20**	**21,048**	**63**	**38**	**0.2899%**	**0.1805%**	**36**	**0.1707%**	**1.1**	**36**	**0.1707%**	**1.1**

Disability rates vary by age. Average rates for the five-year age bands are shown in the table above.
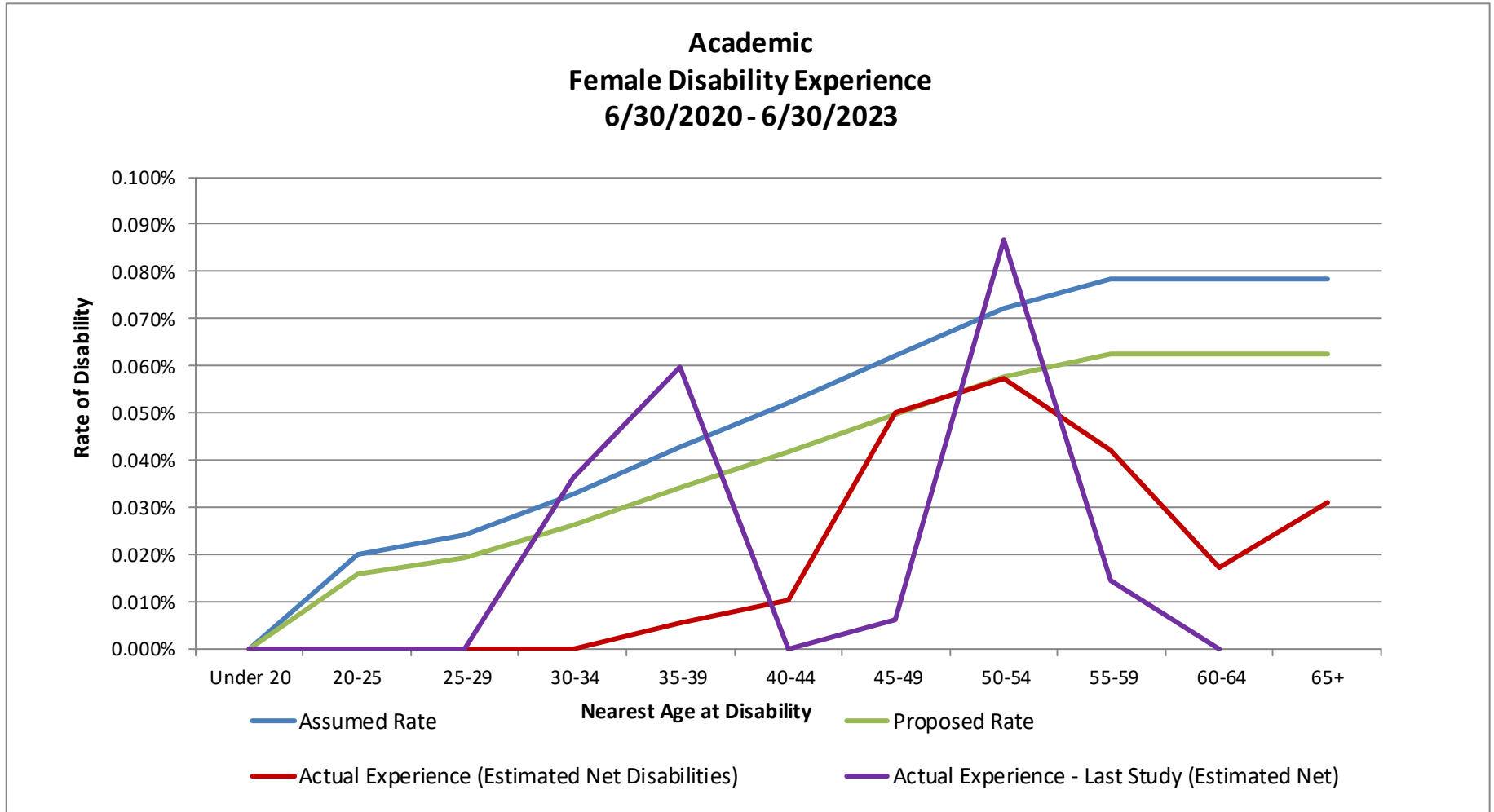
Current assumptions and proposed assumptions are based on liability weighting.

Actual to expected ratios for the proposed rates are based on estimated net disabilities (60% of actual disabilities).

Disability Assumption

Graph IV(c)

**Non-Academic
Male Disability Experience
6/30/2020 - 6/30/2023**

Experience (Estimated Net Disabilities) is equal to 60% of actual disabilities.

Disability Assumption

Table IV(d)

Non-Academic – Female

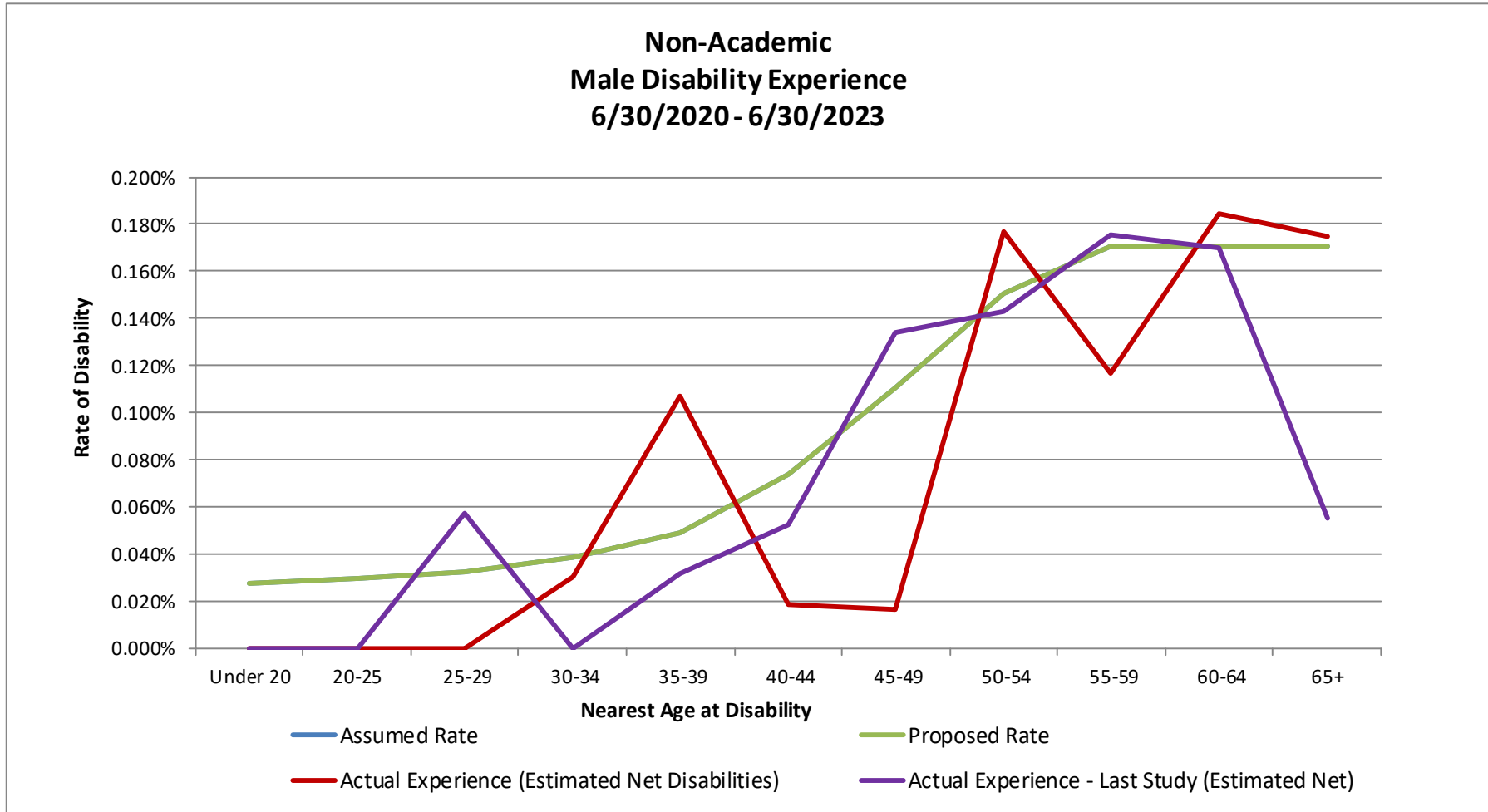| Age @ Disablement	Actual Experience								Current Assumptions - LW			Proposed Assumptions - LW		
	Population-Weighted			Liability-Weighted (LW)			Net Rates Weighted by		Expected Disabilities	Assumed Rate	Actual (Net)/ Expected	Expected Disabilities	Proposed Rate	Actual (Net)/ Expected
	Exposures	Disabilities	Net Disabilities	Exposures	Disabilities	Net Disabilities	Population	Liabilities						
Under 20	3	0	0	0	0	0	0.0000%	0.0000%	0	0.0377%	0.0	0	0.0361%	0.0
20-25	650	0	0	28	0	0	0.0000%	0.0000%	0	0.0450%	0.0	0	0.0431%	0.0
25-29	4,660	1	1	500	0	0	0.0129%	0.0465%	0	0.0547%	0.9	0	0.0523%	0.9
30-34	7,388	2	1	1,764	1	1	0.0162%	0.0324%	1	0.0737%	0.4	1	0.0705%	0.5
35-39	8,215	3	2	5,148	2	1	0.0219%	0.0190%	5	0.0971%	0.2	5	0.0928%	0.2
40-44	8,645	10	6	10,477	4	2	0.0694%	0.0206%	13	0.1195%	0.2	12	0.1143%	0.2
45-49	8,258	15	9	15,387	28	17	0.1090%	0.1083%	22	0.1430%	0.8	21	0.1368%	0.8
50-54	8,994	23	14	22,984	61	37	0.1534%	0.1589%	38	0.1665%	1.0	37	0.1592%	1.0
55-59	8,603	25	15	24,540	57	34	0.1744%	0.1397%	44	0.1800%	0.8	42	0.1722%	0.8
60-64	6,801	22	13	19,539	45	27	0.1941%	0.1380%	35	0.1800%	0.8	34	0.1722%	0.8
65+	4,392	14	8	12,109	26	16	0.1913%	0.1313%	22	0.1800%	0.7	21	0.1722%	0.8
Totals:	**66,609**	**115**	**69**	**112,475**	**224**	**134**	**0.1036%**	**0.1194%**	**180**	**0.1605%**	**0.7**	**173**	**0.1535%**	**0.8**
Excluding 60+	**55,416**	**79**	**47**	**80,828**	**152**	**91**	**0.0855%**	**0.1131%**	**124**	**0.1528%**	**0.7**	**118**	**0.1462%**	**0.8**
Under 40	**20,916**	**6**	**4**	**7,440**	**3**	**2**	**0.0172%**	**0.0239%**	**7**	**0.0885%**	**0.3**	**6**	**0.0846%**	**0.3**
40-49	**16,903**	**25**	**15**	**25,864**	**31**	**19**	**0.0887%**	**0.0728%**	**35**	**0.1335%**	**0.5**	**33**	**0.1277%**	**0.6**
50-59	**17,597**	**48**	**29**	**47,524**	**118**	**71**	**0.1637%**	**0.1490%**	**82**	**0.1734%**	**0.9**	**79**	**0.1659%**	**0.9**
60+	**11,193**	**36**	**22**	**31,648**	**71**	**43**	**0.1930%**	**0.1354%**	**57**	**0.1800%**	**0.8**	**54**	**0.1722%**	**0.8**

Disability rates vary by age. Average rates for the five-year age bands are shown in the table above.

Current assumptions and proposed assumptions are based on liability weighting.

Actual to expected ratios for the proposed rates are based on estimated net disabilities (60% of actual disabilities).

Disability Assumption

Graph IV(d)

Non-Academic
Female Disability Experience
6/30/2020 - 6/30/2023
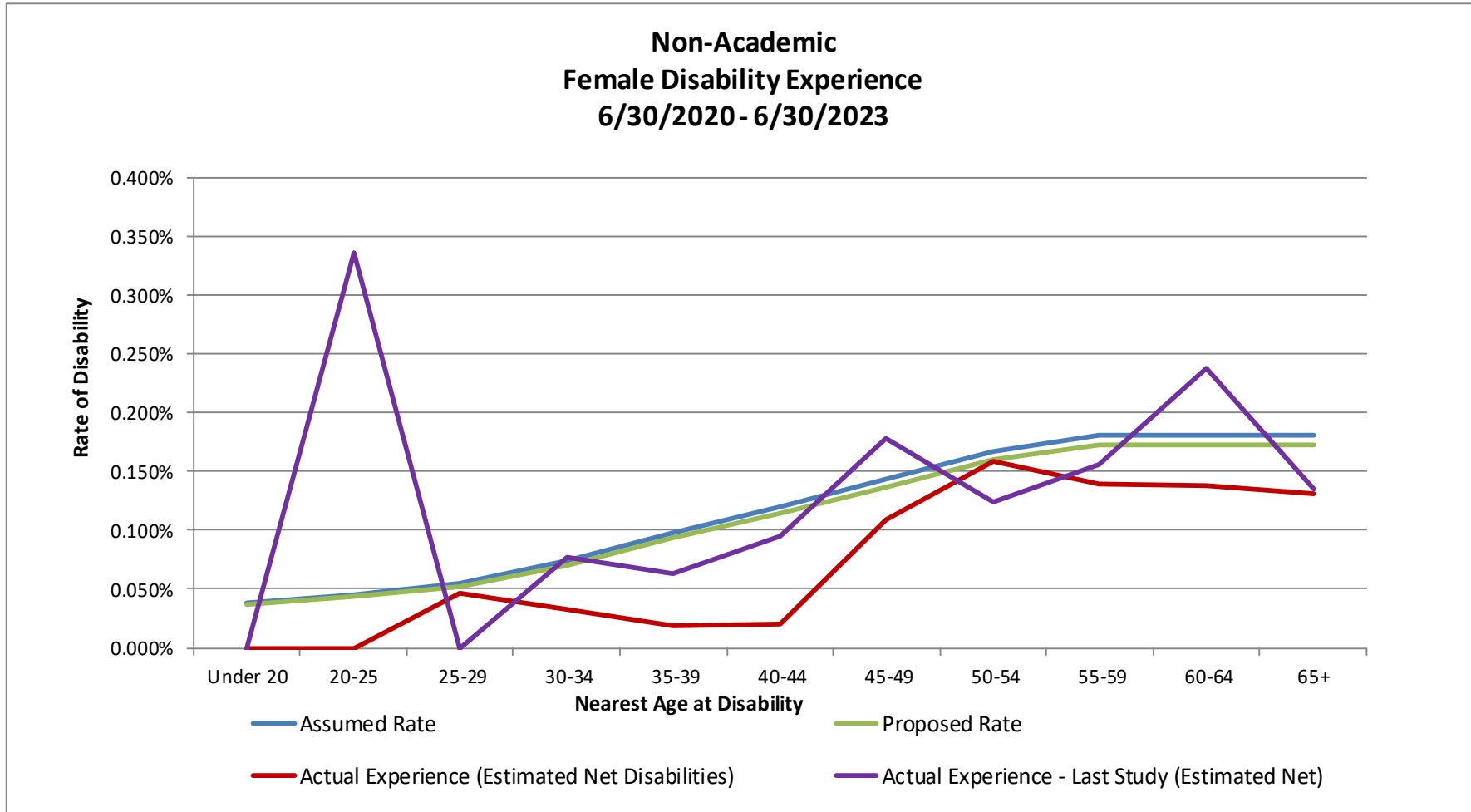
Experience (Estimated Net Disabilities) is equal to 60% of actual disabilities.

Mortality

Post-retirement mortality is an important component in cost calculations and should be updated from time to time to reflect current and expected future longevity improvements. Pre-retirement mortality is a relatively minor component in cost calculations. The frequency of pre-retirement deaths is so low that mortality assumptions based on actual experience can only be produced for very large retirement systems.

Actuarial Standards of Practice

Actuarial Standards of Practice (ASOP) No. 35 Disclosure Section 4.1.1 states, "The disclosure of the mortality assumption should contain sufficient detail to permit another qualified actuary to understand the provision made for future mortality improvement. If the actuary assumes zero mortality improvement after the measurement date, the actuary should state that no provision was made for future mortality improvement." The current mortality rates used in the valuation include a provision for future mortality improvement.

Experience Reviewed

We reviewed mortality experience separately for each year of the three-year experience study period (June 30, 2020 through June 30, 2023) and observed that mortality rates were higher in the year ending June 30, 2021 than the other two years of the experience study period and higher than each year from the last experience study (June 30, 2017, through June 30, 2020). In order to not have the impact of the COVID-19 pandemic skew the mortality experience, we excluded mortality experience for the year ending June 30, 2021, and used experience from the three-year period from the last experience study and the experience from June 30, 2021, through June 30, 2023, in recommending the mortality assumption to be used in the actuarial valuation.

Partial Credibility

We use what is termed "the limited fluctuation credibility procedure" to determine the appropriate scaling factor of the base mortality tables for each gender and each member classification. We used a liability-weighted basis for post-retirement non-disabled mortality, pre-retirement and post-retirement disabled mortality. In each case, the partial credibility factor (or "Z-factor") is computed based on the experience of the specific group being studied. This Z-factor is a measure of the credibility of the pertinent group.

The Best Fit is the ratio of actual to expected deaths using the base table. The final scale is then determined as the weighted average of the Best Fit and 100% based on the Z-factor. For example, the Z-factor for Academic Male Active Members is 17%, suggesting that the data for this group is 17% credible (there were not enough deaths among active members to be completely credible). The Best Fit for this group would be to scale the base tables by 94%. The final scale of 99% is the credibility-weighted average (99% = 17% x 94% + 83% x 100%). Factors for other groups are determined similarly. For Academic retired males, there were enough deaths (on a liability-weighted basis) to warrant full credibility on a lives basis. Therefore, the Best Fit is used as the final scale.

Mortality Assumptions

	Liability Needed For Full Credibility (Dollars in $100,000)	Observed Deaths	Z-Factor	Best Fit	Final Scale Factor
Academic					
Healthy Male Retirees	$10,976	$11,635	103%	96%	96%
Healthy Female Retirees	$8,831	$3,799	66%	105%	103%
Non-Academic					
Healthy Male Retirees	$7,451	$6,188	91%	102%	102%
Healthy Female Retirees	$5,591	$5,166	96%	104%	104%
Disabled Male Retirees	$4,879	$268	23%	195%	122%
Disabled Female Retirees	$4,408	$217	22%	126%	106%
Academic					
Male Active Members	$15,575	$466	17%	94%	99%
Female Active Members	$9,506	$201	15%	97%	100%
Non-Academic					
Male Active Members	$6,842	$513	27%	172%	120%
Female Active Members	$5,880	$304	23%	116%	104%

Healthy retiree, disabled and active member experience is based on liability amounts (liability amounts divided by 100,000). All experience is for the time period June 30, 2017, through June 30, 2020, and June 30, 2021, through June 30, 2023. Experience from June 30, 2020, through June 30, 2021, was excluded due to higher mortality during the year (attributable to COVID-19).

Recommendations

We reviewed the mortality experience separately for active members, service retirees and disabled members during the five-year study period (June 30, 2017, through June 30, 2020, and June 30, 2021, through June 30, 2023) and separately by employee type (academic vs. non-academic). Police officer mortality experience was excluded from the non-academic mortality experience. The results are shown on the following pages.

Due to the very small size of the police group, we have not summarized mortality experience for this group. We are recommending that the mortality assumption for the police group be based on 100% of the Pub-2010 mortality tables (for Public-Safety Employees).

Mortality Assumptions

Following is summary of the current and proposed mortality assumptions for members classified as an employee type of academic:

Academic Applicable Group	Base Table Mortality Table	Current Assumptions		Proposed Assumptions	
		Male Scaling Factor	Female Scaling Factor	Male Scaling Factor	Female Scaling Factor
Pre-retirement	Pub-2010 Employee Mortality Table (for Teachers)	101%	97%	99%	100%
Post-retirement (non-disabled)	Pub-2010 Healthy Retiree Mortality Table (for Teachers)	99%	105%	96%	103%
Post-retirement (disabled)	Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees)	112%	110%	122%	106%

Following is summary of the recommended mortality assumptions for members classified as an employee type of non-academic:

Non-Academic (non-Police) Applicable Group	Base Table Mortality Table	Current Assumptions		Proposed Assumptions	
		Male Scaling Factor	Female Scaling Factor	Male Scaling Factor	Female Scaling Factor
Pre-retirement	Pub-2010 Employee Mortality Table (for General Employees)	114%	105%	120%	104%
Post-retirement (non-disabled)	Pub-2010 Healthy Retiree Mortality Table (for General Employees)	99%	107%	102%	104%
Post-retirement (disabled)	Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees)	112%	110%	122%	106%

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the MP-2020 projection scale under the current assumptions and MP-2021 projection scale under the recommended assumptions.

Mortality Assumptions

Following is summary of the recommended mortality assumptions for members classified as an employee type of police:

Non-Academic (Police) Applicable Group	Current/Proposed Base Table Mortality Table	Current Assumptions		Proposed Assumptions	
		Male Scaling Factor	Female Scaling Factor	Male Scaling Factor	Female Scaling Factor
Pre-retirement	Current: Pub-2010 Employee Mortality Table (for General Employees) Proposed: Pub-2010 Employee Mortality Table (for Safety Employees)	114%	105%	100%	100%
Post-retirement (non-disabled)	Current: Pub-2010 Healthy Retiree Mortality Table (for General Employees) Proposed: Pub-2010 Healthy Retiree Mortality Table (for Safety Employees)	99%	107%	100%	100%
Post-retirement (disabled)	Current: Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees) Proposed: Pub-2010 Disabled Retiree Mortality Table (for Safety Employees)	112%	110%	100%	100%

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the MP-2020 projection scale under the current assumptions and MP-2021 projection scale under the recommended assumptions.

The following tables and graphs contain the mortality experience for the experience study period:

- Table and Graph V(a)(i) – Post-Retirement Mortality Experience – Academic
- Table and Graph V(a)(ii) – Post-Retirement Mortality Experience – Non-Academic
- Table and Graph V(b)(i) – Pre-Retirement Mortality Experience - Academic
- Table and Graph V(b)(ii) – Pre-Retirement Mortality Experience – Non-Academic
- Table and Graph V(c) – Disabled Mortality Experience – Combined Academic and Non-Academic

Mortality Assumptions

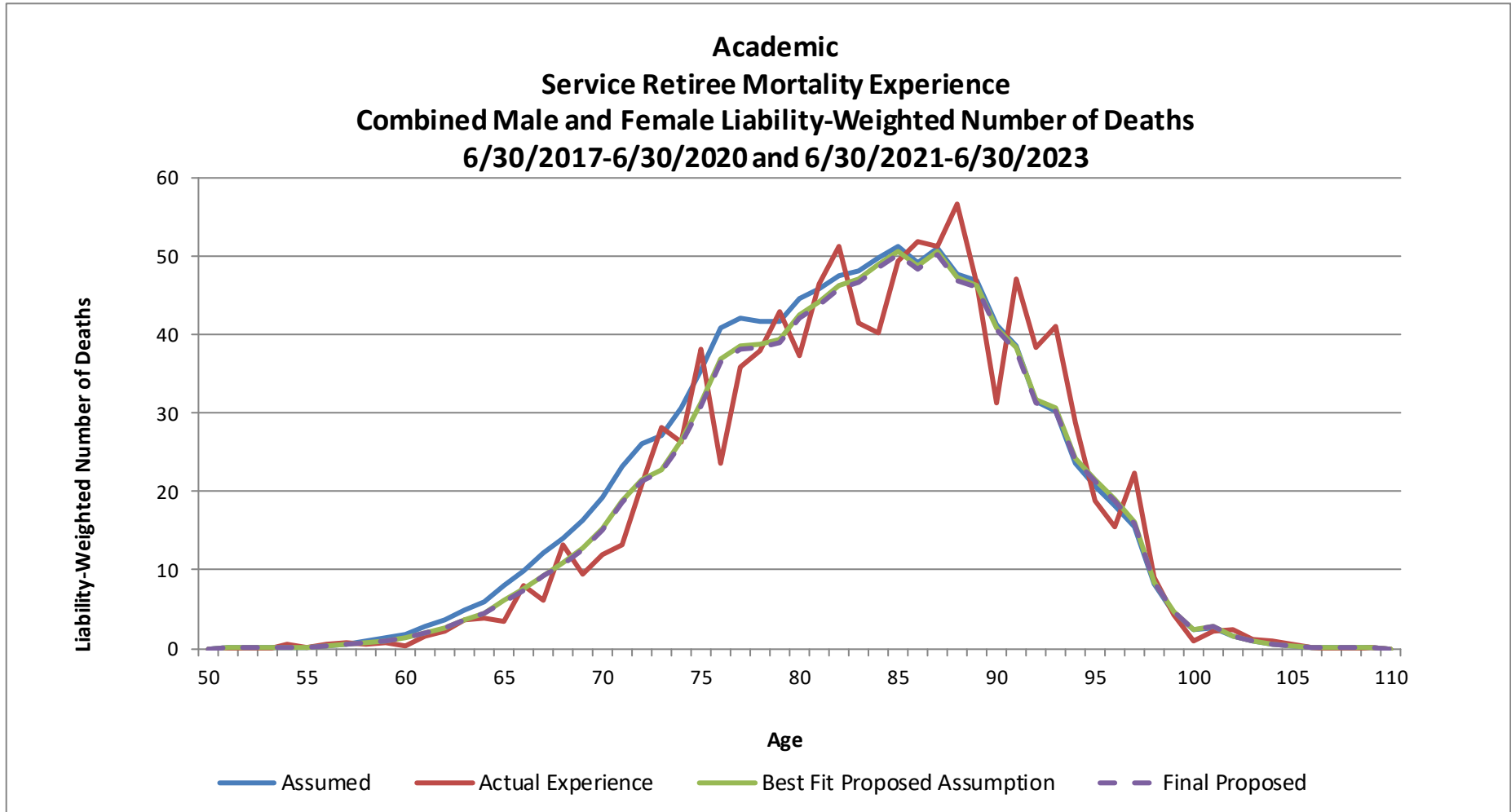## Academic – Post-Retirement Mortality (non-disabled)   Table V(a)(i)

	Actual Experience						Current Assumptions - LW			Best Fit Proposed Assumptions - LW			Final Proposed Assumptions - LW		
	Population-Weighted		Liability-Weighted (LW)		Actual Rates Weighted by										
Age	Exposures	Deaths	Exposures	Deaths	Population	Liability	Expected Deaths	Assumed Rate	Actual / Expected	Expected Deaths	Proposed Rate	Actual / Expected	Expected Deaths	Proposed Rate	Actual / Expected
Male Service Retiree Mortality Experience															
Under 50	50	0	658	0	0.000%	0.000%	1	0.160%	0.00	1	0.155%	0.00	1	0.155%	0.00
50-54	1,607	4	11,707	28	0.249%	0.236%	34	0.293%	0.81	33	0.283%	0.84	33	0.283%	0.84
55-59	5,653	33	44,763	194	0.584%	0.432%	210	0.469%	0.92	203	0.452%	0.96	203	0.452%	0.96
60-64	12,003	91	93,428	515	0.758%	0.552%	696	0.745%	0.74	672	0.719%	0.77	672	0.719%	0.77
65-69	16,070	198	121,475	1,461	1.232%	1.203%	1,555	1.280%	0.94	1,497	1.232%	0.98	1,497	1.232%	0.98
70-74	14,625	349	109,114	2,424	2.386%	2.221%	2,581	2.365%	0.94	2,482	2.275%	0.98	2,482	2.275%	0.98
75-79	10,158	470	65,002	2,745	4.627%	4.222%	2,894	4.451%	0.95	2,787	4.288%	0.98	2,787	4.288%	0.98
80-84	6,069	552	29,263	2,457	9.095%	8.395%	2,450	8.371%	1.00	2,364	8.078%	1.04	2,364	8.078%	1.04
85-89	2,518	419	8,458	1,422	16.640%	16.811%	1,245	14.717%	1.14	1,203	14.223%	1.18	1,203	14.223%	1.18
90-94	626	151	1,457	346	24.121%	23.759%	340	23.346%	1.02	329	22.596%	1.05	329	22.596%	1.05
95-99	59	23	97	41	38.983%	42.590%	32	32.476%	1.31	31	31.478%	1.35	31	31.478%	1.35
100+	2	2	2	2	100.000%	100.000%	1	40.749%	2.45	1	39.498%	2.53	1	39.498%	2.53
Totals:	**69,440**	**2,292**	**485,425**	**11,635**	**3.301%**	**2.397%**	**12,038**	**2.480%**	**0.97**	**11,603**	**2.390%**	**1.00**	**11,603**	**2.390%**	**1.00**
Female Service Retiree Mortality Experience															
Under 50	60	1	699	10	1.667%	1.457%	1	0.150%	9.72	1	0.146%	9.97	1	0.143%	10.17
50-54	2,037	6	12,327	35	0.295%	0.287%	33	0.265%	1.08	32	0.260%	1.10	31	0.255%	1.13
55-59	7,239	29	41,722	149	0.401%	0.358%	157	0.376%	0.95	155	0.373%	0.96	153	0.366%	0.98
60-64	14,122	76	75,137	392	0.538%	0.522%	407	0.541%	0.96	403	0.537%	0.97	396	0.526%	0.99
65-69	15,186	154	73,800	690	1.014%	0.935%	681	0.923%	1.01	672	0.911%	1.03	659	0.894%	1.05
70-74	10,835	184	49,496	857	1.698%	1.732%	882	1.782%	0.97	871	1.760%	0.98	854	1.726%	1.00
75-79	5,938	187	22,352	680	3.149%	3.042%	777	3.478%	0.87	769	3.442%	0.88	755	3.376%	0.90
80-84	2,964	202	7,647	542	6.815%	7.084%	511	6.685%	1.06	507	6.636%	1.07	498	6.509%	1.09
85-89	1,382	180	2,298	300	13.025%	13.063%	285	12.411%	1.05	284	12.344%	1.06	278	12.109%	1.08
90-94	423	105	504	126	24.823%	25.009%	103	20.502%	1.22	103	20.396%	1.23	101	20.007%	1.25
95-99	72	24	52	15	33.333%	28.616%	16	31.111%	0.92	16	31.015%	0.92	16	30.424%	0.94
100+	6	3	3	1	50.000%	46.039%	1	42.263%	1.09	1	42.186%	1.09	1	41.382%	1.11
Totals:	**60,264**	**1,151**	**286,036**	**3,799**	**1.910%**	**1.328%**	**3,855**	**1.348%**	**0.99**	**3,816**	**1.334%**	**1.00**	**3,743**	**1.309%**	**1.01**
Grand Totals:	**129,704**	**3,443**	**571,374**	**7,587**	**2.655%**	**1.328%**	**7,709**	**1.349%**	**0.98**	**7,630**	**1.335%**	**0.99**	**7,485**	**1.310%**	**1.01**

Expected deaths under the current and proposed assumptions are on a liability-weighted basis.

Graph V(a)(i)

Academic
Service Retiree Mortality Experience
Combined Male and Female Liability-Weighted Number of Deaths
6/30/2017-6/30/2020 and 6/30/2021-6/30/2023

Mortality Assumptions

Non-Academic – Post-Retirement Mortality (non-disabled)

Table V(a)(ii)

	Actual Experience						Current Assumptions - LW			Best Fit Proposed Assumptions - LW			Final Proposed Assumptions - LW		
	Population-Weighted		Liability-Weighted (LW)		Actual Rates Weighted by		Expected	Assumed	Actual /	Expected	Proposed	Actual /	Expected	Proposed	Actual /
Age	Exposures	Deaths	Exposures	Deaths	Population	Liability	Deaths	Rate	Expected	Deaths	Rate	Expected	Deaths	Rate	Expected
Under 50	328	0	3,277	0	0.000%	0.000%	11	0.348%	0.00	12	0.357%	0.00	12	0.357%	0.00
50-54	3,246	24	24,439	167	0.739%	0.682%	127	0.520%	1.31	130	0.533%	1.28	130	0.533%	1.28
55-59	7,886	76	55,664	426	0.964%	0.765%	419	0.754%	1.02	430	0.772%	0.99	430	0.772%	0.99
60-64	12,527	146	76,973	761	1.165%	0.989%	841	1.092%	0.91	862	1.120%	0.88	862	1.120%	0.88
65-69	12,528	259	65,945	1,346	2.067%	2.041%	1,140	1.729%	1.18	1,166	1.768%	1.15	1,166	1.768%	1.15
70-74	8,439	277	38,469	1,083	3.282%	2.815%	1,149	2.987%	0.94	1,174	3.053%	0.92	1,174	3.053%	0.92
75-79	5,225	313	18,790	996	5.990%	5.299%	1,018	5.417%	0.98	1,042	5.544%	0.96	1,042	5.544%	0.96
80-84	3,115	345	8,149	816	11.075%	10.011%	789	9.676%	1.03	808	9.920%	1.01	808	9.920%	1.01
85-89	1,324	247	2,643	473	18.656%	17.910%	421	15.927%	1.12	432	16.354%	1.10	432	16.354%	1.10
90-94	280	78	398	110	27.857%	27.701%	93	23.416%	1.18	96	24.078%	1.15	96	24.078%	1.15
95-99	30	11	31	10	36.667%	32.142%	10	32.432%	0.99	10	33.399%	0.96	10	33.399%	0.96
100+	0	0	0	0			0	#DIV/0!		0	#DIV/0!		0	#DIV/0!	
Totals:	**54,928**	**1,776**	**294,779**	**6,188**	**3.233%**	**2.099%**	**6,018**	**2.042%**	**1.03**	**6,163**	**2.091%**	**1.00**	**6,163**	**2.091%**	**1.00**

Female Service Retiree Mortality Experience

Age	Exposures	Deaths	Exposures	Deaths	Population	Liability	Deaths	Rate	Expected	Deaths	Rate	Expected	Deaths	Rate	Expected
Under 50	703	0	6,222	0	0.000%	0.000%	17	0.274%	0.00	16	0.261%	0.00	16	0.261%	0.00
50-54	6,189	17	40,023	103	0.275%	0.256%	149	0.373%	0.69	143	0.357%	0.72	143	0.357%	0.72
55-59	15,827	83	87,186	405	0.524%	0.465%	445	0.511%	0.91	430	0.493%	0.94	430	0.493%	0.94
60-64	24,151	173	110,213	728	0.716%	0.661%	842	0.764%	0.87	813	0.737%	0.90	813	0.737%	0.90
65-69	22,761	304	85,930	1,152	1.336%	1.340%	1,092	1.271%	1.05	1,051	1.223%	1.10	1,051	1.223%	1.10
70-74	15,582	378	45,880	1,047	2.426%	2.282%	1,048	2.283%	1.00	1,009	2.198%	1.04	1,009	2.198%	1.04
75-79	9,366	407	18,728	779	4.346%	4.158%	787	4.203%	0.99	758	4.050%	1.03	758	4.050%	1.03
80-84	5,128	400	7,093	501	7.800%	7.065%	565	7.966%	0.89	546	7.695%	0.92	546	7.695%	0.92
85-89	2,548	392	2,245	326	15.385%	14.500%	314	13.995%	1.04	304	13.537%	1.07	304	13.537%	1.07
90-94	838	198	446	108	23.628%	24.169%	97	21.651%	1.12	93	20.951%	1.15	93	20.951%	1.15
95-99	123	43	50	17	34.959%	34.076%	16	31.706%	1.07	16	30.736%	1.11	16	30.736%	1.11
100+	1	1	0	0	100.000%	100.000%	0	40.471%	2.47	0	39.267%	2.55	0	39.267%	2.55
Totals:	**103,217**	**2,396**	**404,017**	**5,166**	**2.321%**	**1.279%**	**5,373**	**1.330%**	**0.96**	**5,179**	**1.282%**	**1.00**	**5,179**	**1.282%**	**1.00**
Grand Totals:	**158,145**	**4,172**	**801,813**	**10,332**	**2.638%**	**1.289%**	**10,728**	**1.338%**	**0.96**	**10,341**	**1.290%**	**1.00**	**10,341**	**1.290%**	**1.00**

Expected deaths under the current and proposed assumptions are on a liability-weighted basis.

Mortality Assumptions

Graph V(a)(ii)

Non-Academic
Service Retiree Mortality Experience
Combined Male and Female Liability-Weighted Number of Deaths
6/30/2017-6/30/2020 and 6/30/2021-6/30/2023

Academic – Pre-Retirement Mortality   Table V(b)(i)

	Population-Weighted Exposures	Population-Weighted Deaths	Liability-Weighted (LW) Exposures	Liability-Weighted Deaths	Actual Rates Weighted by Population	Actual Rates Weighted by Liability	Current Assumptions - LW Expected Deaths	Current Assumptions - LW Assumed Rate	Current Assumptions - LW Actual / Expected	Best Fit Proposed Assumptions - LW Expected Deaths	Best Fit Proposed Assumptions - LW Proposed Rate	Best Fit Proposed Assumptions - LW Actual / Expected	Final Proposed Assumptions - LW Expected Deaths	Final Proposed Assumptions - LW Proposed Rate	Final Proposed Assumptions - LW Actual / Expected
Male Active Mortality Experience															
Under 30	793	0	57	0	0.000%	0.000%	0	0.026%	0.00	0	0.024%	0.00	0	0.025%	0.00
30-39	7,030	1	2,854	0	0.014%	0.011%	1	0.050%	0.21	1	0.046%	0.23	1	0.048%	0.22
40-49	12,142	14	20,213	19	0.115%	0.095%	16	0.077%	1.23	15	0.072%	1.32	15	0.076%	1.25
50-59	13,621	26	55,698	94	0.191%	0.169%	99	0.177%	0.95	91	0.164%	1.03	96	0.173%	0.98
60-69	11,092	34	60,379	133	0.307%	0.221%	248	0.411%	0.54	230	0.381%	0.58	242	0.402%	0.55
70-79	3,154	30	15,844	172	0.951%	1.085%	141	0.890%	1.22	130	0.821%	1.32	137	0.865%	1.25
Totals:	**47,832**	**105**	**155,045**	**419**	**0.220%**	**0.270%**	**505**	**0.326%**	**0.83**	**468**	**0.302%**	**0.90**	**493**	**0.318%**	**0.85**
Less than 60:	**33,586**	**41**	**78,822**	**114**	**0.122%**	**0.144%**	**116**	**0.147%**	**0.98**	**107**	**0.136%**	**1.06**	**113**	**0.143%**	**1.01**
Female Active Mortality Experience															
Under 30	1,038	0	78	0	0.000%	0.000%	0	0.014%	0.00	0	0.014%	0.00	0	0.015%	0.00
30-39	9,590	1	3,919	2	0.010%	0.044%	1	0.031%	1.43	1	0.030%	1.45	1	0.031%	1.40
40-49	15,350	8	23,140	3	0.052%	0.013%	11	0.049%	0.26	11	0.048%	0.26	12	0.050%	0.25
50-59	15,451	23	49,538	66	0.149%	0.133%	53	0.108%	1.23	52	0.106%	1.26	54	0.109%	1.22
60-69	10,824	28	39,889	101	0.259%	0.252%	92	0.232%	1.09	92	0.230%	1.10	95	0.237%	1.06
70-79	2,301	8	7,119	27	0.348%	0.384%	45	0.630%	0.61	44	0.622%	0.62	46	0.641%	0.60
Totals:	**54,554**	**68**	**123,684**	**198**	**0.125%**	**0.160%**	**203**	**0.164%**	**0.98**	**201**	**0.162%**	**0.99**	**207**	**0.167%**	**0.96**
Less than 60:	**41,429**	**32**	**76,676**	**70**	**0.077%**	**0.092%**	**66**	**0.086%**	**1.07**	**65**	**0.084%**	**1.09**	**67**	**0.087%**	**1.06**
Grand Totals:	**102,386**	**173**	**278,729**	**617**	**0.169%**	**0.221%**	**709**	**0.254%**	**0.87**	**668**	**0.240%**	**0.92**	**699**	**0.251%**	**0.88**
Less than 60:	**75,015**	**73**	**155,498**	**184**	**0.097%**	**0.118%**	**182**	**0.117%**	**1.01**	**172**	**0.111%**	**1.07**	**180**	**0.116%**	**1.02**

Expected deaths under the current and proposed assumptions are on a liability-weighted basis.

Graph V(b)(i)

Academic
Active Mortality Experience
Combined Male and Female Liability-Weighted Number of Deaths
6/30/2017-6/30/2020 and 6/30/2021-6/30/2023
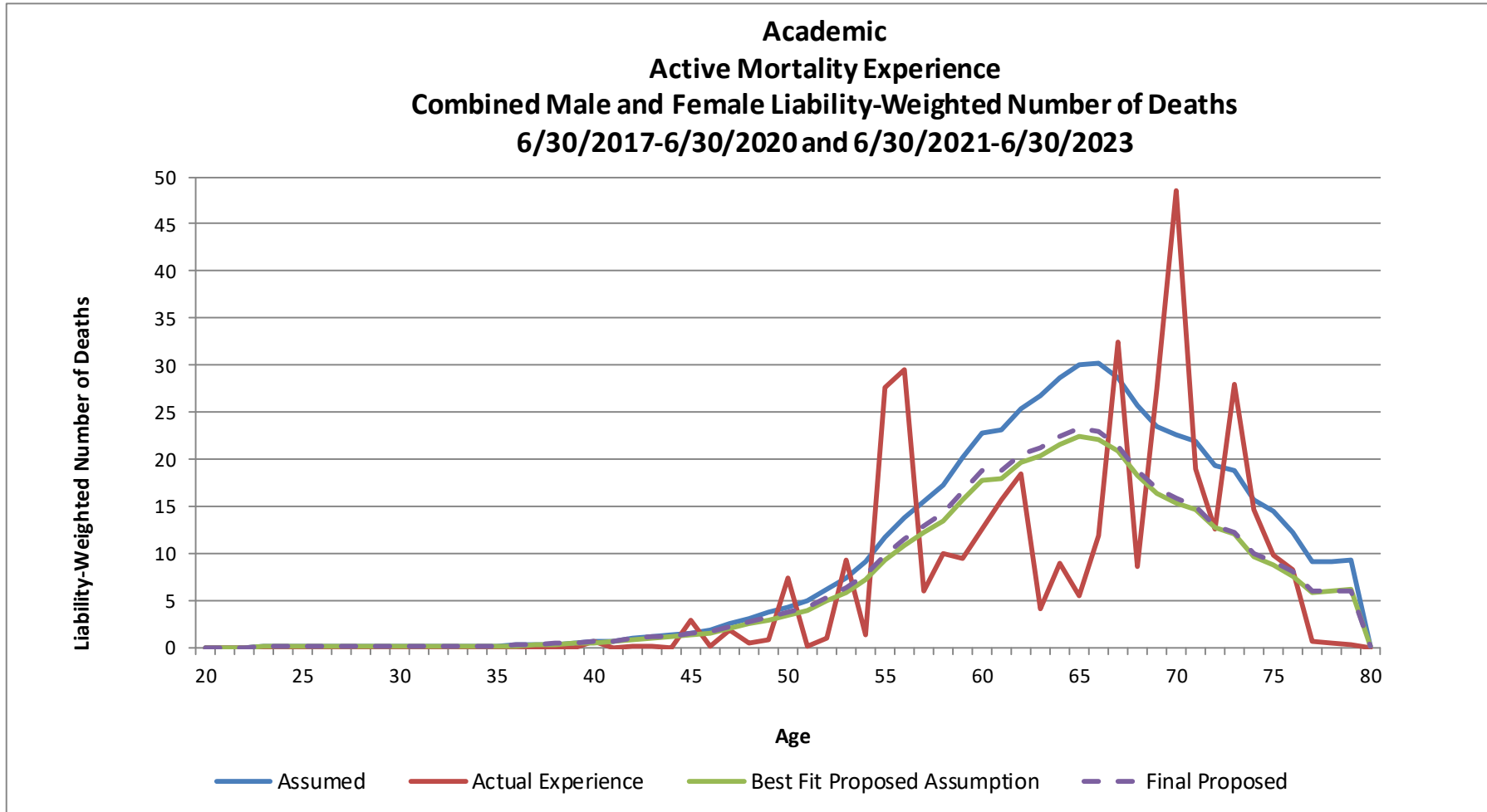
Mortality Assumptions

Non-Academic – Pre-Retirement Mortality   Table V(b)(ii)

	Male Active Mortality Experience														
	Actual Experience						Current Assumptions - LW			Best Fit Proposed Assumptions - LW			Final Proposed Assumptions - LW		
	Population-Weighted		Liability-Weighted (LW)		Actual Rates Weighted by		Expected	Assumed	Actual /	Expected	Proposed	Actual /	Expected	Proposed	Actual /
Age	Exposures	Deaths	Exposures	Deaths	Population	Liability	Deaths	Rate	Expected	Deaths	Rate	Expected	Deaths	Rate	Expected
Under 30	6,241	5	534	1	0.080%	0.100%	0	0.047%	2.13	0	0.069%	1.44	0	0.048%	2.07
30-39	17,589	10	7,699	6	0.057%	0.074%	6	0.080%	0.92	9	0.120%	0.62	6	0.084%	0.88
40-49	17,422	29	27,164	50	0.166%	0.183%	33	0.121%	1.51	50	0.183%	1.00	35	0.128%	1.43
50-59	18,026	63	52,248	176	0.349%	0.336%	128	0.245%	1.37	192	0.368%	0.91	134	0.257%	1.31
60-69	9,811	64	28,980	178	0.652%	0.613%	141	0.487%	1.26	212	0.731%	0.84	148	0.510%	1.20
70-79	1,460	21	3,518	104	1.438%	2.957%	33	0.952%	3.11	50	1.426%	2.07	35	0.995%	2.97
Totals:	70,549	192	120,144	513	0.272%	0.427%	342	0.285%	1.50	514	0.427%	1.00	358	0.298%	1.43
Less than 60:	59,278	107	87,646	232	0.181%	0.264%	167	0.191%	1.38	252	0.287%	0.92	176	0.200%	1.32
	Female Active Mortality Experience														
	Population-Weighted		Liability-Weighted		Actual Rates Weighted by		Expected	Assumed	Actual /	Expected	Proposed	Actual /	Expected	Proposed	Actual /
Age	Exposures	Deaths	Exposures	Deaths	Population	Liability	Deaths	Rate	Expected	Deaths	Rate	Expected	Deaths	Rate	Expected
Under 30	10,572	1	891	0	0.009%	0.003%	0	0.016%	0.19	0	0.017%	0.17	0	0.015%	0.19
30-39	27,335	5	11,317	4	0.018%	0.040%	4	0.035%	1.14	4	0.038%	1.04	4	0.034%	1.16
40-49	28,543	18	39,740	24	0.063%	0.060%	24	0.060%	1.01	26	0.065%	0.92	23	0.059%	1.03
50-59	31,001	43	77,076	98	0.139%	0.127%	102	0.133%	0.96	111	0.144%	0.88	100	0.129%	0.99
60-69	16,773	50	44,104	128	0.298%	0.290%	119	0.269%	1.08	130	0.295%	0.98	117	0.265%	1.10
70-79	1,950	15	4,710	49	0.769%	1.046%	29	0.609%	1.72	31	0.666%	1.57	28	0.597%	1.75
Totals:	116,174	132	177,839	304	0.114%	0.171%	277	0.156%	1.10	303	0.170%	1.00	272	0.153%	1.12
Less than 60:	97,451	67	129,024	127	0.069%	0.098%	130	0.101%	0.97	141	0.110%	0.90	127	0.098%	1.00
Grand Totals:	186,723	324	297,983	817	0.174%	0.274%	619	0.208%	1.32	817	0.274%	1.00	630	0.211%	1.30
Less than 60:	156,729	174	216,670	358	0.111%	0.165%	298	0.137%	1.20	393	0.181%	0.91	302	0.140%	1.18

Expected deaths under the current and proposed assumptions are on a liability-weighted basis.

Mortality Assumptions

Graph V(b)(ii)

Non-Academic
Active Mortality Experience
Combined Male and Female Liability-Weighted Number of Deaths
6/30/2017-6/30/2020 and 6/30/2021-6/30/2023

Legend: Assumed — Actual Experience — Best Fit Proposed Assumption — Final Proposed

Y-axis: Liability-Weighted Number of Deaths

X-axis: Age
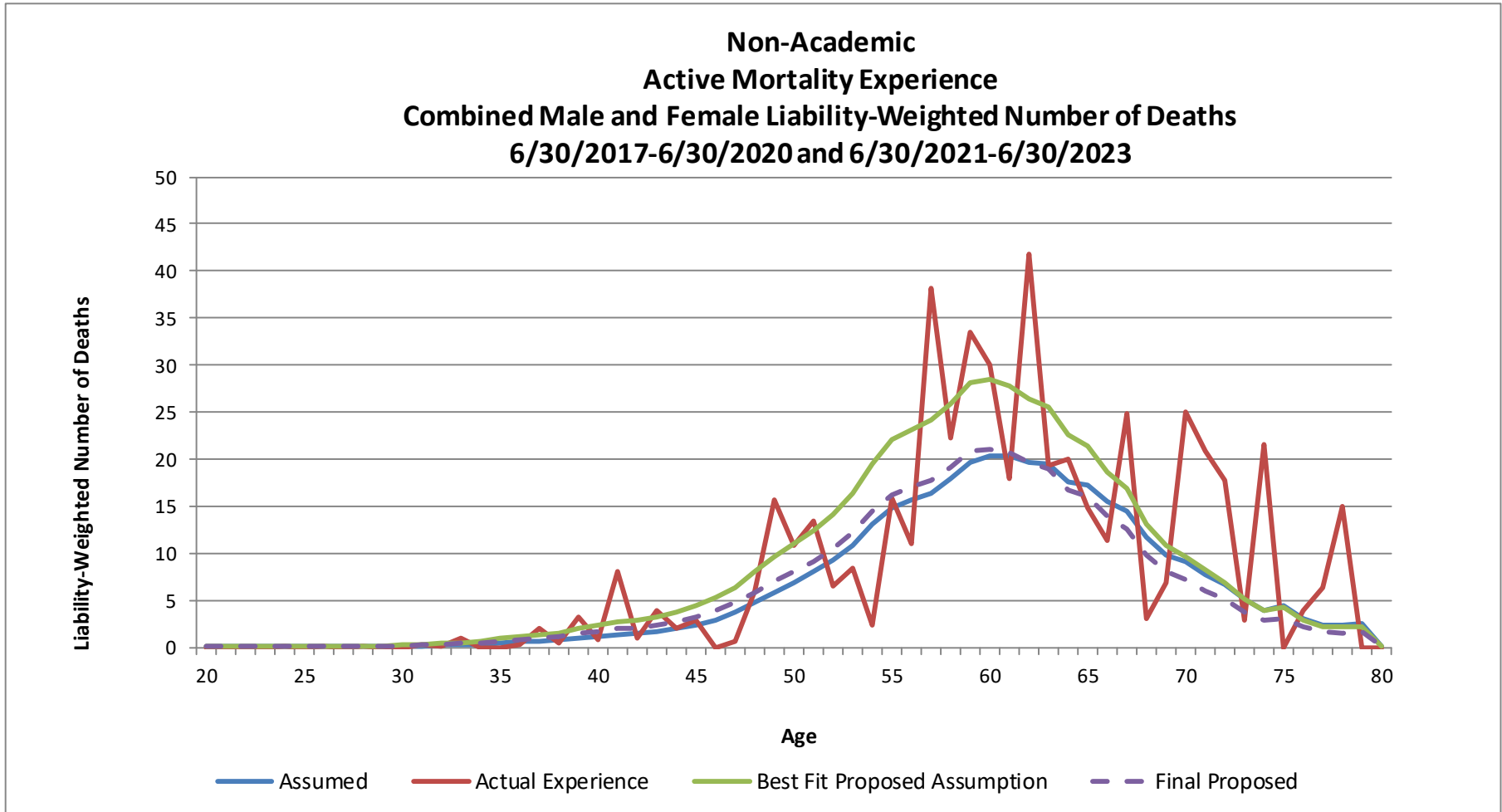
Mortality Assumptions

Combined Academic and Non-Academic – Post-Retirement Mortality (disabled)   Table V(c)

		Actual Experience					Current Assumptions - LW			Best Fit Proposed Assumptions - LW			Final Proposed Assumptions - LW		
		Population-Weighted		Liability-Weighted (LW)		Actual Rates Weighted by		Expected	Assumed	Actual /	Expected	Proposed	Actual /	Expected	Proposed	Actual /
Age		Exposures	Deaths	Exposures	Deaths	Population	Liability	Deaths	Rate	Expected	Deaths	Rate	Expected	Deaths	Rate	Expected
Male Disabled Retiree Mortality Experience																
25-29		3	0	9	0	0.349%	0.000%	0	0.473%	0.00	0	0.803%	0.00	0	0.503%	0.00
30-34		8	1	29	8	1.645%	26.848%	0	0.655%	40.96	0	1.120%	23.97	0	0.701%	38.31
35-39		25	0	86	0	1.759%	0.000%	1	0.820%	0.00	1	1.417%	0.00	1	0.887%	0.00
40-44		60	1	211	4	2.472%	1.822%	2	1.003%	1.82	4	1.752%	1.04	2	1.096%	1.66
45-49		106	3	336	12	2.584%	3.483%	5	1.371%	2.54	8	2.394%	1.45	5	1.498%	2.33
50-54		172	5	656	16	3.670%	2.386%	13	1.967%	1.21	22	3.410%	0.70	14	2.133%	1.12
55-59		311	14	1,152	55	3.534%	4.759%	30	2.569%	1.85	51	4.449%	1.07	32	2.783%	1.71
60-64		446	21	1,470	59	3.577%	4.044%	39	2.653%	1.52	68	4.595%	0.88	42	2.875%	1.41
65-69		276	18	750	49	5.772%	6.556%	31	4.199%	1.56	55	7.275%	0.90	34	4.552%	1.44
70-74		131	14	295	23	7.386%	7.791%	17	5.796%	1.34	30	10.021%	0.78	18	6.270%	1.24
75-79		66	8	155	18	11.420%	11.715%	9	5.950%	1.97	16	10.277%	1.14	10	6.430%	1.82
80-84		27	9	61	22	14.950%	37.009%	8	12.540%	2.95	13	21.688%	1.71	8	13.569%	2.73
Other		17	1	20	2	5.075%	11.281%	0	2.341%	4.82	1	4.042%	2.79	0	2.529%	4.46
Totals:		**1,648**	**95**	**5,228**	**268**	**4.618%**	**5.130%**	**155**	**2.965%**	**1.73**	**268**	**5.135%**	**1.00**	**168**	**3.213%**	**1.60**
Female Disabled Retiree Mortality Experience																
25-29		2	0	8	0	0.456%	0.000%	0	0.263%	0.00	0	0.294%	0.00	0	0.247%	0.00
30-34		20	0	64	0	0.708%	0.000%	0	0.498%	0.00	0	0.560%	0.00	0	0.471%	0.00
35-39		57	2	191	7	1.105%	3.918%	1	0.681%	5.75	1	0.770%	5.09	1	0.648%	6.05
40-44		132	2	515	3	1.172%	0.673%	5	0.899%	0.75	5	1.017%	0.66	4	0.856%	0.79
45-49		203	1	736	6	1.869%	0.806%	9	1.257%	0.64	10	1.421%	0.57	9	1.195%	0.67
50-54		360	11	1,364	33	2.259%	2.445%	24	1.739%	1.41	27	1.954%	1.25	22	1.644%	1.49
55-59		634	11	2,010	32	2.820%	1.570%	43	2.131%	0.74	48	2.402%	0.65	41	2.021%	0.78
60-64		832	23	2,440	63	2.681%	2.586%	47	1.930%	1.34	54	2.194%	1.18	45	1.845%	1.40
65-69		526	19	1,190	40	3.681%	3.391%	36	3.027%	1.12	41	3.444%	0.98	34	2.898%	1.17
70-74		212	11	374	19	4.756%	5.092%	15	4.066%	1.25	17	4.612%	1.10	15	3.880%	1.31
75-79		109	5	127	4	7.888%	3.424%	7	5.428%	0.63	8	6.157%	0.56	7	5.180%	0.66
80-84		55	7	47	6	11.161%	12.883%	5	9.604%	1.34	5	10.905%	1.18	4	9.174%	1.40
Other		31	4	18	2	5.627%	13.779%	1	3.803%	3.62	1	4.310%	3.20	1	3.626%	3.80
Totals:		**3,173**	**96**	**9,082**	**217**	**3.163%**	**2.391%**	**192**	**2.119%**	**1.13**	**218**	**2.400%**	**1.00**	**183**	**2.019%**	**1.18**
Grand Totals:		**4,821**	**191**	**14,310**	**485**	**3.660%**	**3.392%**	**347**	**2.428%**	**1.40**	**486**	**3.399%**	**1.00**	**351**	**2.455%**	**1.38**

Expected deaths under the current and proposed assumptions are on a liability-weighted basis.

Graph V(c)

Combined Academic and Non-Academic
Disabled Retiree Mortality Experience
Combined Male and Female Liability-Weighted Number of Deaths
6/30/2017-6/30/2020 and 6/30/2021-6/30/2023
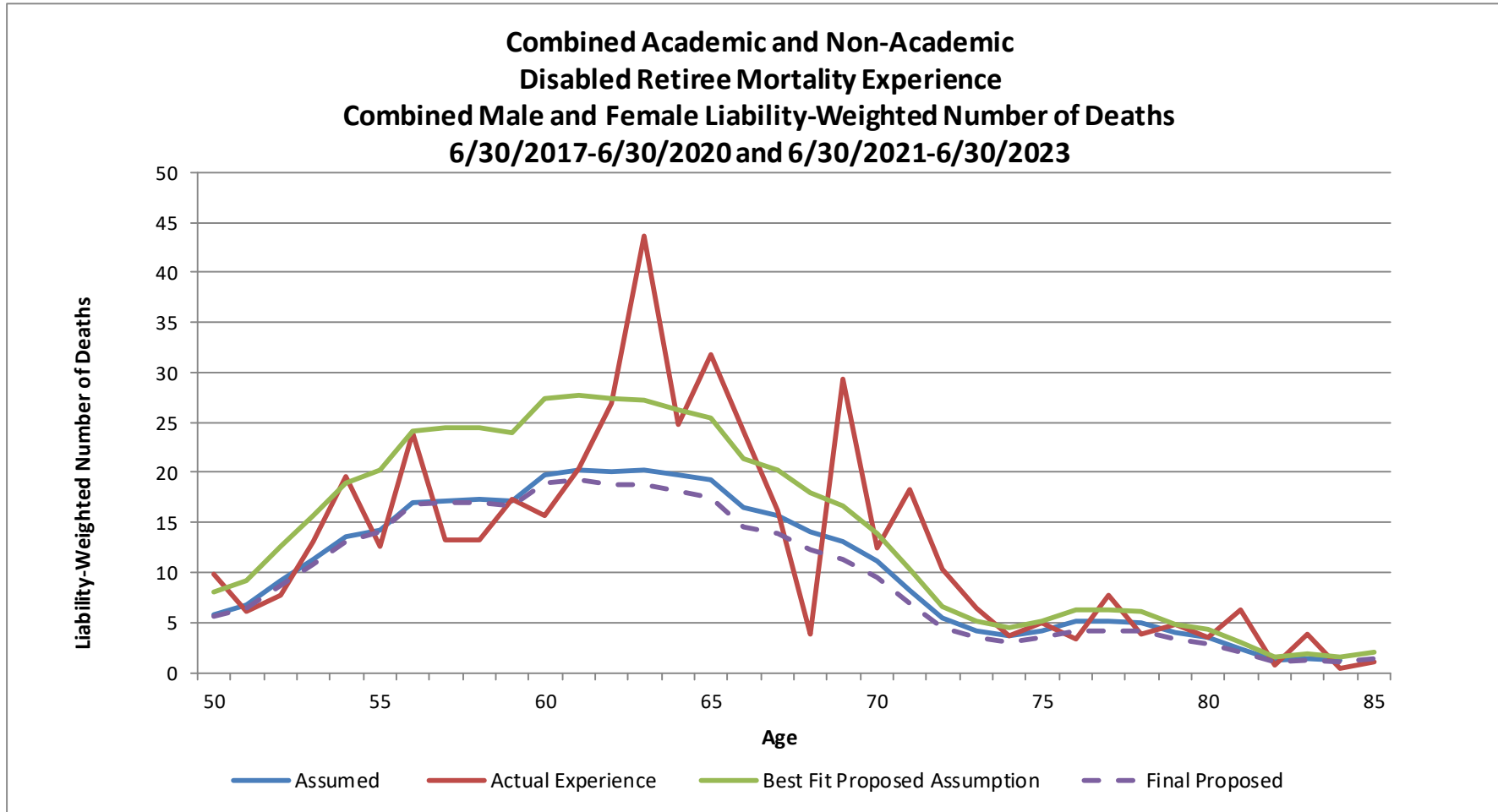
Other Valuation Assumptions

Plan Election Percentage

Historically, members have been able to elect to participate in one of the two defined benefit plans, the Traditional Plan and the Portable Plan, or a defined contribution plan, the Retirement Savings Plan (RSP), which prior to September 1, 2020, was called the Self-Managed Plan (SMP).

Below is a summary of the election percentage for the RSP over the current and prior experience study period for all new members. The RSP election rate has been increasing since the implementation of Tier 2. In addition, the RSP election rate by payroll is higher than the RSP election rate by member count. This means that higher paid members are electing RSP in higher rates than lower paid members.

Fiscal Year End	RSP Election	Total	RSP % of Total	RSP Payroll	Total Payroll	RSP % of Total
2011	576	4,999	12%	$26,313,040	$158,945,724	17%
2012	905	5,980	15%	49,647,414	219,476,815	23%
2013	1,182	6,490	18%	63,653,331	226,530,240	28%
2014	1,206	6,062	20%	61,439,095	198,297,074	31%
2011-2014	**3,869**	**23,531**	**16%**	**201,052,880**	**803,249,854**	**25%**
2015	1,104	6,112	18%	63,337,720	213,701,866	30%
2016	906	5,019	18%	52,500,782	180,444,525	29%
2017	907	4,894	19%	50,705,974	176,714,628	29%
2015-2017	**2,917**	**16,025**	**18%**	**166,544,476**	**570,861,019**	**29%**
2018	1,082	5,563	19%	58,726,642	200,290,628	29%
2019	1,206	6,483	19%	65,619,059	237,130,015	28%
2020	1,279	6,440	20%	83,833,790	263,480,540	32%
2018-2020	**3,567**	**18,486**	**19%**	**208,179,491**	**700,901,183**	**30%**
2015-2020	**6,484**	**34,511**	**19%**	**374,723,967**	**1,271,762,203**	**29%**
Total	**10,353**	**58,042**	**18%**	**575,776,847**	**2,075,012,056**	**28%**

Below is a summary of the election percentage for the RSP over the experience study period for new members with salaries greater than or equal to $100,000.

Fiscal Year End	RSP Election	Total	RSP % of Total
2011	49	146	34%
2012	90	204	44%
2013	112	188	60%
2014	125	177	71%
2011-2014	**376**	**715**	**53%**
2015	126	204	62%
2016	112	186	60%
2017	103	184	56%
2015-2017	**341**	**574**	**59%**
2018	112	189	59%
2019	132	233	57%
2020	207	295	70%
2018-2020	**451**	**717**	**63%**
2015-2020	**792**	**1,291**	**61%**
Total	**1,168**	**2,006**	**58%**

Other Valuation Assumptions

Below is a summary of the election percentage for the RSP over the experience study period for new Tier 2 members shown separately for Academic and Non-Academic member classifications.

Fiscal Year End	RSP Election	Total	RSP % of Total	RSP Payroll	Total Payroll	RSP % of Total
Academic						
2018	293	1,010	29%	$ 23,262,613	$ 53,407,543	44%
2019	348	1,151	30%	27,129,037	62,541,124	43%
2020	350	1,133	31%	29,262,190	62,737,682	47%
2018-2020	**991**	**3,294**	**30%**	**$ 79,653,840**	**$ 178,686,350**	**45%**
2021	255	847	30%	$ 24,822,711	$ 52,841,230	47%
2022	237	962	25%	20,421,717	50,127,431	41%
2023	269	1,279	21%	25,398,158	69,623,924	36%
2021-2023	**761**	**3,088**	**25%**	**$ 70,642,587**	**$ 172,592,585**	**41%**
2018-2023	**1,752**	**6,382**	**27%**	**$ 150,296,427**	**$ 351,278,935**	**43%**
Non-Academic						
2018	722	4,029	18%	$ 32,695,185	$ 129,188,942	25%
2019	791	4,715	17%	35,930,155	153,238,612	23%
2020	879	4,800	18%	52,056,369	182,377,957	29%
2018-2020	**2,392**	**13,544**	**18%**	**$ 120,681,709**	**$ 464,805,511**	**26%**
2021	569	3,462	16%	$ 33,541,966	$ 134,109,640	25%
2022	735	5,096	14%	40,152,275	185,745,010	22%
2023	786	5,724	14%	46,932,490	218,971,980	21%
2021-2023	**2,090**	**14,282**	**15%**	**$ 120,626,731**	**$ 538,826,630**	**22%**
2018-2023	**4,482**	**27,826**	**16%**	**$ 241,308,440**	**$ 1,003,632,141**	**24%**
Grand Total	**6,234**	**34,208**	**18%**	**$ 391,604,867**	**$ 1,354,911,076**	**29%**

Totals for 2018-2020 differ from prior page due to only including Tier 2 members. Certain members who are new actives may be eligible to participate in Tier 1.

We recommend using the following assumptions for plan elections, which are different for Academic and Non-Academic member classifications.

Plan Election Assumptions for Future New Hires				
	Current		Proposed	
	Academic	Non-Academic	Academic	Non-Academic
Retirement Savings Plan (RSP)	45%	25%	45%	25%
Tier 2 Plan	55%	75%	55%	75%

Other Valuation Assumptions

Money Purchase Factors

The money purchase factors, which apply by statute to Rule 2 benefit calculations, are to be updated each time there is a change in the investment return assumption or the post-retirement mortality assumption. The current money purchase factors are based on an investment return assumption of 6.50% and a mortality assumption based on the Pub-2010 Healthy Retiree Mortality Table (for Teachers).

Based on the recommendations in this experience study, GRS is recommending a change in the post-retirement mortality assumption to be first effective with the next valuation as of June 30, 2024. In the past when the factors have changed, the Board has adopted an effective date for implementation of the new money purchase factors. These factors will apply only to members hired before July 1, 2005, who are eligible for the money purchase benefit formula.

Following is the language from the Illinois Pension Code regarding actuarial assumptions used for benefit administration, including the calculation of money purchase factors.

> (40 ILCS 5/15-124) (from Ch. 108 1/2, par. 15-124)
> Sec. 15-124. Actuarial tables.
> "Actuarial tables": Such tabular listings of assumed rates of decrement such as death, disability, retirement and withdrawal from service, according to age and sex, including mathematical functions derived from the rates of probability, combined with an interest discount factor, as are adopted by the board based upon the experience of the system.

For actuarial valuation purposes, GRS is recommending separate mortality rates for members for Academic and non-Academic employment types. However, for purposes of money purchase factors and other administrative purposes, we would recommend a combined mortality assumption that applies to all SURS members. The table below summarizes the separate assumptions recommended for actuarial valuation purposes and the combined mortality assumption recommended for administrative purposes. The money purchase factors are based on a unisex blend of 45% of the male rates and 55% of the female rates. There are other reasonable methods that could be used for a single mortality assumption for the money purchase factors other than the assumption shown in the table below, such as calculating separate money purchase factors based on Academic mortality and Non-Academic mortality and then blending the separate sets of money purchase factors.

Post-retirement (non-disabled) for Applicable Group	Base Table Mortality Table	Male Scaling Factor	Female Scaling Factor
Academic	Pub-2010 Healthy Retiree Mortality Table (for Teachers)	96%	103%
Non-Academic	Pub-2010 Healthy Retiree Mortality Table (for General Employees)	102%	104%
Combined Academic and Non-Academic	Pub-2010 Healthy Retiree Mortality Table (for General Employees)	90%	95%

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the MP-2021 projection scale.

Other Valuation Assumptions

Following is a graph illustrating the impact of the change in a member's benefit as a result to the change in the money purchase factors based on the proposed assumptions.

The money purchase benefit is calculated such that the money purchase balance is sufficient to pay benefits for the assumed lifetime of the retiree based on assumed future investment earnings.

SURS Money Purchase Factors
Percentage Change in Money Purchase Benefit Due to Change in Factors
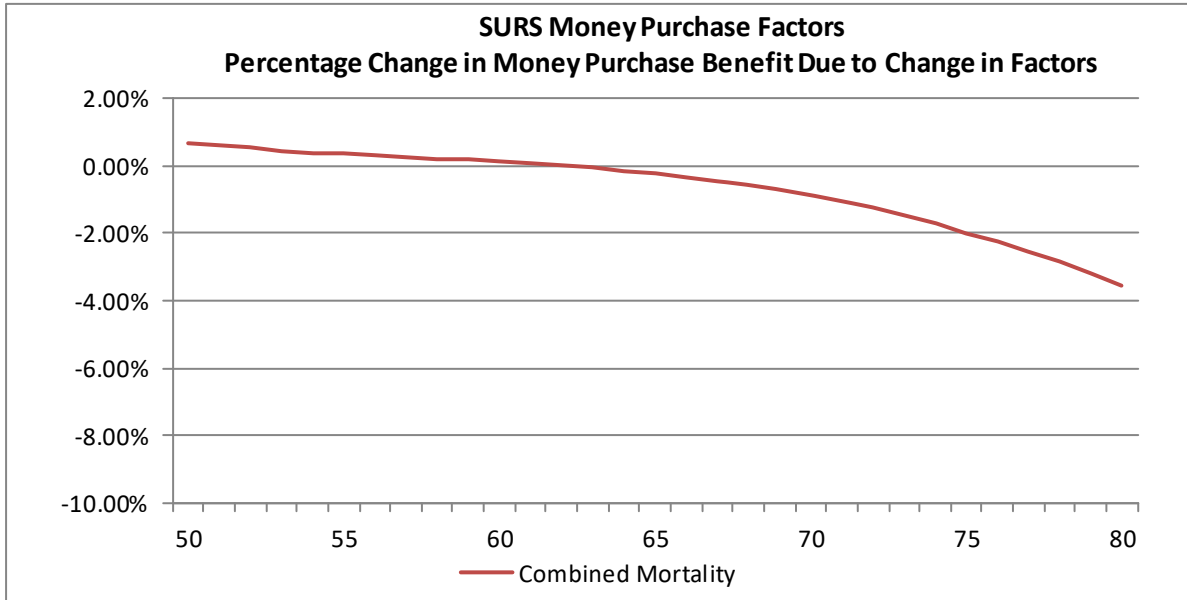
Following is a table summarizing the money purchase benefit under the current factors and the factors using the proposed assumptions. In addition, the table shows the benefit under each set of factors if the member continued working for one additional year and retired with a higher money purchase balance. Although a member may have a lower benefit under the updated money purchase factors, a member would still accrue a higher benefit by working one additional year compared to retiring immediately before the change in the money purchase factors.

Immediate Monthly Benefit			Monthly Benefit 1 Year Later			Inc in Monthly Benefit 1 Year	
Age	Current	Proposed	Age	Current	Proposed	Current to Current	Current to Proposed
55	$1,211	$1,215	56	$1,382	$1,386	$171	$175
60	$1,288	$1,289	61	$1,475	$1,476	$187	$188
65	$1,399	$1,395	66	$1,611	$1,606	$212	$207
70	$1,568	$1,554	71	$1,820	$1,801	$252	$232
75	$1,834	$1,797	76	$2,149	$2,100	$315	$266

In addition, a member eligible for the money purchase formula will receive the greater of the money purchase formula benefit and the general formula benefit. Therefore, not all money purchase eligible members will be affected and the impact for a member may be less than the example shown above. The proposed annuity factors are based on member ages in the year 2027. Because the proposed mortality assumption is a generational mortality table, each cohort of retirees based on birth year would

Other Valuation Assumptions

have a slightly different factor. In order to have one set of factors that will apply until the next experience study, we have calculated factors based on the mid-point of the expected timeframe in which the factors are expected to be effective.

Following is an age and service schedule for active members from the actuarial valuation as of June 30, 2023, who are eligible for benefits under the money purchase formula. Approximately 7,500 to 8,500 members are eligible to retire immediately under early or normal retirement eligibility conditions and the money purchase formula.

Age	Service - Academic						Total
	< 10	10-14	15-19	20-24	25-29	30+	Total
<50	37	85	276	397	42		837
50-54	41	48	246	547	247	28	1,157
55-59	41	59	188	489	361	142	1,280
60-64	41	38	168	380	309	240	1,176
65-69	36	26	113	222	164	220	781
70-74	15	15	80	104	73	121	408
75+	3	6	27	48	30	73	187
Total	214	277	1,098	2,187	1,226	824	5,826
Age	Service - Non-Academic						Total
	< 10	10-14	15-19	20-24	25-29	30+	Total
<50	49	62	480	1039	241	3	1,874
50-54	45	37	236	678	563	144	1,703
55-59	38	44	234	616	436	263	1,631
60-64	28	36	189	408	301	209	1,171
65-69	14	13	75	180	132	120	534
70-74	3	3	31	57	38	57	189
75+		2	8	25	21	28	84
Total	177	197	1,253	3,003	1,732	824	7,186
Age	Service - Total						Total
	< 10	10-14	15-19	20-24	25-29	30+	Total
<50	86	147	756	1,436	283	3	2,711
50-54	86	85	482	1,225	810	172	2,860
55-59	79	103	422	1,105	797	405	2,911
60-64	69	74	357	788	610	449	2,347
65-69	50	39	188	402	296	340	1,315
70-74	18	18	111	161	111	178	597
75+	3	8	35	73	51	101	271
Total	391	474	2,351	5,190	2,958	1,648	13,012

Other Valuation Assumptions

Load on Liabilities for Service Retirees with Non-finalized Benefits

Prior to 2013, there had been liability losses for recent retired members due to finalized benefits that were higher than the preliminary estimates. Therefore, an additional 10% load on the estimated benefits had been assumed. Beginning with the 2013 actuarial valuation, SURS provided additional data for members whose benefits had not been finalized to help improve the liability measurement. A "best formula" benefit was provided which was higher than the benefits which had originally been provided. In the 2014 valuation, the losses generated for these members were significantly reduced.

Beginning with the June 30, 2015, actuarial valuation, the assumption was changed to the following:
    (1) A load of 10% on liabilities is assumed for service retirees whose benefits have not been finalized as of the valuation date and a "best formula" benefit **was not** provided in the data by Staff
        (a) The assumption accounts for finalized benefits are on average about 10% higher than 100% of the preliminary estimated benefit
    (2) A load of 5% on liabilities is assumed for service retirees whose benefits have not been finalized as of the valuation date and a "best formula" benefit **was** provided in the data by Staff
        (a) The assumption accounts for finalized benefits are on average about 5% higher than the "best formula" benefit

On the following page is a comparison of the ratio of the finalized benefits to the estimated benefits based on the current assumptions and data from the 2022 and 2023 valuations. The ratio is calculated in accordance with the following example:

    (1) Best formula monthly benefit provided for 2022 actuarial valuation: $4,000
    (2) Projected benefit in 2023: $4,000*1.03 (COLA increase)*1.05 (5% load) = $4,326
    (3) Finalized benefit provided for the 2023 actuarial valuation: $4,200
    (4) Ratio of the finalized benefit to the estimated benefit: $4,200/$4,326-1= -3%

Following is the ratio of the total estimated to finalized benefits as of June 30, 2023 based on the current assumptions:

Total Finalized Benefits	$4,031,841
Total Estimated Benefits	4,107,725
Ratio (Finalized to Estimated)	-1.8%

The current assumptions resulted in estimated benefits that were slightly higher than the finalized benefits and is a slightly conservative assumption. We recommend no changes to the current assumptions.

Other Valuation Assumptions

Ratio of Finalized Benefits to Estimated Benefits (Based on Current Assumptions)

	General Formula	Money Purchase	Police/ Fire	Total	% of Total 2023	% of Total 2022	% of Total 2021
< -50%	11	1	-	12	1%	1%	0%
-50% - -41%	5	1	-	6	0%	0%	0%
-40% - -31%	5	4	-	9	1%	0%	0%
-30% - -21%	14	9	-	23	2%	1%	2%
-20% - -11%	81	64	-	145	10%	10%	8%
-10% - -1%	471	422	7	900	62%	61%	60%
0% - 9%	203	59	5	267	18%	20%	23%
10% - 19%	30	12	1	43	3%	3%	3%
20% - 29%	4	4	-	8	1%	0%	1%
30% - 39%	5	3	-	8	1%	1%	0%
40% - 49%	1	-	-	1	0%	0%	0%
>= 50%	31	4	-	35	2%	3%	2%
Totals	**861**	**583**	**13**	**1,457**	**100%**	**100%**	**100%**

GRS

Other Valuation Assumptions

Ratio of Finalized Benefits to Estimated Benefits (Based on Current Assumptions)

	General Formula	Money Purchase	Police/ Fire	Total	% of Total	% of Grand Total	General Formula	Money Purchase	Police/ Fire
-10%	18	10	0	28	**2%**	**2%**	2%	2%	0%
-9%	14	7	0	21	**2%**	**1%**	2%	1%	0%
-8%	41	27	0	68	**6%**	**5%**	5%	5%	0%
-7%	17	13	1	31	**3%**	**2%**	2%	2%	8%
-6%	33	46	0	79	**7%**	**5%**	4%	8%	0%
-5%	114	125	2	241	**20%**	**17%**	13%	21%	15%
-4%	77	82	1	160	**13%**	**11%**	9%	14%	8%
-3%	56	50	1	107	**9%**	**7%**	7%	9%	8%
-2%	57	34	1	92	**8%**	**6%**	7%	6%	8%
-1%	36	15	0	51	**4%**	**4%**	4%	3%	0%
0%	39	27	2	68	**6%**	**5%**	5%	5%	15%
1%	33	13	0	46	**4%**	**3%**	4%	2%	0%
2%	26	10	0	36	**3%**	**2%**	3%	2%	0%
3%	28	10	1	39	**3%**	**3%**	3%	2%	8%
4%	17	9	1	27	**2%**	**2%**	2%	2%	8%
5%	28	4	1	33	**3%**	**2%**	3%	1%	8%
6%	15	1	0	16	**1%**	**1%**	2%	0%	0%
7%	15	2	1	18	**2%**	**1%**	2%	0%	8%
8%	13	0	1	14	**1%**	**1%**	2%	0%	8%
9%	6	2	0	8	**1%**	**1%**	1%	0%	0%
10%	8	1	0	9	**1%**	**1%**	1%	0%	0%
Totals	**691**	**488**	**13**	**1,192**	**100%**	**82%**	**80%**	**84%**	**100%**

This is a more detailed exhibit of the one of the previous page with additional details for finalized benefits that were 10% higher or lower than estimated benefits based on the current assumption.

Other Valuation Assumptions

Increase in Pensionable Earnings Greater than 6% during the Final Average Compensation Period (6% Employer Billing Contributions)

Under Section 15-155(g) of the Illinois Compiled Statutes, a participant's employer is required to fund the value of increases in pensionable earnings greater than 6% that would be used in the determination of the final rate of earnings. No additional assumption is currently being made for earnings used in the calculation of the final rate of earnings.

Following is a history of the contributions received from employers due to this provision and the amount as a percentage of projected payroll (from the actuarial valuation used to determine the applicable fiscal year statutory contribution):

		$ in Millions		
Fiscal Year	Number of Participants	Amount from Employers	Projected Payroll	Amount as % of Payroll
2014	226	$1.9	$4,274.0	0.04%
2015	357	2.5	4,435.6	0.06%
2016	336	2.2	4,499.7	0.05%
2017	379	3.1	4,610.0	0.07%
2018	290	2.4	4,587.7	0.05%
2019	318	2.4	4,593.5	0.05%
2020	241	2.3	4,551.0	0.05%
2021	331	3.2	4,667.2	0.07%
2022	546	4.5	4,893.0	0.09%
2023	488	4.4	4,994.3	0.09%
Average	351	2.9	4,610.6	0.06%

Based on SURS experience, the proposed salary increase assumption is 5.00% for Academic and 5.25% for Non-Academic (4.25/4.50% for age 50 and older Academic/Non-Academic) grading down to an ultimate assumed rate of increase of 3.50% (3.15% for age 50 and older) for members with 10 or more years of service. Therefore, the actuarial valuation does not assume that members will receive pay increases in excess of 6.00% during the period used for the final rate of earnings. To the extent that members do receive increases in excess of 6.00% during the period used for the final rate of earnings, there will be a liability loss that will be partially offset by the employer contributions required by statute.

Due to the relatively small amount of contributions that are received to this provision, we recommend that no assumption be made for either the contributions received or the liability losses generated by members receiving pay increases in excess of 6.00% during the final average earnings period. In addition, we expect that the pay cap under Tier 2 will result is a decrease in the 6% employer billing contributions as a percentage of payroll in the future.

Other Valuation Assumptions

Buyout Election Assumptions

Under Public Act (PA) 100-0587, the State Universities Retirement System of Illinois ("SURS") shall offer an accelerated pension benefit payment to eligible members beginning on the implementation date and until June 30, 2021. (Public Act 101-0010 extended the buyout period from June 30, 2021, through June 30, 2024 and Public Act 102-718 extended the buyout period from June 30, 2024, through June 30, 2026 for both accelerated pension benefit options.) Assumptions are made and used in the actuarial valuations for these provisions.

There are two accelerated pension benefit payment options that are being offered: (1) for vested inactive members, a payment equal to 60% of the present value of the member's pension benefit in lieu of receiving any pension benefit; and (2) for active Tier 1 members eligible for retirement, a payment equal to 70% of the difference between (i) the present value of the automatic annual increases (AAI) to a Tier 1 member's retirement annuity under the current AAI provisions and (ii) the present value of the automatic annual increases to the Tier 1 member's retirement annuity under revised AAI provisions.

The accelerated pension benefit payments are to be paid from the State Pension Obligation Acceleration Bond Fund after SURS submits vouchers for the payments to the State Comptroller. The funds do not come from SURS assets.

Following are the buyout statistics for the automatic annual increase (AAI) buyout and the vested inactive member buyout (VIB) from June 10, 2019 (when the buyout was first offered) through June 30, 2023, as provided by the Retirement System and supported the rationale for using the 0% assumption in the actuarial valuation as of June 30, 2023.

Buyout Activity from Inception Through 6/30/2023

	AAI	VIB	Total
Number Eligible for the buyout*	11,209	23,669	34,878
Buyout applications received	422	151	573
Buyout election forms sent	283	124	407
Buyout election forms approved	180	91	271
Application %	3.8%	0.6%	1.6%
Approved %	1.6%	0.4%	0.8%
Approved buyout amount**	$17.0	$24.4	$41.3
Estimated Approved buyout (non EBA)	17.0	16.0	32.9
Estimated Liability Reduction	24.2	26.6	50.8

* Number eligible for the VIB buyout is the number of vested Tier 1 inactive members included in the actuarial valuation as of June 30, 2019 who are in the Traditional or Portable Plan. Number eligible for the AAI buyout is the number of total Tier 1 retirement claims (as provided by SURS).

** Includes amounts attributable to benefits that would have been payable from the Excess Benefit Arrangement (EBA). There was one $11.2 million VIB buyout of which $8.4 million was payable from the EBA during the year ended 6/30/2021.

The current buyout election assumption of 0% is a reasonable and modestly conservative assumption. Use of a slightly higher assumption over the remaining life of the program, while still reasonable, would lead to a reduction in the State contribution prior to the liability reduction actually occurring. We think SURS would

be better served by recognizing the liability reduction after it occurs rather than before. Therefore, we recommend maintaining the buyout election assumption of 0%. This means that the savings from the buyout program will be recognized each year as they occur – a common approach for this type of program.

SECTION III

COST IMPACT OF RECOMMENDED CHANGES

Cost Impact of Recommended Changes

The impact of adopting the recommended assumptions is summarized in the table below and on the following pages. The recommended assumptions increase the actuarial liability and decrease the funded ratio.

	Dollars in Millions			
	Actuarial Valuation as of 6/30/2023	Proposed Assumptions	Total Change	% Increase (Decrease)
Actuarial Accrued Liability				
1. Active Members	$ 12,465.9	$12,667.6	$ 201.7	1.62%
2. Benefit Recipients				
a. Retirement	$ 32,997.0	$33,238.5	$ 241.5	0.73%
b. Survivor	2,079.2	2,101.4	22.2	1.07%
c. Disability	284.1	285.9	1.8	0.63%
Total - Benefit Recipients	$ 35,360.3	$35,625.8	$ 265.5	0.75%
3. Other Inactive	$ 3,224.6	$ 3,276.9	$ 52.3	1.62%
4. Grand Total	$ 51,050.8	$51,570.3	$ 519.5	1.02%
	Actuarial Results			
Actuarial Value of Assets	$ 23,381.2	$23,381.2	$ 0.0	0.00%
Unfunded Actuarial Accrued Liability	$ 27,669.6	$28,189.1	$ 519.5	1.88%
Funded Ratio	45.80%	45.34%	-0.46%	-0.46%

Cost Impact of Recommended Changes – Projected Statutory Contributions

Comparison of Results from 2023 Actuarial Valuation With Results Using Recommended Assumptions Incl. 5-Year Phase-In of Change in Contribution Rate ($ in Millions)

| | SURS Contribution (Excluding RSP) | | | | RSP | | | | Combined SURS and RSP (Includes State and Employer Contribution) | | | | | |
| | Baseline | | Impact With Phase-In* | | Baseline | | Impact With Phase-In* | | Baseline | | Impact With Phase-In* | | Difference | |
Fiscal Year	Dollar	% of Pay	Dollar	% of Pay	Dollar	% of Pay	Dollar	% of Pay	Dollar	% of Pay	Dollar	% of Pay	Dollar	% of Pay
2024	$2,091.135	38.85%	$2,091.015	38.76%	$94.893	1.76%	$95.013	1.76%	$2,186.028	40.62%	$2,186.028		$0.000	
2025	2,167.649	39.30%	2,167.369	39.11%	100.345	1.82%	100.625	1.82%	2,267.994	41.12%	2,267.994		0.000	
2026	2,213.938	39.12%	2,235.133	39.22%	107.085	1.89%	107.559	1.89%	2,321.023	41.02%	2,342.693	41.11%	21.670	0.09%
2027	2,251.405	38.75%	2,280.427	38.89%	112.992	1.94%	113.711	1.94%	2,364.397	40.69%	2,394.138	40.83%	29.741	0.14%
2028	2,348.121	39.34%	2,383.342	39.49%	118.785	1.99%	119.778	1.98%	2,466.906	41.33%	2,503.120	41.47%	36.215	0.14%
2029	2,409.366	39.33%	2,452.718	39.51%	124.588	2.03%	125.870	2.03%	2,533.954	41.36%	2,578.588	41.54%	44.634	0.17%
2030	2,465.270	39.22%	2,516.752	39.44%	130.419	2.08%	131.990	2.07%	2,595.689	41.30%	2,648.742	41.51%	53.054	0.21%

| | Defined Benefit Payroll | | RSP Payroll | | Total Payroll | | Total Contributions ($) | | | Total Contributions (%) | | |
| | | | | | | | Baseline | No Phase-In | With Phase-In | | No Phase-In | With Phase-In |
Fiscal Year	Baseline	Impact	Baseline	Impact	Baseline	Impact	Baseline	Impact	Impact	Baseline	Impact	Impact
2024	$4,039.233	$4,050.576	$1,342.820	$1,344.399	$5,382.053	$5,394.975	$2,186.028	$2,186.028	$2,186.028	40.62%		
2025	4,093.458	4,116.217	1,421.755	1,425.409	5,515.213	5,541.626	2,267.994	2,267.994	2,267.994	41.12%		
2026	4,152.800	4,186.054	1,506.046	1,512.748	5,658.846	5,698.801	2,321.023	2,349.426	2,342.693	41.02%	41.23%	41.11%
2027	4,221.239	4,264.615	1,589.564	1,599.711	5,810.804	5,864.325	2,364.397	2,399.768	2,394.138	40.69%	40.92%	40.83%
2028	4,296.926	4,350.534	1,671.425	1,685.450	5,968.351	6,035.984	2,466.906	2,505.541	2,503.120	41.33%	41.51%	41.47%
2029	4,372.600	4,436.480	1,753.426	1,771.532	6,126.027	6,208.012	2,533.954	2,579.215	2,578.588	41.36%	41.55%	41.54%
2030	4,449.295	4,523.138	1,835.804	1,857.991	6,285.100	6,381.129	2,595.689	2,647.473	2,648.742	41.30%	41.49%	41.51%

The financial impact is illustrated based on a projection from the June 30, 2023, actuarial valuation which determines the fiscal year 2025 statutory contribution. The assumption changes are expected to first be effective with the June 30, 2024, actuarial valuation and will therefore first affect the fiscal year 2026 statutory contribution.

*Under the statutory funding policy, the contribution rate impact from assumption changes is to be recognized over a five-year period.

SECTION IV

RECOMMENDED ACTUARIAL ASSUMPTIONS

Recommended Actuarial Assumptions

Rate of Investment Return. For all purposes under SURS, the rate of investment return is assumed to be 6.50% per annum beginning with the June 30, 2021, actuarial valuation. This assumption is net of investment expenses.

Price Inflation (Increase in Consumer Price Index "CPI"). The assumed rate is 2.40% per annum, beginning with the June 30, 2024, actuarial valuation.

Effective Rate of Interest. The assumed rate credited to member accounts is 7.00% per annum, beginning with the June 30, 2024, actuarial valuation.

Cost of living adjustment "COLA." The assumed rate is 3.00% per annum for members hired before January 1, 2011, based on the benefit provision of 3.00% annual compound increases. The assumed rate is 1.20% for members hired on or after January 1, 2011, based on the benefit provision of increases equal to ½ of the increase in CPI with a maximum increase of 3.00%, beginning with the June 30, 2024, actuarial valuation.

Annual Compensation Increases. Each member's compensation is assumed to increase by 3.15% each year, 2.40% reflecting salary inflation and 0.75% reflecting standard of living increases. That rate is increased for members with less than 34 years of service to reflect merit, longevity and promotion increases. The rates are based on service at the beginning of the year and are as follows:

Service Year	Total Increase - Academic		Total Increase - Non-Academic	
	Under Age 50	50 and Older	Under Age 50	50 and Older
0-1	15.00%	13.00%	12.00%	11.00%
2	9.00%	9.25%	9.00%	8.25%
3	7.75%	7.50%	8.00%	7.00%
4	6.75%	6.75%	7.00%	6.00%
5	6.25%	6.25%	6.50%	5.50%
6	6.00%	5.75%	6.25%	5.25%
7	5.50%	5.25%	5.75%	4.75%
8-10	5.00%	4.25%	5.25%	4.50%
11-14	4.75%	3.75%	5.00%	4.00%
15-18	4.50%	3.50%	4.75%	3.75%
19	4.50%	3.25%	4.50%	3.50%
20-24	4.25%	3.25%	4.25%	3.50%
25-29	4.00%	3.25%	4.00%	3.50%
30-33	3.75%	3.25%	3.75%	3.50%
34+	3.50%	3.15%	3.50%	3.15%

General Wage Inflation. The assumed rate of general wage inflation is 3.15%.

Recommended Actuarial Assumptions

Mortality. The mortality assumptions are as follows:

Members classified as an employee type of academic:

Academic Applicable Group	Base Table Mortality Table	Male Scaling Factor	Female Scaling Factor
Preretirement	Pub-2010 Employee Mortality Table (for Teachers)	99%	100%
Postretirement (non-disabled)	Pub-2010 Healthy Retiree Mortality Table (for Teachers)	96%	103%
Postretirement (disabled)	Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees)	122%	106%

Members classified as an employee type of non-academic:

Non-Academic Applicable Group	Base Table Mortality Table	Male Scaling Factor	Female Scaling Factor
Preretirement	Pub-2010 Employee Mortality Table (for General Employees)	120%	104%
Postretirement (non-disabled)	Pub-2010 Healthy Retiree Mortality Table (for General Employees)	102%	104%
Postretirement (disabled)	Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees)	122%	106%

Members classified as an employee type of police:

Non-Academic Applicable Group	Base Table Mortality Table	Male Scaling Factor	Female Scaling Factor
Preretirement	Pub-2010 Employee Mortality Table (for Safety Employees)	100%	100%
Postretirement (non-disabled)	Pub-2010 Healthy Retiree Mortality Table (for Safety Employees)	100%	100%
Postretirement (disabled)	Pub-2010 Disabled Retiree Mortality Table (for Safety Employees)	100%	100%

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the MP-2021 projection scale.

Recommended Actuarial Assumptions

Following are the future life expectancies for postretirement (non-disabled) mortality:

| | Future Life Expectancy (years) in 2023 | | | | Future Life Expectancy (years) in 2030 | | | |
| | Academic | | Non Academic | | Academic | | Non Academic | |
Age	Male	Female	Male	Female	Male	Female	Male	Female
35	53.87	55.56	50.93	53.86	54.40	56.03	51.59	54.42
40	48.62	50.30	45.67	48.56	49.15	50.78	46.32	49.12
45	43.39	45.06	40.44	43.28	43.92	45.54	41.07	43.84
50	38.19	39.83	35.34	38.11	38.71	40.31	35.95	38.66
55	33.07	34.69	30.46	33.14	33.58	35.17	31.05	33.68
60	28.09	29.74	25.75	28.28	28.59	30.20	26.31	28.80
65	23.31	24.91	21.26	23.57	23.77	25.34	21.77	24.03
70	18.76	20.23	17.01	19.06	19.16	20.60	17.44	19.46
75	14.53	15.78	13.10	14.83	14.86	16.12	13.44	15.17

| | Future Life Expectancy (years) in 2023 | | Future Life Expectancy (years) in 2030 | |
| | Police | | Police | |
Age	Male	Female	Male	Female
35	53.52	55.80	54.06	56.27
40	48.28	50.54	48.81	51.02
45	43.05	45.30	43.58	45.78
50	37.85	40.07	38.37	40.55
55	32.73	34.93	33.24	35.41
60	27.77	29.97	28.27	30.43
65	23.00	25.13	23.46	25.56
70	18.47	20.44	18.87	20.81
75	14.26	15.98	14.59	16.31

Recommended Actuarial Assumptions

Disability.

A table of base disability incidence rates follow:

Age	Academic Male	Academic Female	Non-Academic Male	Non-Academic Female	Police Male	Police Female
20	0.007410%	0.013120%	0.027170%	0.036080%	0.054340%	0.072160%
21	0.007590%	0.013880%	0.027830%	0.038170%	0.055660%	0.076340%
22	0.007770%	0.014640%	0.028490%	0.040260%	0.056980%	0.080520%
23	0.007950%	0.015400%	0.029150%	0.042350%	0.058300%	0.084700%
24	0.008130%	0.016160%	0.029810%	0.044440%	0.059620%	0.088880%
25	0.008310%	0.016920%	0.030470%	0.046530%	0.060940%	0.093060%
26	0.008490%	0.017680%	0.031130%	0.048620%	0.062260%	0.097240%
27	0.008670%	0.018440%	0.031790%	0.050710%	0.063580%	0.101420%
28	0.008850%	0.019240%	0.032450%	0.052910%	0.064900%	0.105820%
29	0.009000%	0.020000%	0.033000%	0.055000%	0.066000%	0.110000%
30	0.009450%	0.021640%	0.034650%	0.059510%	0.069300%	0.119020%
31	0.009900%	0.023280%	0.036300%	0.064020%	0.072600%	0.128040%
32	0.010350%	0.024920%	0.037950%	0.068530%	0.075900%	0.137060%
33	0.010770%	0.026560%	0.039490%	0.073040%	0.078980%	0.146080%
34	0.011220%	0.028200%	0.041140%	0.077550%	0.082280%	0.155100%
35	0.011850%	0.029800%	0.043450%	0.081950%	0.086900%	0.163900%
36	0.012450%	0.031440%	0.045650%	0.086460%	0.091300%	0.172920%
37	0.013080%	0.033080%	0.047960%	0.090970%	0.095920%	0.181940%
38	0.013710%	0.034720%	0.050270%	0.095480%	0.100540%	0.190960%
39	0.014310%	0.036360%	0.052470%	0.099990%	0.104940%	0.199980%
40	0.016080%	0.038000%	0.058960%	0.104500%	0.117920%	0.209000%
41	0.017850%	0.039640%	0.065450%	0.109010%	0.130900%	0.218020%
42	0.019620%	0.041280%	0.071940%	0.113520%	0.143880%	0.227040%
43	0.021390%	0.042920%	0.078430%	0.118030%	0.156860%	0.236060%
44	0.023160%	0.044560%	0.084920%	0.122540%	0.169840%	0.245080%
45	0.025350%	0.046200%	0.092950%	0.127050%	0.185900%	0.254100%
46	0.027570%	0.047840%	0.101090%	0.131560%	0.202180%	0.263120%
47	0.029790%	0.049480%	0.109230%	0.136070%	0.218460%	0.272140%
48	0.031980%	0.051120%	0.117260%	0.140580%	0.234520%	0.281160%
49	0.034200%	0.052760%	0.125400%	0.145090%	0.250800%	0.290180%
50	0.036420%	0.054400%	0.133540%	0.149600%	0.267080%	0.299200%
51	0.038610%	0.056040%	0.141570%	0.154110%	0.283140%	0.308220%
52	0.040830%	0.057680%	0.149710%	0.158620%	0.299420%	0.317240%
53	0.043050%	0.059320%	0.157850%	0.163130%	0.315700%	0.326260%
54	0.045240%	0.060960%	0.165880%	0.167640%	0.331760%	0.335280%
55 & Older	0.046560%	0.062600%	0.170720%	0.172150%	0.341440%	0.344300%

Disability rates apply during the retirement eligibility period. Members are assumed to first receive disability benefits (DB) and then receive disability retirement annuity (DRA) benefits.

For police officers, 50% of disabilities are assumed to occur in the line of duty and 50% of disabilities are assumed to be ordinary.

Recommended Actuarial Assumptions

Retirement. Upon eligibility, active members are assumed to retire as follows:

Nearest Age @ Retirement	Tier 1					Tier 2				
	Normal (Unreduced) Retirement			Early (Reduced) Retirement		Normal (Unreduced) Retirement			Early (Reduced) Retirement	
	Police	Academic	Non-Academic	Academic	Non-Academic	Police	Academic	Non-Academic	Academic	Non-Academic
Under 50		55.0%	55.0%							
50	50.0%	55.0%	40.0%							
51	40.0%	40.0%	30.0%							
52	40.0%	40.0%	30.0%							
53	40.0%	30.0%	30.0%							
54	40.0%	30.0%	30.0%							
55	50.0%	20.0%	25.0%	4.0%	8.5%					
56	30.0%	18.0%	25.0%	3.0%	5.5%					
57	30.0%	18.0%	25.0%	4.0%	6.0%					
58	30.0%	18.0%	25.0%	4.0%	6.0%					
59	30.0%	18.0%	25.0%	4.0%	8.0%					
60	20.0%	12.0%	20.0%			60.0%				
61	15.0%	12.0%	15.0%			25.0%				
62	15.0%	12.0%	17.0%			25.0%			15.0%	20.0%
63	15.0%	13.0%	17.0%			25.0%			10.0%	12.0%
64	15.0%	13.0%	17.0%			25.0%			10.0%	12.0%
65	40.0%	17.0%	25.0%			15.0%			10.0%	12.0%
66	40.0%	17.0%	25.0%			15.0%			10.0%	12.0%
67	40.0%	17.0%	25.0%			15.0%	30.0%	30.0%		
68	40.0%	17.0%	25.0%			25.0%	17.0%	25.0%		
69	40.0%	17.0%	25.0%			25.0%	17.0%	25.0%		
70	100.0%	17.0%	22.0%			100.0%	17.0%	22.0%		
71-79	100.0%	17.0%	22.0%				17.0%	22.0%		
80+	100.0%	100.0%	100.0%				100.0%	100.0%		

Members who retire are assumed to elect the most valuable option on a present value basis – refund of contributions (or portable lump sum retirement, if applicable) or a retirement annuity.

For purposes of the projections in the actuarial valuation, members of the Retirement Savings Plan are assumed to retire in accordance with the Tier 1 and Tier 2 retirement rates (based on hire date).

Recommended Actuarial Assumptions

General Turnover. A table of termination rates based on experience in the 2020-2023 period. The assumption is a table of turnover rates by years of service. A sample of these rates follows:

Years of Service	Academic	Non-Academic
0	15.00%	14.00%
1	15.00%	14.00%
2	11.00%	14.00%
3	10.00%	13.00%
4	9.00%	12.00%
5	8.00%	10.50%
6	7.00%	8.50%
7	6.00%	7.50%
8	5.50%	6.50%
9	5.00%	6.00%
10	4.00%	5.00%
11	3.50%	5.00%
12	3.00%	4.00%
13	2.50%	3.00%
14	2.50%	3.00%
15	2.00%	3.00%
16	2.00%	2.50%
17	2.00%	2.50%
18	2.00%	2.50%
19	2.00%	2.50%
20	1.50%	2.00%
21	1.50%	2.00%
22	1.50%	2.00%
23	1.50%	2.00%
24	1.50%	2.00%
25	1.25%	1.25%
26	1.25%	1.25%
27	1.25%	1.25%
28	1.25%	1.25%
29	1.25%	1.25%

A termination rate of 100% is assumed at three years of service for members classified as part time for valuation purposes.

Members who terminate with at least five years of service (10 years of service for Tier 2 members) are assumed to elect the most valuable option on a present value basis – refund of contributions or a deferred benefit.

Termination rate for 29 years of service used for Tier 2 members until retirement eligibility is met.

Recommended Actuarial Assumptions

Load on Liabilities for Service Retirees With Non-finalized Benefits. A load of 10% on liabilities for service retirees whose benefits have not been finalized as of the valuation date is assumed to account for finalized benefits that on average are 10% higher than 100% of the preliminary estimated benefit. A load of 5% is used if a "best formula" benefit was provided in the data by Staff.

Governor's Pay. The governor's pay is $190,700 as of June 30, 2023, and budgeted as $216,000 for fiscal year ending June 30, 2024, and is expected to increase each year by the assumed rate of increase in the Tier 2 pay cap (1/2 the increase in CPI or 1.20%).

Buyout Election Assumption. 0% of eligible Tier 1 active members are assumed to elect to receive a reduced and delayed AAI benefit at retirement and an accelerated pension benefit option in accordance with Public Acts 100-0587 and 101-0010. 0% of eligible inactive members are assumed to elect to receive an accelerated pension benefit option in lieu of an annuity at retirement in accordance with Public Acts 100-0587 and 101-0010.