



Benefits and Actuarial Committee (B&A) Meeting

GOTOWEBINAR

Monday, 4/19/2021

1:00 - 3:30 PM ET

I. Welcome and Introductions

II. Public Comment

III. Approve Minutes

BA Minutes 02.11.2021 final - Page 2

IV. Action Item

• **Experience Study Presentation**

RBA Experience Study - Page 7

2020 VRS Experience Study FINAL - Page 8

V. Information Item

• **Upcoming B&A Committee Meetings:**

- June 9, 2021 at 1:00 p.m.

- October 13, 2021 at 10:00 a.m.

- November 15, 2021 at 1:00 p.m.

VI. Other Business

Minutes

An electronic meeting of the Virginia Retirement System Benefits and Actuarial Committee was held on February 11, 2021 in accordance with § 2.2-3708.2(A)(3) of the *Code of Virginia* and in accordance with guidance provided in § 4-0.01 of Chapter 56 of the 2020 Special Session I Acts of Assembly, with the following members participating:

Wallace G. Harris, Ph.D., Chair
William A. Garrett, Vice Chair
Michael P. Disharoon

Board members present:

O'Kelly E. McWilliams, III, Board Chair (*entered at 1:35 p.m.*)
Joseph W. Montgomery, Board Vice Chair
Hon. J. Brandon Bell, II

VRS Staff:

Patricia Bishop, Jennifer Schreck, Rory Badura, Judy Bolt, Ty Bowers, Jeanne Chenault, Michael Cooper, Sara Denson, Valerie Disanto, Barry Faison, Andy Feagans, Brian Goodman, Krystal Groff, Robert Irving, Kathy Quiriconi, Angela Payne, Jillian Sherman and Cindy Wilkinson.

Guests participating were:

Latosha Johnson, Department of Planning and Budget; and Bea Snidow, Virginia Education Association.

The meeting convened at 1:11 p.m.

Opening Remarks

Mr. Harris called the meeting to order and welcomed everyone to the February 11, 2021 meeting of the Benefits and Actuarial Committee.

Mr. Harris noted that given the current circumstances related to COVID-19, the Committee is unable to meet in person and, therefore, is using electronic means to hold the meeting. The meeting is being held in accordance with § 2.2-3708(A)(3) of the *Code of Virginia* and Chapter 56 of the 2020 Special Session I Acts of Assembly as they relate to conducting business during the pandemic.

Next, Mr. Harris took attendance with the following roll call*:

Mr. Bell: Here
Mr. Disharoon: Here
Mr. Garrett: Here
Mr. Montgomery: Here
Mr. Harris: Here

**O'Kelly E. McWilliams, III was not present at this time.*

Public Comment

In accordance with Chapter 56 of the 2020 Special Session I Acts of Assembly, the Committee opened the floor for public comment. Mr. Harris noted that no members of the public registered to comment at the electronic meeting.

Approve Minutes

Upon Mr. Montgomery's motion, with a second by Mr. Disharoon, the Committee approved the minutes of its November 16, 2020 meeting upon the following roll call vote*:

Mr. Bell: Aye
Mr. Disharoon: Aye
Mr. Garrett: Aye
Mr. Montgomery: Aye
Mr. Harris: Aye

*Mr. McWilliams was not present during this vote.

Statutory Cost of Living Adjustments

Virginia Sickness and Disability Program (VSDP)

Rory Badura, Senior Staff Actuary, presented the recommendations of Cavanaugh Macdonald Consulting, LLC, the Plan Actuary, regarding statutory annual adjustments to Virginia Sickness and Disability Program (VSDP) creditable compensation for members on long-term disability. For VSDP, Mr. Badura advised that the Plan Actuary recommends an increase in the creditable compensation for VRS pension benefit purposes of 2.12%, effective July 1, 2021. In addition, a cost of living adjustment (COLA) in the amount of 1.23% shall be applied to long-term disability (LTD) benefit payments for Plan 1, Plan 2 and Hybrid Retirement Plan members who have been recipients for at least one year.

Following some discussion, the Committee took up the following RBA for consideration:

RBA: Approval of July 1, 2021 Increase Relating to VSDP Creditable Compensation and VSDP COLA

Request for Board Action: Effective July 1, 2021 the following increases shall apply:

- *The creditable compensation used in calculating the member's average final compensation at retirement shall be increased in the amount of 2.12% for a Plan 1, Plan 2 or Hybrid member who has been the recipient of long-term disability (LTD) benefits for at least one year under the Virginia Sickness and Disability Program (VSDP); and*
- *A cost of living adjustment of 1.23% shall be applied to the net LTD benefit payment for Plan 1 members vested prior to January 1, 2013, Plan 1 members not vested by January 1, 2013, and all Plan 2 and Hybrid members.*

Upon a motion by Mr. Montgomery, with a second by Mr. Disharoon, the Committee recommended approval of the action to the full Board of Trustees upon the following roll call vote*:

Mr. Bell: Aye
Mr. Disharoon: Aye
Mr. Garrett: Aye
Mr. Montgomery: Aye
Mr. Harris: Aye

**Mr. McWilliams was not present during this vote.*

Virginia Local Disability Program (VLDP)

Next, Mr. Badura advised that the Plan Actuary recommended an increase in the creditable compensation of 4.00% for recipients of long-term disability (LTD) benefits under the Virginia Local Disability Program (VLDP), effective July 1, 2021. The VLDP plan does not provide for a COLA on LTD benefits being received.

The recommendations and calculations presented by the Plan Actuary for increases in creditable compensation in VSDP and VLDP were reviewed by VRS staff and Internal Audit.

RBA: Approval of July 1, 2021 Increase Relating to VLDP Creditable Compensation

Request for Board Action: *Effective July 1, 2021, each recipient of LTD benefits under the Virginia Local Disability Program (VLDP) who has been receiving LTD benefits for at least one calendar year, and who ultimately retires directly from LTD, will have their creditable compensation at date of disability increased by an amount set by the Board to be used in determining the member's average final compensation for disability retirement. The recommendation applicable July 1, 2021 is an increase of 4.0% to be applied to a recipient's creditable compensation.*

Upon a motion by Mr. Montgomery, with a second by Mr. Disharoon, the Committee recommended approval of the action to the full Board upon the following roll call vote*:

Mr. Bell: Aye
Mr. Disharoon: Aye
Mr. Garrett: Aye
Mr. Montgomery: Aye
Mr. Harris: Aye

**Mr. McWilliams was not present during this vote.*

Information Items

2021 COLAs Called for Under Statute Not Requiring Board Approval

Mr. Badura noted that, by statute, VRS cost of living increases are based on the consumer price index for all items, all urban consumers, as published by the Bureau of Labor Statistics of the U.S. Department of Labor. Mr. Badura advised that the COLA increase of 1.23% is applicable to eligible Plan 1, Plan 2 and Hybrid Plan members effective July 1, 2021. This figure was calculated by the VRS Plan Actuary,

Cavanaugh Macdonald Consulting, LLC, and verified by VRS and Internal Audit staff. The COLA did not require action by the Committee.

Mr. Badura also advised that in accordance with the requirements of the *Code of Virginia*, the Hazardous Duty Supplement is increased biennially using applicable cost of living adjustments published by the Social Security Administration since the last applicable increase. The biennial Social Security increase of 2.92% resulted in an increase in the annual Hazardous Duty Supplement from \$14,244 to \$14,664 for fiscal year 2021. The increase in the Hazardous Duty Supplement did not require action by the Committee. The calculations were reviewed by VRS staff and Internal Audit.

The Group Life Insurance Program minimum benefit for members retired with at least 30 years of service is to be increased by the same COLA applicable to VRS Plan 2 members, or 1.23%, effective July 1, 2021. The new minimum life insurance payout effective July 1, 2021 will be \$8,722. The Group Life Insurance Program minimum did not require action by the Committee. The calculations were reviewed by VRS staff and Internal Audit.

Mr. Harris thanked Mr. Badura for his presentation.

Legislative Update

Next, Ms. Wilkinson provided an update on the VRS-related legislation in the 2021 Regular and Special General Assembly sessions.

Upcoming B&A Meetings

Lastly, Mr. Harris reviewed the B&A Committee's upcoming meetings:

- April 19, 2021 at 1:00 p.m.
- June 9, 2021 at 1:00 p.m.
- October 13, 2021 at 10:00 a.m.
- November 15, 2021 at 1:00 p.m.

Adjournment

Upon a motion by Mr. Montgomery, with a second by Mr. Disharoon, the Committee agreed to adjourn the meeting upon the following roll call vote:

Mr. Bell: Aye
Mr. Disharoon: Aye
Mr. Garrett: Aye
Mr. McWilliams: Aye
Mr. Montgomery: Aye
Mr. Harris: Aye

There being no further business, the meeting concluded at 1:47 p.m.

Date

Wallace G. Harris, Chair
Benefits and Actuarial Committee



Approval of Actuarial Assumptions based on July 1, 2016 to June 30, 2020 Experience Study.

Requested Action

The VRS Board of Trustees approves its plan actuary's recommendations as presented in the Experience Study (7/1/2016 to 6/30/2020) to change various assumptions, including: certain demographic assumptions regarding mortality rates, retirement rates, withdrawal rates, and disability rates; method changes regarding development of normal cost rates and reflection of increasing hybrid plan payroll, as well as various Other Post-Employment Benefits (OPEB) specific assumption related to the Line of Duty Plan, Health Insurance Credit program, and the VSDP and VLDP disability programs.

Description/Background

The *Code of Virginia* requires the Board to cause an actuarial investigation to be made of the actual experience under the Retirement System at least once in each four-year period. The Board is also required to cause actuarial gain/loss analyses to be made in conjunction with each actuarial valuation of the System. Finally, pursuant to such investigations and analyses, the Board is required to periodically revise the actuarial assumptions used in the computation of employer contribution rates.

Accordingly, following its review of the findings of the Experience Study for the period of July 1, 2016 to June 30, 2020, the Board approves the assumption changes for various retirement and OPEB programs administered by VRS recommended by Cavanaugh Macdonald, the VRS plan actuary.

The experience study for the period of July 1, 2016 to June 30, 2020 was conducted as required by the provisions of *Code of Virginia* § 51.1-124.22(A)(4). A copy of the Experience Study Summary is attached.

Rationale for Requested Action

The *Code of Virginia* requires the Board to obtain an actuarial experience study every four years. The VRS plan actuary, Cavanaugh Macdonald Consulting, LLC, conducted the study and recommended assumption changes based on the findings of the July 1, 2016 to June 30, 2020 Experience Study.

Authority for Requested Action

The Board's authority for this action is contained in *Code of Virginia* § 51.1-124.22(A)(4).

The above action is approved.

O'Kelly E. McWilliams, III, Chairman
VRS Board of Trustees

Date



Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

Experience Study 7/1/2016 to 6/30/2020



Virginia
Retirement
System

April 19, 2021



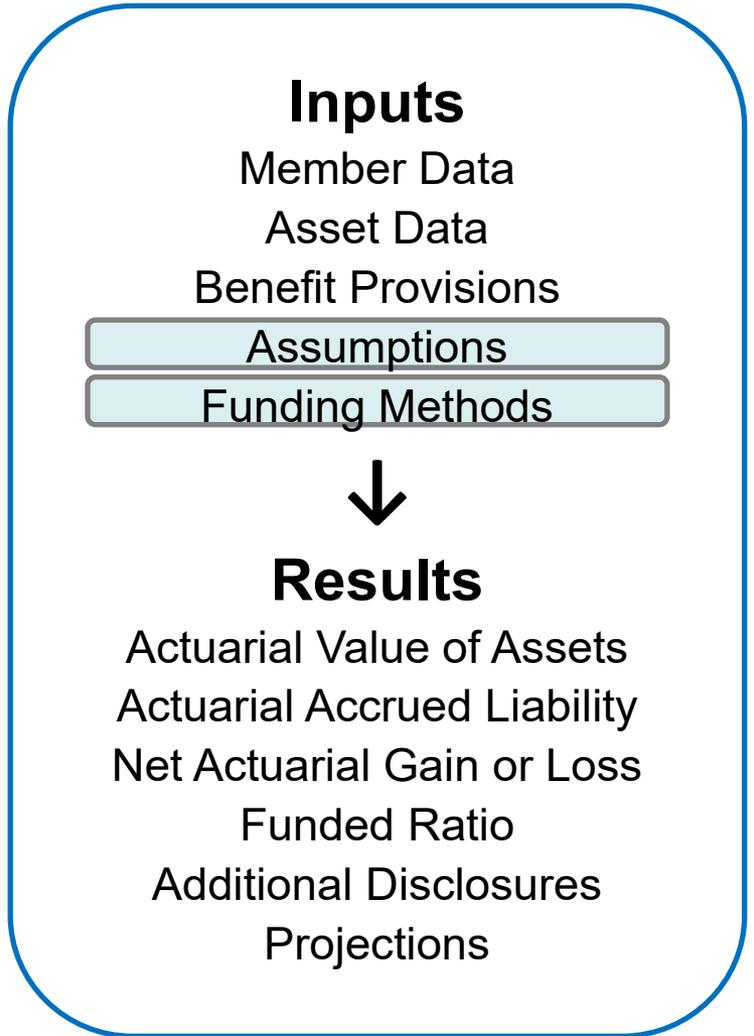
Table of Contents

- Purpose of the Experience Study – Slide 3
- General Findings – Slide 8
- Economic Assumptions – Slide 15
- Funding Policy – Slide 25
- Demographic Assumptions – Slide 27
- OPEB Assumptions – Slide 46
- Cost Impact – Slide 54
- Appendix – Slide 77



Purpose of the Experience Study

- Over the short term, employer contributions are determined by the annual actuarial valuation based on estimated benefits, expenses and investment return using Assumptions and Funding Methods recommended by the actuary and adopted by the Board through the Experience Study process.
- Over the long term, employer contributions are adjusted to reflect actual benefits, expenses and investment return.
- Selection of assumptions and methods that are too optimistic can result in costs being pushed to future generations, while assumptions and methods that are too pessimistic can put undue pressure on current resources.





Actuarial Standards of Practice (ASOPs)



The following ASOPs guide our assumption and method recommendations:

- ASOP 4 - Measuring Pension Obligations and Determining Pension Plan Costs or Contributions
- ASOP 5 - Incurred Health and Disability Claims
- ASOP 6 - Measuring Retiree Group Benefit Obligations
- ASOP 18 - Long-Term Care Insurance
- ASOP 27 - Selection of Economic Assumptions for Measuring Pension Obligations
- ASOP 35 - Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations
- ASOP 44 - Selection and Use of Asset Valuation Methods for Pension Valuations



Why Perform an Experience Study

- Statute (§ 51.1-124.22.A.4) requires preparation of experience study at least once every four years. This experience study covers the period from July 1, 2016 through June 30, 2020.
- Experience study compares actual VRS economic and demographic experience with expected experience based on current assumptions.
- Purpose of the experience study is to develop a best estimate of the future based on recent experience and emerging trends.
- Revised actuarial assumptions resulting from experience study used in the computation of employer contribution rates. June 30, 2021 is next rate setting valuation using revised assumptions.



Experience Study Process

- Based on four-year period from July 1, 2016 – June 30, 2020
 - Compare Experience (“Actual”) with Assumptions (“Expected”) for demographic assumptions
 - Consider trends observed during the previous Experience Study

- Make Judgments About Future Trends:
 - Plan-Specific Experience vs. National Trends
 - Long-Term vs. Short-Term Factors

- Recommend changes in assumptions and funding methodology as needed based on ASOPs

- Implement effective with the June 30, 2021 Actuarial Valuation, which determines contribution rates effective July 1, 2022

- Next Experience Study is scheduled to be implemented effective with the June 30, 2025 Actuarial Valuation.



Experience Study Process COVID-19



- The impact of the COVID-19 pandemic was considered in this experience review
- No explicit changes were incorporated at this time due to the level of uncertainty regarding the effect of the pandemic on both health care costs and decremental experience such as mortality, retirement and disability
- We have considered available information but do not believe that there is yet sufficient data to warrant the further modification of any of the assumptions other than to retain margin in certain assumptions such as disability incidence and presumptive approval for LODA benefits
- We will continue to monitor the situation as data emerges and advise the Board in the future of any adjustments that we believe would be appropriate

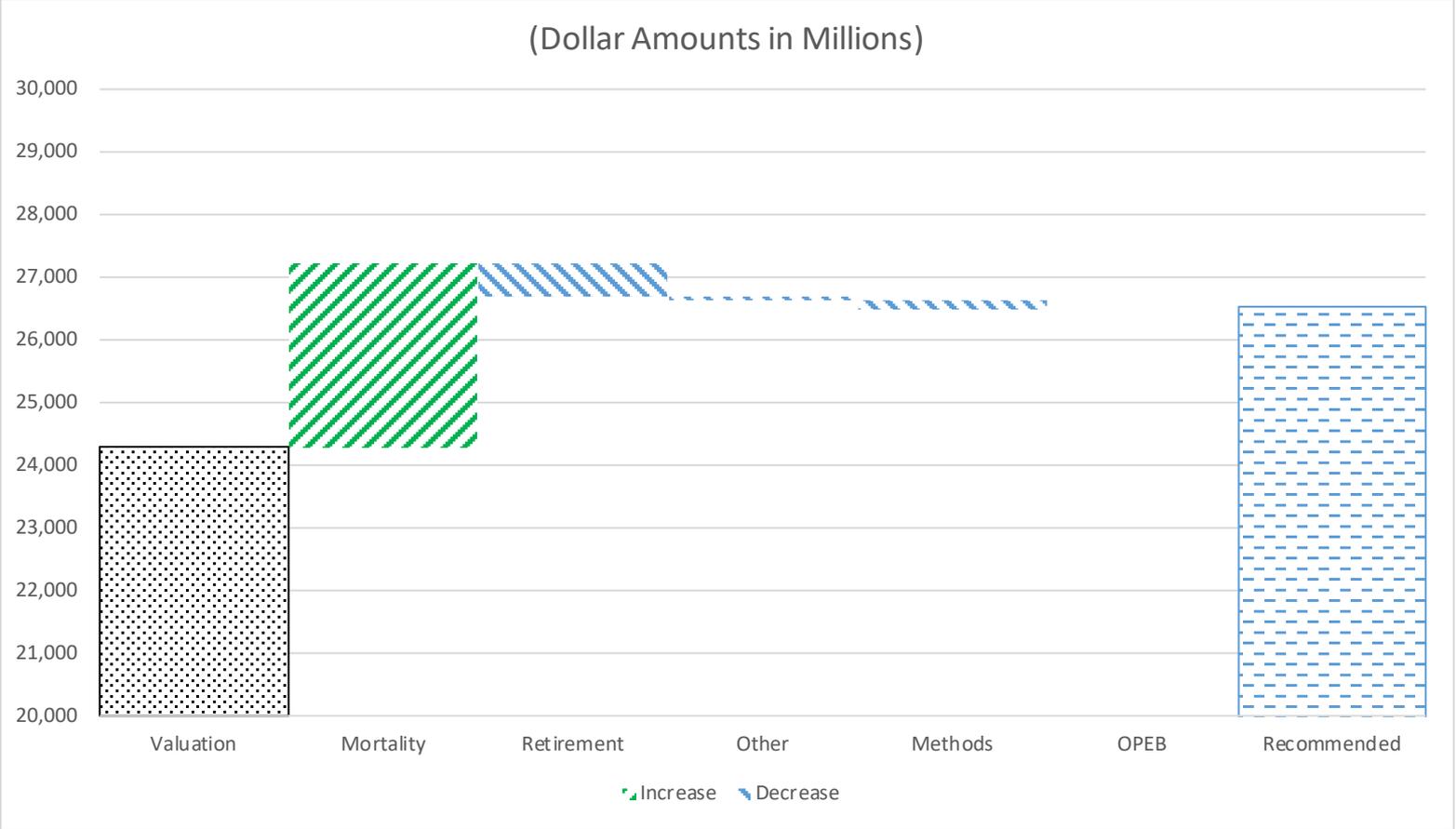


General Findings

- Cost Impact
 - Generally, funded status will decrease and employer contribution rates will increase as a result of these recommendations
- Economic
 - Reduction in discount rate to 6.75% for June 30, 2019 valuation results in not having to act now
 - No need to change *most* economic assumptions
- Demographic
 - Changing mortality assumption from a Margin approach on a headcount weighted basis to a Generational Mortality approach on a benefits weighted basis:
 - was the primary driver of lower funded status and higher employer contribution rates
 - will reduce the likelihood of large increases with future experience studies
 - Adjustments for rates of termination, retirement, disability generally increased the funded ratio and decreased employer contribution rates
 - Many refinements for OPEB assumptions had mixed impact



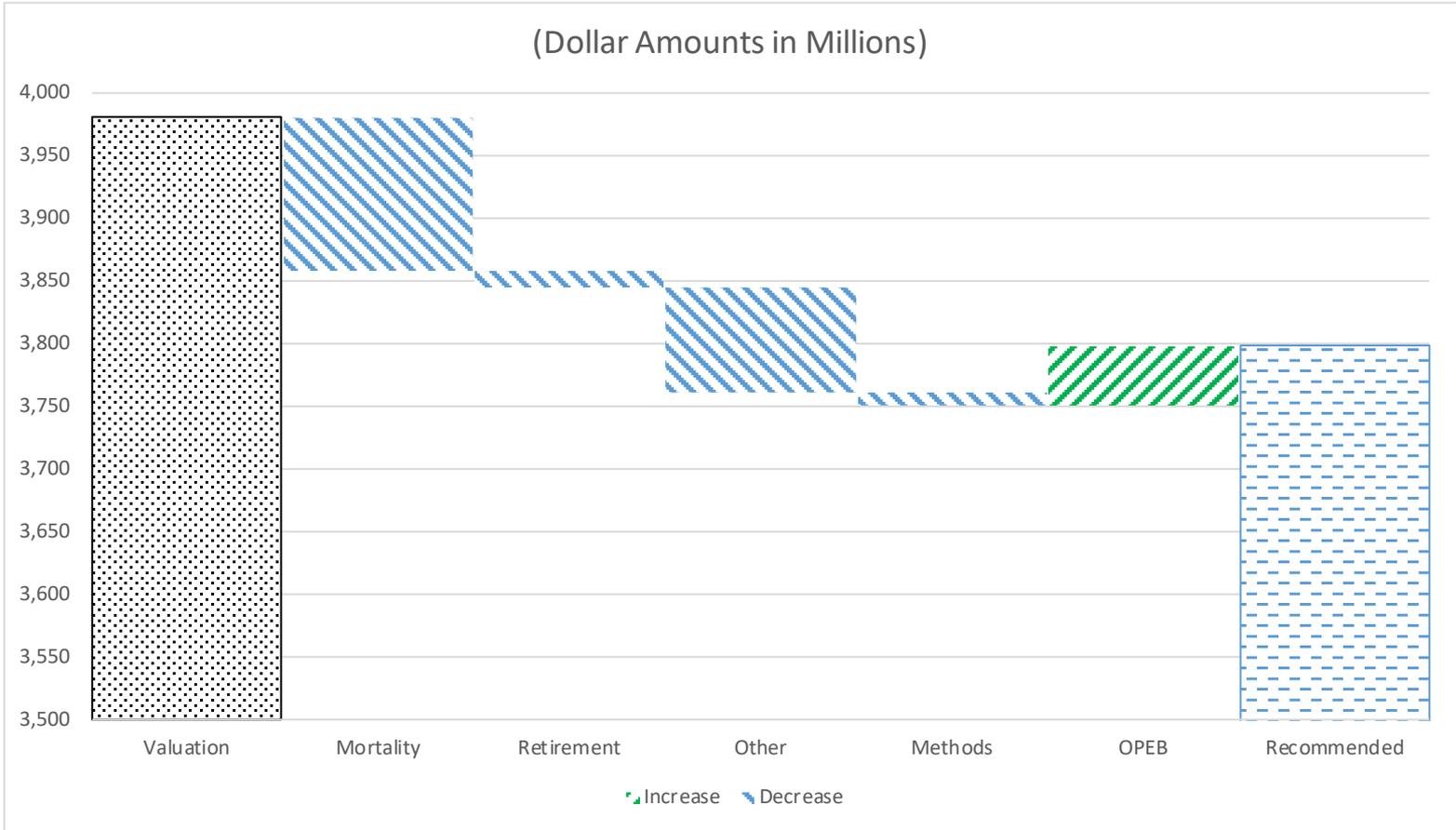
Cost Impact Change in UAAL by Source Pension Plans



The mortality recommendation was the largest driver of costs for the pension plans, with other sources partially offsetting the increase.



Cost Impact Change in UAAL by Source OPEB Plans

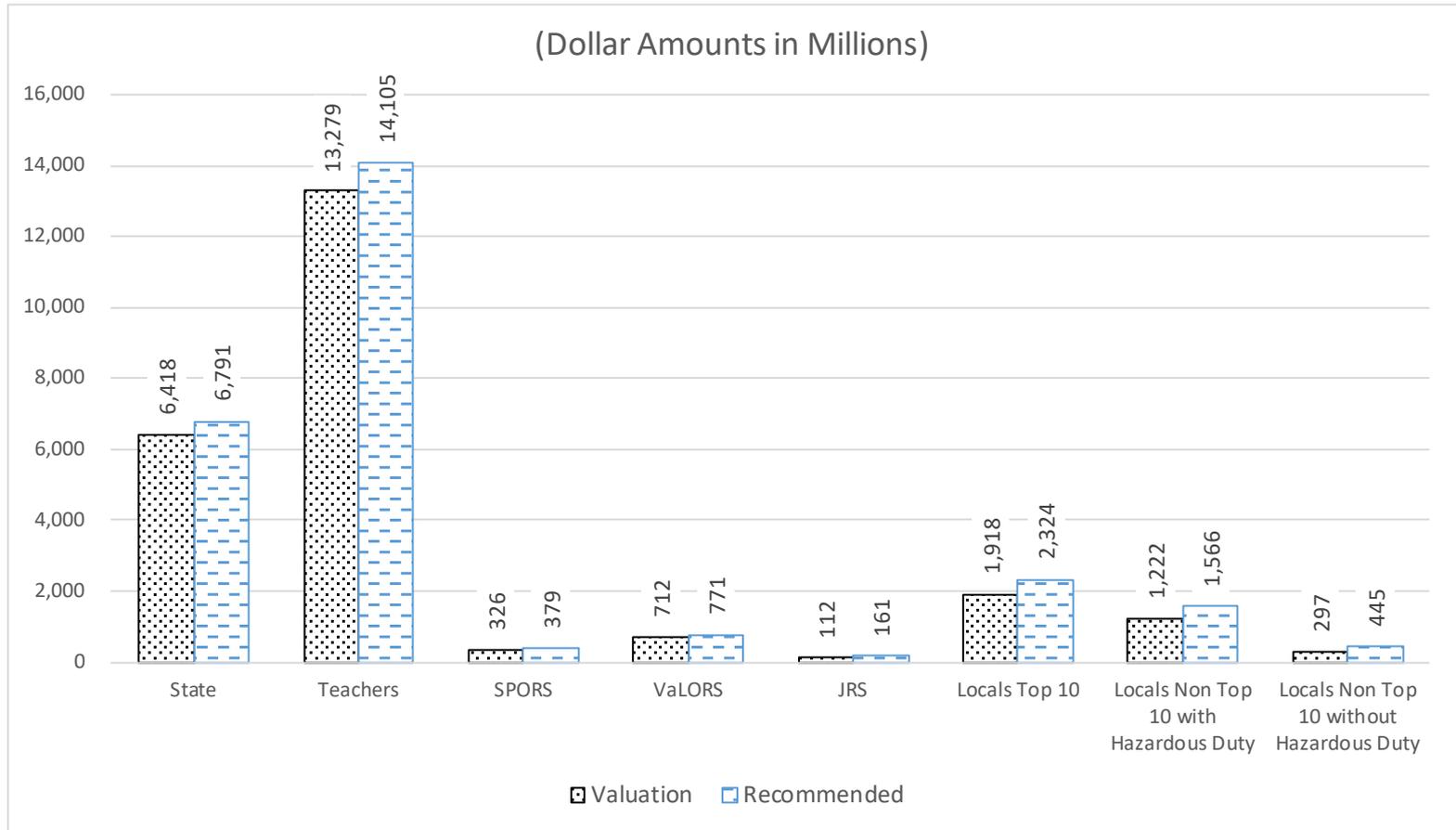


The impact of the recommendations on UAAL was mixed. Unlike Pension, mortality decreased UAAL due to reflecting longer life expectancies for Group Life Insurance.



Cost Impact

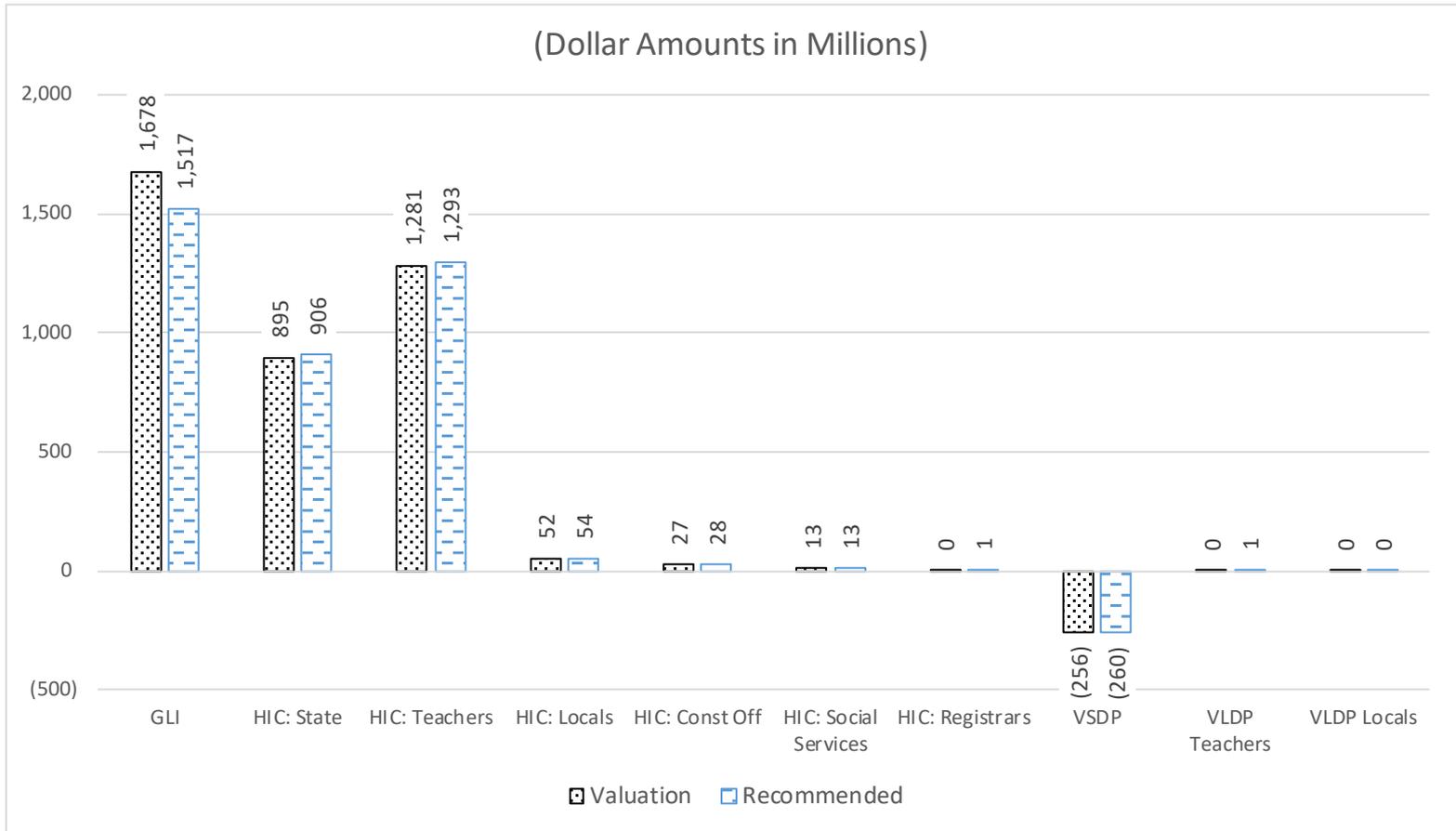
Unfunded Actuarial Accrued Liability (UAAL) Pension Plans



The impact of the recommendations was an increase in actuarial accrued liability and as a result the UAAL. The increase in UAAL is leveraged - the increase in Locals UAAL was much larger than that of State or Teachers. This is due to Locals being well funded compared to State or Teachers.



Cost Impact Unfunded Actuarial Accrued Liability (UAAL) OPEB Plans

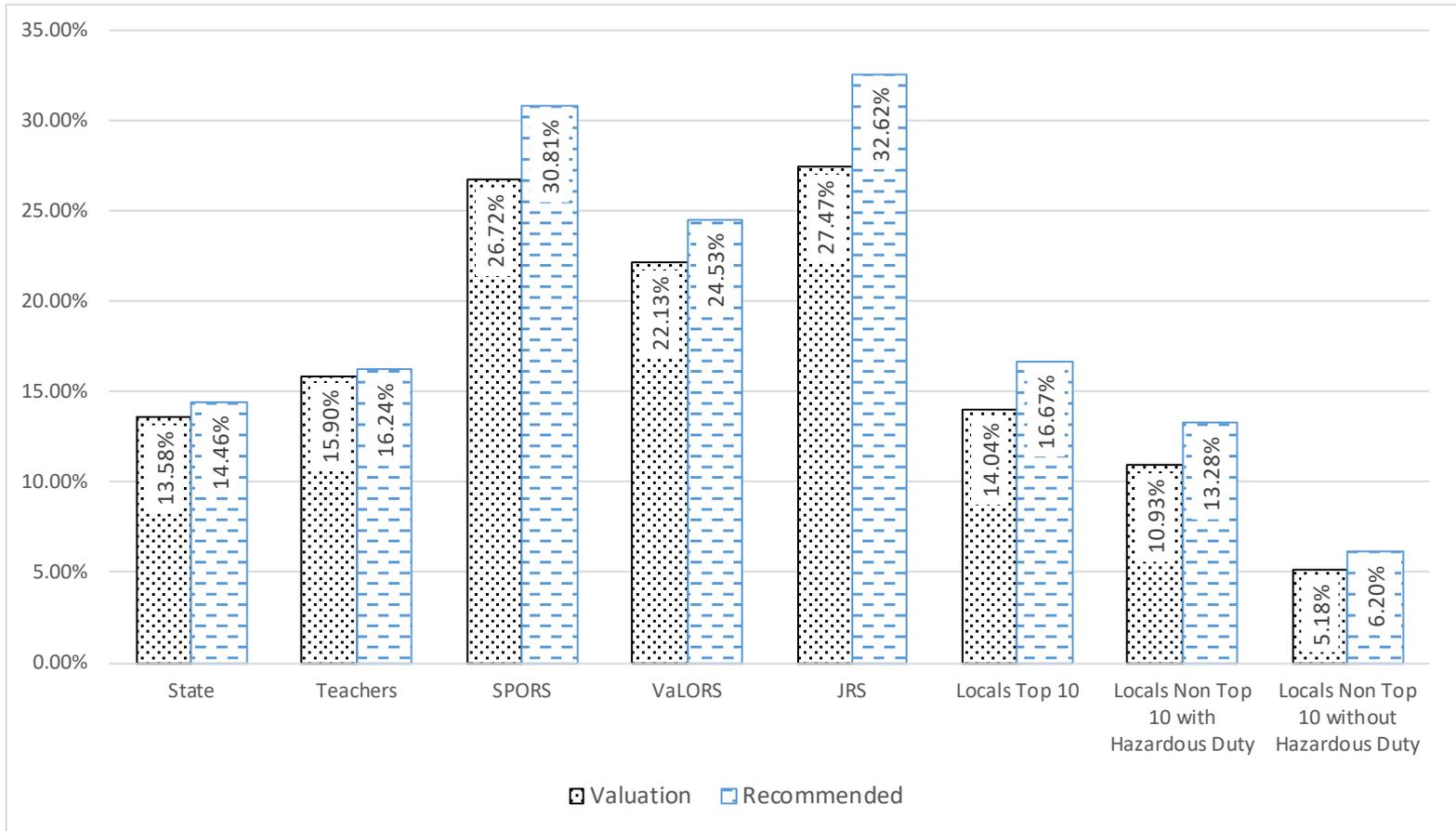


The impact of the recommendations on UAAL was modest compared to pensions with the exception of Group Life Insurance. UAAL for Group Life Insurance decreased due to reflecting longer life expectancies.



Cost Impact

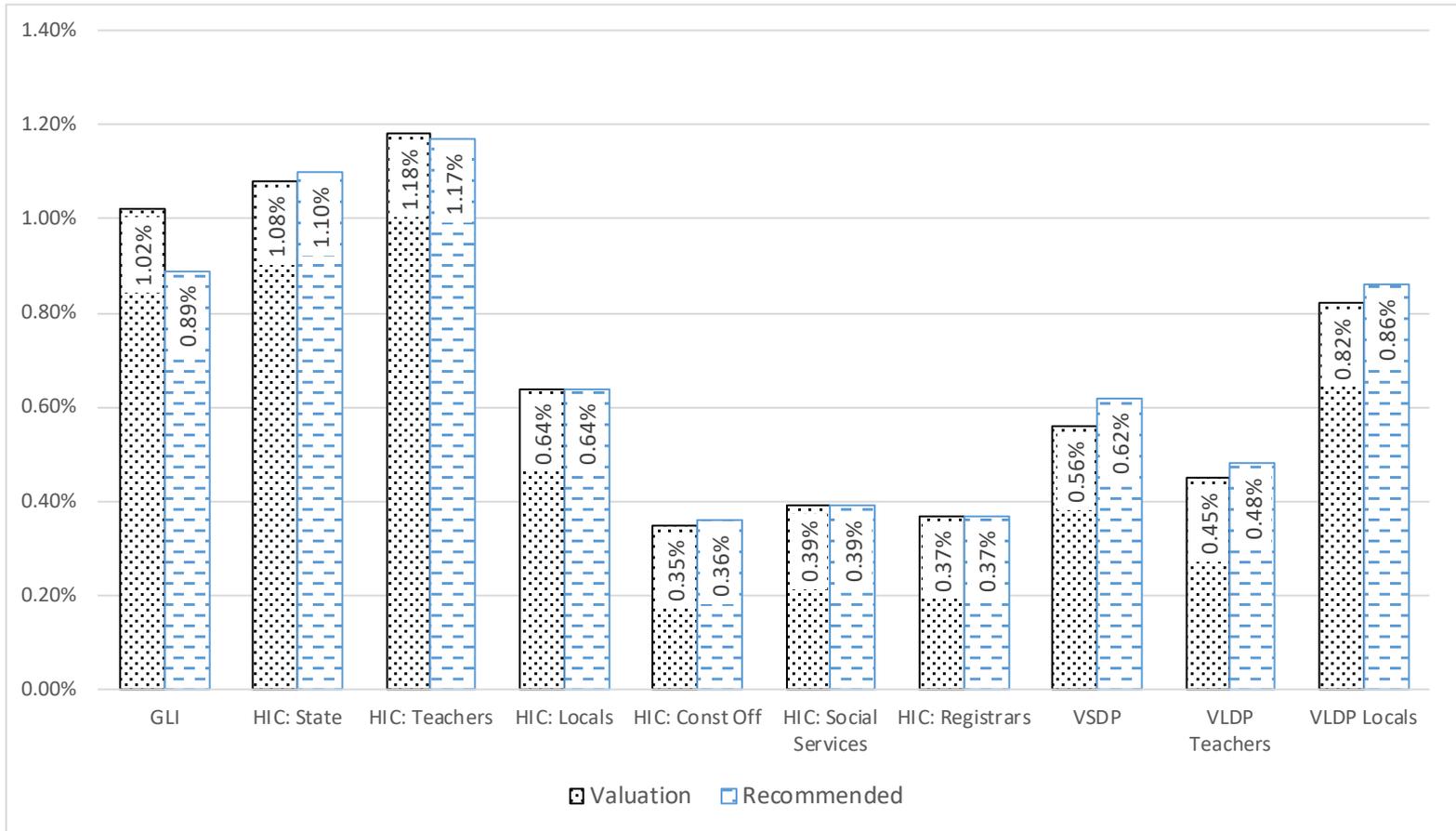
Employer Defined Benefit Contribution Rate Pension Plans



The impact of the mortality recommendation was to increase costs. The impact was not consistent across all plans. In particular, plans which covered judges and Hazardous Duty members incurred larger cost increases. The impact of other assumptions was mixed.



Cost Impact Employer Contribution Rate OPEB Plans



The impact of the recommendations was generally not as pronounced for the OPEB plans, other than LODA which is covered separately.



ECONOMIC ASSUMPTIONS



Economic Assumptions

- Assumptions studied
 - Price inflation
 - Investment rate of return
 - Wage inflation
 - Payroll growth

- Actuarial Standard of Practice (ASOP) No. 27, *“Selection of Economic Assumptions for Measuring Pension Obligations”* provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit plans.



Economic Assumptions

- We recommend no changes in the current economic assumptions except for increasing the LODA discount rate from 4.75% to 6.75%

Item	Assumption
Price Inflation	2.50 %
Real Rate of Return (net)	<u>4.25 %</u>
Investment Return (net of investment expenses)	6.75 %
Retiree Cost-of-Living Adjustment	
Plan 1 Members	2.50 %
All Other Members	2.25 %
Price Inflation	2.50 %
Real Wage Growth	<u>1.00 %</u>
Wage Inflation	3.50 %



Price Inflation

- We recommend maintaining the current 2.50% assumption.

Range of Inflation Assumptions used in the Social Security 75-year Modeling			
Report Year	Low-Cost	Intermediate-Cost	High-Cost
2020	3.00%	2.40%	1.80%
2019	3.20%	2.60%	2.00%
2018	3.20%	2.60%	2.00%
2017	3.20%	2.60%	2.00%
2016	3.20%	2.60%	2.00%



Assumed Investment Rate of Return

- Current Assumption
 - Assumed Rate of Inflation 2.50%
 - Assumed Real rate of return (net) 4.25%
 - Total return (net of investment expenses) 6.75%*

- Rate was reduced to 6.75% for the June 30, 2019 Actuarial Valuations

- Actuarial Standards of Practice caution the actuary not to rely too heavily on actual historical investment returns

- VRS provided Forward Returns Worksheet in February 2021 containing capital market assumptions and policy allocation target weights for the plan assets

* We propose LODA increase from 4.75% to 6.75%.



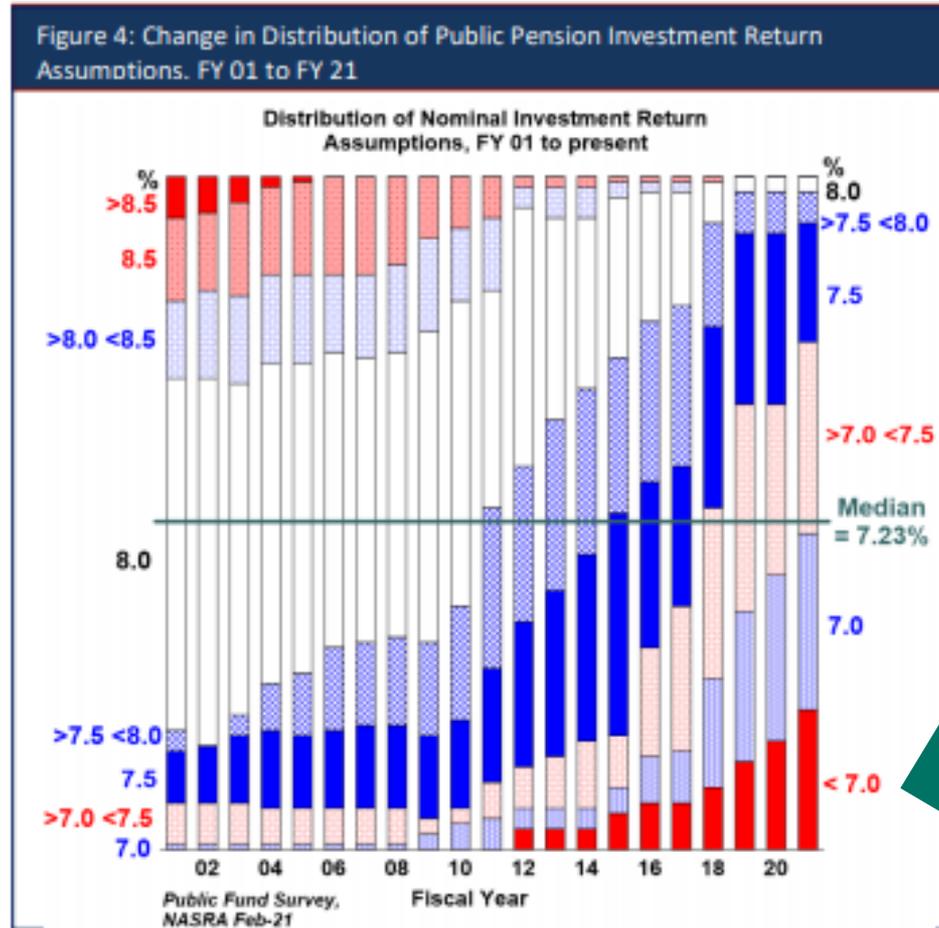
Reasonable Range for Investment Return

- Based on Forward Returns provided by staff, we developed the following real returns
- The 50th percentile real return of 4.30% exceeds the current assumption of 4.25%, which suggests the current assumption is reasonable

Time Span In Years	Mean Real Return	Standard Deviation	Real Returns by Percentile				
			5th	25th	50th	75th	95th
1	4.63%	8.73%	-9.05%	-1.39%	4.30%	10.32%	19.61%
5	4.34%	3.89%	-1.89%	1.71%	4.30%	6.95%	10.89%
10	4.31%	2.75%	-0.12%	2.47%	4.30%	6.17%	8.92%
20	4.29%	1.94%	1.16%	3.00%	4.30%	5.62%	7.54%
30	4.28%	1.59%	1.73%	3.24%	4.30%	5.38%	6.94%
50	4.28%	1.23%	2.30%	3.48%	4.30%	5.13%	6.34%



Historical Change in Distribution of Investment Return Assumptions



VRS - 6.75%



LODA Fund – Discount Rate - GASB

- GASB 74/75 (OPEB plans) and 67/68 (Pension plans) require the discount rate used to value a plan to be based on a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate when the fund is projected to be depleted (Municipal Bond Index Rate).
 - Municipal Bond Index Rate is GASB's proxy for the time value of money of a public sector employer's general assets.
 - On a current disbursement funding basis, the LODA Fund will be projected to be depleted almost immediately. As a result, the LODA Fund's discount rate for accounting disclosure purposes under GASB 74 and 75 will effectively be the Municipal Bond Index Rate.

- The Municipal Bond Index Rate used by CMC for this purpose is the June average of the weekly Bond Buyer General Obligation 20-year Municipal Bond Index rates.



LODA Fund – Discount Rate - Funding

- LODA Fund contributions determined on a current disbursement basis
 - LODA Fund has minimal assets in trust solely to provide benefits that are projected to be depleted every two years
 - LODA Fund is invested in same manner as pension funds
- Background: old accounting standards, GASB 43 and 45
 - Required the discount rate be based on a rate of return assumption that was blended between the long-term rate of return and a short-term rate of return, but no specific methodology was given
 - Most OPEB plans used GASB 43 and 45 liabilities as default funding liabilities
 - LODA current assumption is 4.75% representing blend
- Recommendation: New accounting standards, GASB 74 and 75, separated from funding. For funding and for pay as you go cash flow projections, we recommend that the LODA Fund use 6.75% as the discount rate since the Fund is invested in the same manner as the pension funds



Wage Inflation

- Current assumption: 3.50%
 - Real rates of wage inflation currently assumed to be 1.00% plus price inflation of 2.50%
- The Chief Actuary for Social Security bases the 75-year cost projections on an intermediate national wage growth assumption 1.14% greater than the intermediate cost SSA price inflation assumption of 2.40%.
- The proposed real wage increase of 1.00% per year combined with the proposed price inflation assumption of 2.50% per year results in a recommendation of 3.50% for the wage inflation assumption

Range of Real Wage Growth Assumptions used in the Social Security 75-year modeling			
Report Year	Low-Cost	Intermediate-Cost	High-Cost
2020	1.76%	1.14%	0.52%
2019	1.84%	1.21%	0.60%
2018	1.82%	1.20%	0.58%
2017	1.82%	1.20%	0.58%
2016	1.83%	1.20%	0.58%
2015	1.80%	1.17%	0.55%



FUNDING POLICY



UAAL Payment Increase (Rate of Payroll Growth)



- The UAAL Payment Increase assumption is used in amortizing the unfunded liabilities of the plan. By assuming a steadily increasing payment, the amortization payment is expected to remain level as a percent of pay during the amortization period.
- If covered payroll grows slower than expected, an increase in contribution rates may be required to generate the necessary payment to pay down the unfunded liabilities.
- State and VaLORS plans have shown population decreases in recent years that have contributed to the payroll growth lagging the assumption and increases in contribution rates. Consideration could be given to lowering the UAAL Payment Increase for these plans if it is anticipated payroll will continue to lag the assumption.
- At this time we are not recommending a change in the assumption but suggest that we continue to monitor these plans to determine if the population has stabilized. To the extent that payroll growth lags the current 3% assumption, employer contribution rates will increase.



DEMOGRAPHIC ASSUMPTIONS



Demographic Assumptions

- Study compares what actually happened during the study period (7/1/2016 through 6/30/2020) with what was expected to happen.
- Assumption changes are normally recommended to capture changes in emerging behavior.
- Experience data is only partially credible. Recent experience may not be the best estimate of the future.
- Judgment required to extrapolate future experience from past experience.



Demographic Assumptions

- Assumptions Studied (not an exhaustive list)
 - Post-retirement mortality
 - Pre-retirement mortality
 - Disabled mortality
 - Rates of service retirement
 - Rates of termination
 - Rates of disability retirement
 - Rates of service-related salary increases
 - Percent of disabilities in the Line of Duty
 - Other (e.g. Percent Married, Spousal Age Differential)

- Actuarial Standard of Practice (ASOP) No. 35, *“Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations,”* which provides guidance to actuaries in selecting demographic assumptions for measuring obligations under defined benefit plans.



Mortality

- We recommend changing mortality assumption from a Margin approach on a headcount weighted basis to a Generational Mortality approach on a benefits weighted basis:
 - This recommendation is the primary driver of lower funded status and higher employer contribution rates
 - This recommendation will reduce the likelihood of large increases with future experience studies



Mortality Gain (Loss) Analysis Pension Plans

Post-Retirement Mortality Gain/(Loss)					
(in millions)	2017	2018	2019	2020	Total Gain / (Loss)
State	30.3	33.3	86.6	37.3	187.5
Teachers	(9.5)	34.3	105.0	60.5	190.3
VaLORS	5.4	4.6	4.6	6.3	20.9
SPORS	(1.4)	(4.6)	(1.8)	(4.3)	(12.1)
JRS	(1.4)	(1.4)	(5.8)	0.0	(8.6)
Locals (In Aggregate)	10.0	9.5	14.9	(0.8)	33.6

- Using the Margin approach over the past 4 valuations, VRS experienced consistent mortality gains across the larger plans.
- Given the Margin approach, we would expect gains in the first few years after the assumption is set, and as mortality improves, we would eventually – after several years – observe losses
- If the Margin approach were to be continued, we would study the amount of margin and increase life expectancy even if gains had been observed with each experience study
- On the following slides we look at the impact of implementing the Generational Mortality approach



Mortality Assumption

Current Approach –

Margin for Future Mortality Improvements



- Mortality tables for VRS for the last two experience study periods have been:
 - based on standard mortality tables published by the Society of Actuaries
 - adjusted using various techniques to:
 - provide a better fit
 - reflect expected future mortality improvements
 - involved expecting fewer deaths than the mortality analysis would otherwise suggest
- For example, in the last experience study the mortality tables were “adjusted to produce a 10% to 12% margin over the experience”
- We selected a mortality table that projected fewer deaths than what we observed



Mortality Assumption Proposed Approach – Generational Mortality



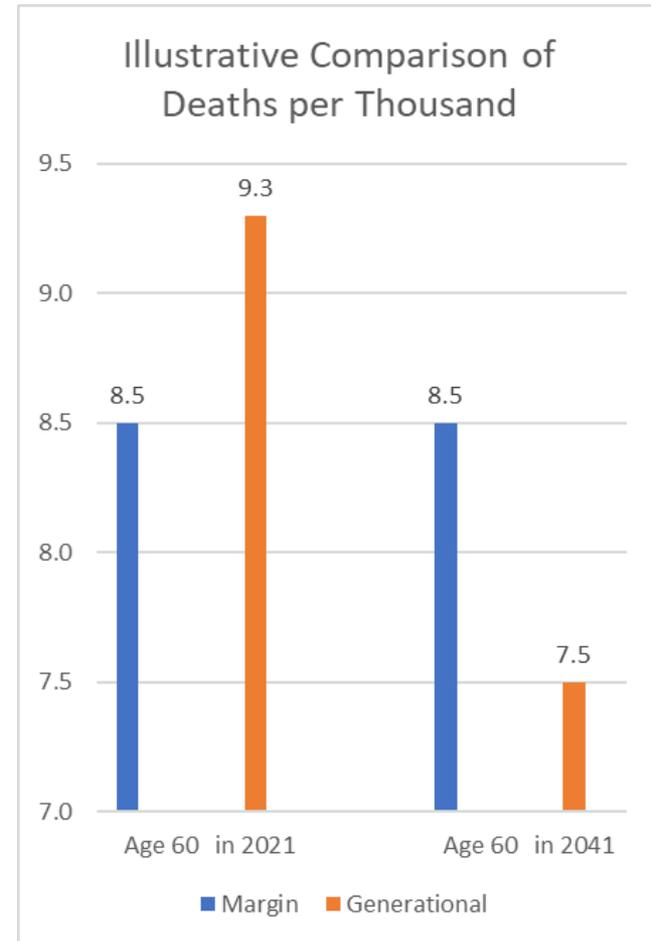
- An alternative approach to the Margin approach is to use Generational Mortality
- Involves 2 steps:
 - 1) Selecting a mortality table:
 - based on standard mortality tables published by the Society of Actuaries
 - adjusted using various techniques to provide a better fit
 - BUT no adjustment for expected future mortality improvements
 - AND
 - 2) Applying a “Mortality Projection” Scale – MP2020 which is an explicit assumption that future generations live longer than current generations



Mortality Assumption Comparison of Approaches: Margin vs Generational Mortality



- For purposes of this illustration, let's assume that based on the mortality table analysis done we would expect 9.3 deaths per thousand 60-year-olds in 2021.
- Under the Margin approach:
 - To provide for margin, we reduce the number of deaths expected downward – here to 8.5 deaths
 - We use the same rate of deaths for all future years
- Under the Generational Mortality approach:
 - We set the number of deaths at 9.3 deaths in 2021 from our mortality analysis
 - We would expect fewer deaths in future years by using a Mortality Projection scale
 - In this example, we estimate 9.3 deaths per thousand in 2021 would reduce to 7.5 deaths per thousand in 2041

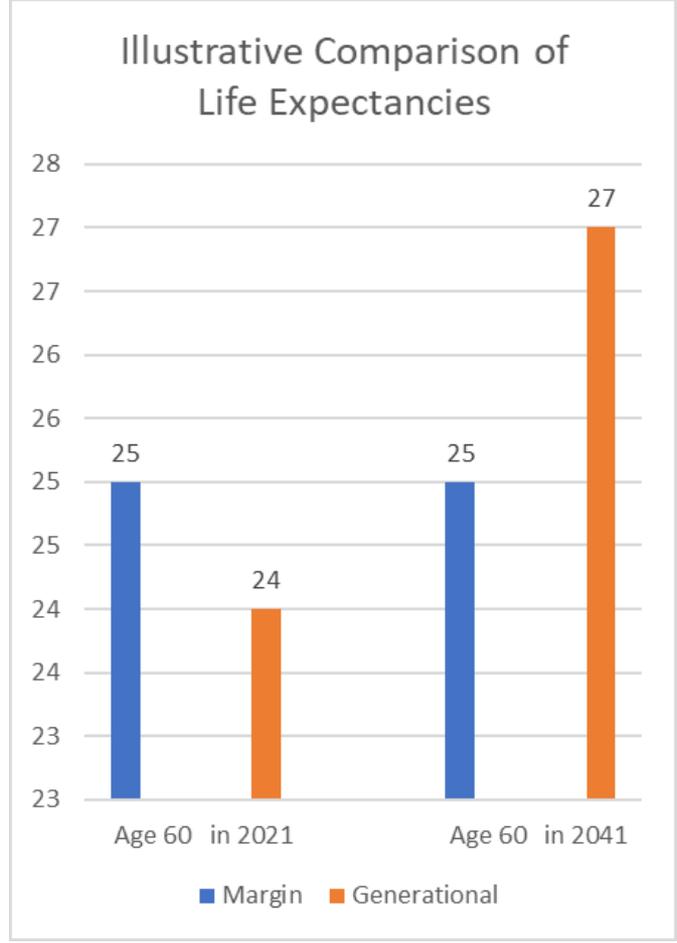




Mortality Assumption Comparison of Approaches: Margin vs Generational Mortality



- Under the Margin approach, life expectancy is “static”. In the example to the right, a person age 60 today or 20 years from today is expected to live 25 more years.
- Under the Generational Mortality approach, life expectancy increases. In the example, life expectancy increases by 3 years over the next 20 years from 24 to 27 years

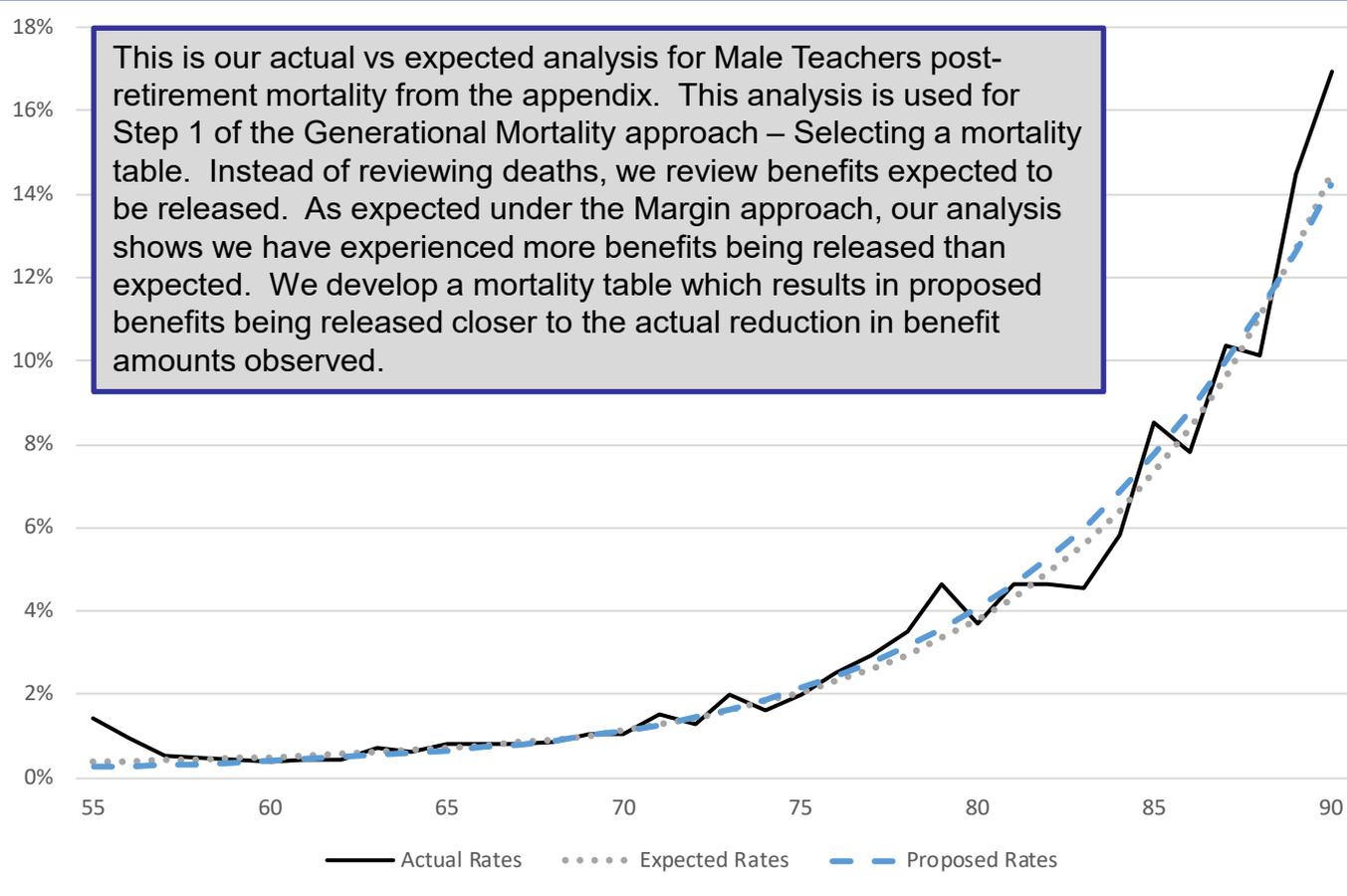
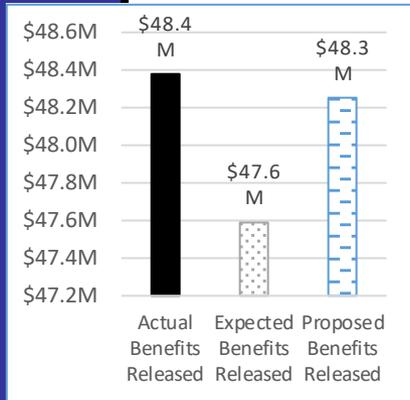




Post-Retirement Mortality Teachers Males



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 White Collar Employee Rates to age 49, White Collar Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; M 1% increase compounded from 70 to 90; F SB 3yr, 1.5% increase compounded from ages 65 to 70, and 2.0% increase

Proposed: Pub2010 Ret - Teachers Males, set forward 1 year, Modified Mortality Improvement Scale MP-2020

Master Page # 43 of 223 - Benefits and Actuarial Committee (B&A) Meeting 4/19/2021



Cost Impact Mortality



	Entry Age Accrued Liability (\$'s in Millions)				
	Valuation	MP-2020	Switch to Pub2010 with MP-2020	Switch to Pub2010 with Modified MP-2020	Switch to Pub2010 with Modified MP-2020 Amt Wtd
Teachers	\$ 50,835	\$ 52,752	\$ 51,440	\$ 51,131	\$ 51,799
VaLORS	2,259	2,349	2,308	2,291	2,330
SPORS	1,206	1,257	1,242	1,233	1,253
State	25,751	26,898	26,004	25,832	26,398
JRS	678	707	738	734	747
Locals - LEO	\$ 8,472	\$ 8,798	\$ 8,722	\$ 8,659	\$ 8,816
Locals - NonLEO	16,835	17,626	17,475	17,348	17,643
Political Subdivisions	\$ 25,307	\$ 26,424	\$ 26,196	\$ 26,006	\$ 26,459

- Step 2 involves Applying a Mortality Projection Scale. We apply a modified MP-2020, which on average increased liabilities by 3.5%.
- Applying the Pub2010 mortality table selected to fit experience without margin from Step 1, the 3.5% increase from applying modified MP-2020 is partially offset.
- Let's revisit our earlier comparison of the Margin and Generational Mortality approaches



Mortality Assumption Comparison of Approaches: Margin vs Generational Mortality

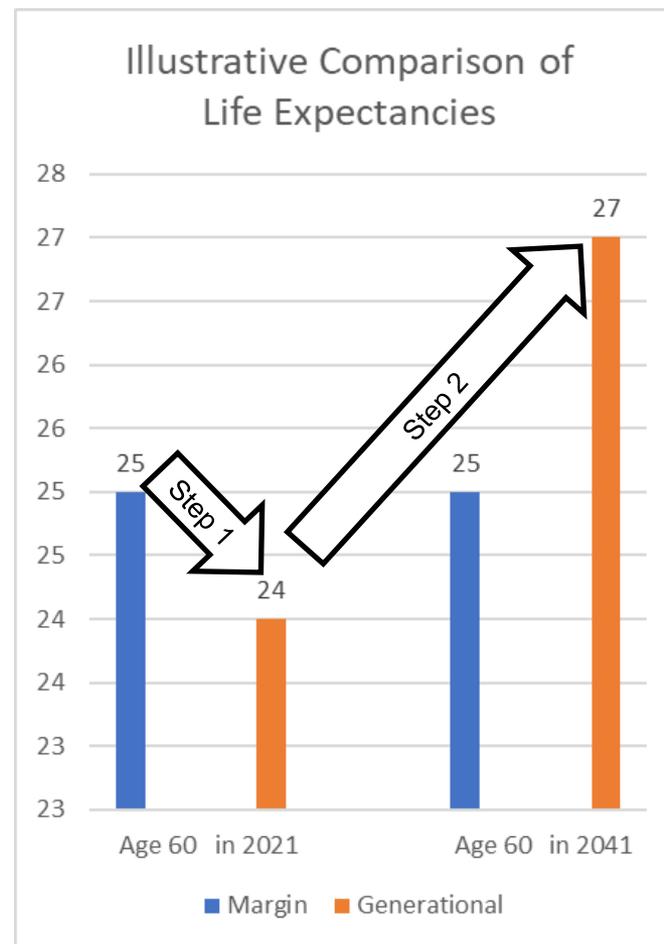


➤ Step 1 – Selecting a table to fit experience without margin

- Illustrated with the reduction in life expectancy from 25 to 24 years
- Reduces costs

➤ Step 2 – Applying the Generational Mortality Scale

- Illustrated with the increase in life expectancy
- Increases costs





Retirement Gain (Loss) Analysis Pension Plans



(in millions)	Retirement Gain/(Loss)				Total Gain / (Loss)
	2017	2018	2019	2020	
State	9.0	(11.0)	(12.3)	(15.1)	(29.4)
Teachers	82.6	71.3	25.3	(6.4)	172.8
VaLORS	(11.6)	(14.5)	(13.8)	(11.1)	(51.0)
SPORS	2.4	0.8	0.0	0.3	3.5
JRS	6.2	5.8	6.8	2.7	21.5
Locals (In Aggregate)	(32.6)	(48.6)	(32.8)	(40.2)	(154.2)

- Retirement experience produced gains in general, in particular for teachers and judges
- Proposed rate adjustments at various ages to anticipate expected future retirements
 - Generally reduced rates of retirement
 - Extend Final Retirement Age (FRA)



Demographic Assumptions - Termination



- Termination assumptions are expectation of members leaving active service **not** due to disability, retirement or death.
- Experience commonly impacted by labor markets and economy
- Current rates produced acceptable Actual / Expected ratios in aggregate



Termination Gain (Loss) Analysis Pension Plans



Termination Gain/(Loss)					Total
(in millions)	2017	2018	2019	2020	Gain / (Loss)
State	(37.3)	(38.0)	(11.7)	(27.3)	(114.3)
Teachers	(116.5)	(107.5)	45.7	(41.9)	(220.2)
VaLORS	1.9	3.4	10.4	6.6	22.3
SPORS	1.2	(0.6)	(0.1)	(0.6)	(0.1)
JRS	0.0	0.0	0.0	(1.1)	(1.1)
Locals (In Aggregate)	2.2	(22.0)	2.4	(4.6)	(22.0)

- Termination experience produced losses over the period generally.
 - Experience suggests fewer employees are terminating than expected. Fewer terminations than expected result in experience losses as seen in the table above.
 - Proposed rate adjustments at various ages to anticipate expected future terminations
 - Generally reduced rates of terminations



Disability Gain (Loss) Analysis Pension Plans



Disability Gain/(Loss)					
(in millions)	2017	2018	2019	2020	Total Gain / (Loss)
State	(2.9)	3.9	6.2	3.0	10.2
Teachers	(1.5)	4.4	11.9	13.5	28.3
VaLORS	(0.6)	0.7	2.0	0.1	2.2
SPORS	(0.8)	(0.6)	(0.4)	(1.1)	(2.9)
JRS	0.7	0.0	0.0	0.0	0.7
Locals (In Aggregate)	(11.4)	2.0	16.8	18.0	25.4

- Disability experience resulted in small losses to SPORS.
- Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore, we used data from the prior experience study as well as the current experience period.
- Using experience over the current and prior period indicates that there were fewer disabilities than expected, creating margin in the rates. We recommend retaining the current rates because we prefer maintaining a margin since the number of incidences is small, but the liability associated with an occurrence can be large.



Service-Related Salary Increase Analysis



- Like inflation and investment return, the salary increase assumption can have significant impact on results
- Assumptions for later stages of a career are tied to our wage inflation assumption which was discussed earlier on Slide 24
- Wage inflation is typically used as a floor for the salary increase assumption
- While recent experience has shown increases less than the current assumption, we recommend caution when considering lowering this assumption at this time
- Proposed State budgets include salary increases for many VRS members which appear above those provided in recent years which could influence future results



Service-Related Salary Increase Analysis



(in millions)	Salary Gain/(Loss)				Total
	2017	2018	2019	2020	Gain / (Loss)
State	150.1	(41.7)	(171.7)	172.6	109.3
Teachers	59.6	265.3	(39.2)	54.6	340.3
VaLORS	17.9	(2.6)	(25.7)	17.6	7.2
SPORS	6.8	(36.0)	(8.6)	11.0	(26.8)
JRS	6.9	2.2	2.3	6.3	17.7
Locals (In Aggregate)	4.5	8.4	(173.3)	(0.8)	(161.2)

- Results were somewhat mixed but overall, there were gains due to salary increases. Past experience also gets limited consideration when setting this assumption
- However, the JRS increase is a flat 4.5% at this time and we would suggest lowering that to 4.0%.

Analysis in Appendix
See Slides 185-193



Method Change - Decrement Timing



- Decrements is the actuarial term for reasons that members leave the active population – encompasses termination, retirement, disability and death
- We have expected decrements to occur at the beginning of the year
- We recommend that decrements occur at mid-year, which is an approximation for throughout the year
- This does not apply to Teacher retirements, which tend to occur near the valuation date
- We have isolated the cost of this change as a Method Change in the cost exhibits



OPEB ASSUMPTIONS



OPEB Assumptions

- Rely heavily on assumptions used for pension plans
 - Investment Rate of Return*
 - Inflation
 - Payroll Growth Rate
 - Mortality
 - Retirement Rates
 - Disability Incidence Rates
 - Termination Rates
 - Salary Increase Rates

*Assumes GLI, LODA, HIC, VSDP, and VLDP assets are invested in the same manner as pension funds.

- The following slides discuss assumptions that only pertain to the OPEB programs



Group Life Insurance Program



- Life Only retirees are retirees whose only available VRS benefit is life insurance through GLI
 - Recommend change to estimation of liability for this group to be based on actual benefit payments for this group compared to actual benefit payments for total group



OPEB Programs

➤ Assumptions Specific to OPEB Benefits

▪ LODA Fund

- Percentage of Deaths and Disabilities Qualifying for Benefits
 - Recommend increasing assumption for most groups. Includes margin for presumptions to be added as well as any future COVID-19 impact on disabilities.

- Percentage of Qualifying Deaths that are a Direct Result of the Performance of Duty
 - Recommend increasing from 42% to 50%.

- Spouse Participation Rates
 - Recommend increasing from 80% of disabilities and 67% of deaths result in spouse coverage to 80% of disabilities and 80% of deaths result in spouse coverage.

- Spouse Age Differences
 - No change – wives 3 years younger.



OPEB Programs

- **LODA Fund**
 - Per Capita Health Care Costs, Including Inflation (Trend)
 - No change – review annually with valuation
 - Administrative Expenses
 - Annual administrative expense assumption recognizes that actual administrative expenses include variable costs, such as opt outs, which are reimbursed.
 - We recommend that we continue to set this assumptions annually based on actual experience regarding administrative expenses and miscellaneous revenue, which includes reimbursements.



OPEB Programs

➤ Assumptions Specific to OPEB Benefits

▪ HIC

- Benefit Election for future eligible retirees
 - Recommend 95% for HIC State and Teachers
 - Recommend 85% for HIC Locals and Special Coverage Codes
- Benefit Utilization
 - Slight reduction in percentage of retirees not utilizing the full benefit for which they are eligible
- Terminated Vested Member Withdrawals & Retirement Age
 - Recommend adjustment to assumed percentage of terminated vested members who do not withdraw and instead become eligible for HIC benefits at retirement. Generally, an increase in assumed percentage if over age 50 at termination and decrease if under age 50.
 - No change to assumed retirement age
- ORP/UVA – Actual retiree data is available and utilized. An adjustment factor will continue to be utilized for termed vested members since that data is not available.



OPEB Programs



- **VSDP/VLDP***
 - LTD
 - Benefit offsets
 - Adjustments made to assumption for future benefit offsets
 - Rates of disability claim termination due to death or recovery
 - Adjustment made to rates based on recent experience
 - Catastrophic Claims
 - LTD income replacement benefits are 80% instead of 60% if disability is determined to be catastrophic
 - Recommend average income replacement be increased from 61% to 62%
 - VLDP defined contribution benefit utilization
 - Assumed percentage meeting Social Security definition of disability and therefore eligible for 1% employer contribution decreased from 70.5% to 65%

*Until 4/19/2021, OPEB benefits and actuarial calculations (BOA) were based on assumptions and methods used in the actuarial valuation of the VSDP benefit.



OPEB Programs

■ VSDP/VLDP*

○ LTC

– Morbidity, Claim incidence, Porting rates

- Analysis of actual experience versus expected experience over the 4-year study period shows higher assumed morbidity, claims incidence and porting rates than those actually experienced.
- This is preferable when predicting future occurrences of a benefit whose incidence rates are small, but the liability associated with an incidence can be large.
- We recommend making no change to these rates.

– Porting premiums

- Current porting premiums were found to be sufficient to cover benefit costs for ported members, so no change is recommended in these rates.

*Until adequate experience emerges, most VLDP calculations are based upon the actuarial assumptions and methods used in the actuarial valuation of the VSDP benefit.



COST IMPACT



Cost Impact Virginia Retirement System State



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)				
	Funded Ratio	Unfunded Liability	Normal Cost	DB Employer Contribution Rate
Valuation Results	75.1 %	\$ 6,418	\$ 379	13.58 %
Impact of following recommendations:				
Mortality	(1.9)	647	15	1.39
Retirement	0.3	(126)	(3)	(0.33)
Other assumptions	0.2	(80)	(15)	(0.47)
Methods	0.2	(68)	16	0.28
Total Impact (not additive)	(1.1)	373	13	0.88
Results Based on Recommendations	74.0 %	\$ 6,791	\$ 392	14.46 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The overall impact of other recommendations, in particular later retirements, helped partially offset the impact of mortality.



Cost Impact Virginia Retirement System Teachers



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)				
	Funded Ratio	Unfunded Liability	Normal Cost	DB Employer Contribution Rate
Valuation Results	73.9 %	\$ 13,279	\$ 889	15.90 %
Impact of following recommendations:				
Mortality	(1.4)	964	25	1.08
Retirement	0.4	(257)	(24)	(0.48)
Other assumptions	(0.1)	46	(36)	(0.30)
Methods	0.0	0	0	0.00
Total Impact (not additive)	(1.2)	826	(34)	0.34
Results Based on Recommendations	72.7 %	\$ 14,105	\$ 855	16.24 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The overall impact of other recommendations partially offset the increase in contribution and resulted in no overall change in employer contribution rate.



Cost Impact

State Police Officers' Retirement System

Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)							
	Funded Ratio		Unfunded Liability		Normal Cost		DB Employer Contribution Rate
Valuation Results	73.0 %	\$	326	\$	21		26.72 %
Impact of following recommendations:							
Mortality	(2.7)		46		1		3.44
Retirement	(0.7)		11		0		1.01
Other assumptions	(0.1)		1		(1)		(0.07)
Methods	0.3		(5)		0		(0.17)
Total Impact (not additive)	(3.1)		53		1		4.09
Results Based on Recommendations	69.9 %	\$	379	\$	22		30.81 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The impact of disabled mortality tables increased cost further. Projected impact of earlier retirements increased costs as well. Other recommendations had minimal impact.



Cost Impact

Virginia Law Officers' Retirement System

Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)				
	Funded Ratio	Unfunded Liability	Normal Cost	DB Employer Contribution Rate
Valuation Results	68.5 %	\$ 712	\$ 45	22.13 %
Impact of following recommendations:				
Mortality	(2.1)	71	4	2.76
Retirement	0.0	(2)	0	(0.05)
Other assumptions	0.1	(4)	(5)	(1.12)
Methods	0.1	(4)	2	0.71
Total Impact (not additive)	(1.8)	59	2	2.40
Results Based on Recommendations	66.7 %	\$ 771	\$ 47	24.53 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The impact of disabled mortality tables increased cost further. Projected impact of more terminations partially offset the increases.



Cost Impact Judicial Retirement System

Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)							
	Funded Ratio		Unfunded Liability		Normal Cost		DB Employer Contribution Rate
Valuation Results	83.5 %	\$	112	\$	18		27.47 %
Impact of following recommendations:							
Mortality	(7.7)		69		2		9.26
Retirement	2.1		(17)		(1)		(3.25)
Other assumptions	0.0		0		0		(0.57)
Methods	0.4		(4)		0		(0.12)
Total Impact (not additive)	(5.6)		49		1		5.15
Results Based on Recommendations	77.9 %	\$	161	\$	19		32.62 %

The update to PUB2010 public sector mortality tables specific to JRS and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The overall impact of other recommendations, in particular later retirements and lower projected salaries, helped partially offset the impact of mortality.



Summary of Local Pension Plans

Top 10 Hazardous Duty & Non- Hazardous Duty	Non Top 10
City of Virginia Beach	Total Localities – 619
Henrico County	With Hazardous Duty Coverage – 230
Prince William County	Without Hazardous Duty Coverage – 389
Chesterfield County	With no active employees - 23
City of Chesapeake	
City of Alexandria	
City of Hampton	
Loudoun County	
City of Lynchburg	
City of Portsmouth	



Cost Impact Political Subdivisions - Top 10



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)				
	Funded Ratio	Unfunded Liability	Normal Cost	DB Employer Contribution Rate
Valuation Results	81.9 %	\$ 1,918	\$ 228	14.04 %
Impact of following recommendations:				
Mortality	(3.6)	483	12	2.41
Retirement	0.4	(48)	(1)	(0.28)
Other assumptions	(0.1)	8	4	0.31
Methods	0.2	(28)	5	0.17
Total Impact (not additive)	(3.0)	406	20	2.63
Results Based on Recommendations	78.9 %	\$ 2,324	\$ 248	16.67 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The impact of disabled mortality tables increased cost further. Projected impact of later retirements partially offset the increase caused by changes in the mortality assumption.



Cost Impact Political Subdivisions - Non Top 10 with Hazardous Duty



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)							
	Funded Ratio		Unfunded Liability		Normal Cost		DB Employer Contribution Rate
Valuation Results	87.4 %	\$	1,222	\$	241		10.93 %
Impact of following recommendations:							
Mortality	(3.6)		430		11		1.98
Retirement	0.4		(40)		0		(0.20)
Other assumptions	0.1		(10)		2		0.21
Methods	0.3		(26)		8		0.32
Total Impact (not additive)	(2.9)		344		22		2.35
Results Based on Recommendations	84.5 %	\$	1,566	\$	263		13.28 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. The impact of disabled mortality tables increased cost further. Other changes had limited effect.



Cost Impact

Political Subdivisions - Non Top 10 without Hazardous Duty



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)							
	Funded Ratio		Unfunded Liability		Normal Cost		DB Employer Contribution Rate
Valuation Results	94.0 %	\$	297	\$	105		5.18 %
Impact of following recommendations:							
Mortality	(4.3)		239		5		1.70
Retirement	1.1		(57)		(2)		(0.53)
Other assumptions	0.4		(20)		(8)		(0.57)
Methods	0.2		(7)		5		0.39
Total Impact (not additive)	(2.7)		148		1		1.02
Results Based on Recommendations	91.3 %	\$	445	\$	106		6.20 %

The update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in higher liabilities and employer contribution rates. Projected impact of later retirements and more terminations partially offset the increase caused by changes in the mortality assumption.



Cost Impact Group Life Insurance Program

Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)				
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate*
Valuation Results	53.2 %	\$ 1,677.9	\$ 90.8	1.02 %
Impact of following recommendations:				
Mortality	2.7	(173.2)	(8.3)	(0.11)
Retirement	0.1	(8.6)	(0.1)	0.00
Other assumptions	0.2	(12.2)	(4.9)	(0.03)
Methods	(0.1)	7.8	0.7	0.00
Life Only Retiree Liability Assumption	(0.4)	25.6	0.0	0.01
Total Impact (not additive)	2.5	(160.6)	(12.6)	(0.13)
Results Based on Recommendations	55.7 %	\$ 1,517.3	\$ 78.2	0.89 %

* Contribution rate excludes 0.34% adjustment for Active Group Life Insurance.
For life insurance benefits, unlike a pension annuity payable for life, the update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in lower liabilities and employer contribution rates. An update to our assumption for valuing Life Only retirees resulted in a small increase in liabilities and employer contribution rates.



Cost Impact Health Insurance Credit State



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)							
	Funded Ratio		Unfunded Liability		Normal Cost		Employer Contribution Rate
Valuation Results	12.7 %	\$	894.5	\$	19.1		1.08 %
Impact of following recommendations:							
Mortality	(0.3)		23.4		0.6		0.04
Retirement	0.1		(5.8)		0.0		0.00
Other assumptions	0.0		(3.9)		(0.8)		(0.02)
Methods	0.1		(5.5)		(0.1)		(0.01)
Percentage Not Utilizing Max Service Retirees	0.0		2.1		0.1		0.01
from TVs Utilization	(0.1)		1.7		0.1		0.00
First Year Benefit Increase	0.0		(0.5)		0.0		0.00
VaLORS/SPORS:							
Disabled Participation	0.0		0.0		0.0		0.00
Future VTs Refund	0.0		0.1		0.0		0.00
Total Impact (not additive)	(0.2)		11.6		(0.1)		0.02
Results Based on Recommendations	12.5 %	\$	906.1	\$	19.0		1.10 %

Similar to the pension plan, the assumption for mortality improvement was offset by other decremental and method changes. The OPEB specific assumptions did not have a significant impact on liabilities and employer contribution rates.



Cost Impact Health Insurance Credit Teachers



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)				
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate
Valuation Results	10.5 %	\$ 1,280.6	\$ 20.3	1.18 %
Impact of following recommendations:				
Mortality	(0.2)	18.7	0.5	0.02
Retirement	0.0	2.0	(0.2)	0.00
Other assumptions	0.1	(11.4)	(2.3)	(0.03)
Methods	0.0	0.0	0.0	0.00
Percentage Not Utilizing Max Service Retirees	0.0	2.8	0.1	0.00
from TVs Utilization	0.0	5.2	0.2	0.01
First Year Benefit Increase	0.0	(0.8)	0.0	0.00
VaLORS/SPORS:				
Disabled Participation	0.0	0.0	0.0	0.00
Future VTs Refund	0.0	(4.1)	(0.5)	(0.01)
Total Impact (not additive)	(0.1)	12.4	(2.2)	(0.01)
Results Based on Recommendations	10.4 %	\$ 1,293.0	\$ 18.1	1.17 %

Similar to the pension plan, the assumption for mortality improvement was offset by other decremental and method changes. The OPEB specific assumptions offset each other and did not have a significant impact on liabilities and employer contribution rates.



Cost Impact

Health Insurance Credit

Political Subdivisions



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate	
Valuation Results	31.9 %	\$ 52.2	\$ 1.4	0.64 %	
Impact of following recommendations:					
Mortality	(1.1)	2.7	0.1	0.02	
Retirement	0.2	(0.5)	0.0	(0.01)	
Other assumptions	0.1	(0.1)	(0.1)	0.00	
Methods	0.1	(0.4)	0.0	0.00	
Percentage Not Utilizing Max Service Retirees	(0.1)	0.2	0.0	0.00	
from TVs Utilization	0.1	0.0	0.0	0.00	
First Year Benefit Increase	0.0	0.0	0.0	0.00	
Disabled Participation	(0.1)	0.0	0.0	0.00	
Future VTs Refund	0.2	(0.3)	0.0	(0.01)	
 Total Impact (not additive)	 (0.6)	 1.6	 0.0	 0.00	
Results Based on Recommendations	31.3 %	\$ 53.8	\$ 1.4	0.64 %	

Similar to the pension plan, the assumption for mortality improvement was offset by other decremental and method changes. The OPEB specific assumptions did not have a significant impact on liabilities and employer contribution rates.



Cost Impact

Health Insurance Credit

Constitutional Officers



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate	
Valuation Results	15.9 %	\$ 27.1	\$ 0.7	0.35 %	
Impact of following recommendations:					
Mortality	(0.5)	0.9	0.1	0.02	
Retirement	0.1	(0.1)	0.0	0.00	
Other assumptions	0.0	0.0	0.0	0.00	
Methods	0.1	(0.3)	0.0	0.00	
Percentage Not Utilizing Max Service Retirees	0.0	0.1	0.0	0.00	
from TVs Utilization	0.0	0.0	0.0	0.00	
First Year Benefit Increase	0.0	0.0	0.0	0.00	
Disabled Participation	0.0	0.0	0.0	0.00	
Future VTs Refund	0.1	(0.1)	0.0	(0.01)	
 Total Impact (not additive)	 (0.2)	 0.5	 0.1	 0.01	
Results Based on Recommendations	15.7 %	\$ 27.6	\$ 0.8	0.36 %	

Similar to the pension plan, the assumption for mortality improvement was offset by other decremental and method changes. The OPEB specific assumptions did not have a significant impact on liabilities and employer contribution rates.



Cost Impact

Health Insurance Credit

Social Services



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate	
Valuation Results	13.3 %	\$ 12.6	\$ 0.3	0.39 %	
Impact of following recommendations:					
Mortality	(0.4)	0.5	0.0	0.01	
Retirement	0.0	(0.1)	0.0	0.00	
Other assumptions	0.1	0.0	0.0	(0.01)	
Methods	0.0	(0.1)	0.0	0.00	
Percentage Not Utilizing Max Service Retirees	0.0	0.0	0.0	0.00	
from TVs Utilization	0.0	0.0	0.0	0.00	
First Year Benefit Increase	0.0	0.0	0.0	0.00	
Disabled Participation	0.0	0.0	0.0	0.00	
Future VTs Refund	0.1	0.0	0.0	0.00	
 Total Impact (not additive)	 (0.2)	 0.3	 0.0	 0.00	
Results Based on Recommendations	13.1 %	\$ 12.9	\$ 0.3	0.39 %	

Similar to the pension plan, the assumption for mortality improvement was offset by other decremental and method changes. The OPEB specific assumptions did not have a significant impact on liabilities and employer contribution rates.



Cost Impact Health Insurance Credit Registrars



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate	
Valuation Results	21.9 %	\$ 0.4	\$ 0.0	0.37 %	
Impact of following recommendations:					
Mortality	(0.6)	0.1	0.0	0.02	
Retirement	0.2	0.0	0.0	(0.01)	
Other assumptions	0.1	0.0	0.0	0.00	
Methods	0.1	0.0	0.0	(0.01)	
Percentage Not Utilizing Max Service Retirees	(0.1)	0.0	0.0	0.01	
from TVs Utilization	0.0	0.0	0.0	0.00	
First Year Benefit Increase	0.1	0.0	0.0	0.00	
Disabled Participation	(0.1)	0.0	0.0	0.00	
Future VTs Refund	0.1	0.0	0.0	(0.01)	
 Total Impact (not additive)	 (0.2)	 0.1	 0.0	 0.00	
Results Based on Recommendations	21.7 %	\$ 0.5	\$ 0.0	0.37 %	

Similar to the pension plan, the assumption for mortality improvement was offset by other decremental and method changes. The OPEB specific assumptions did not have a significant impact on liabilities and employer contribution rates.



Cost Impact VSDP

Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate	
Valuation Results	203.01 %	\$ (256.4)	\$ 30.6	0.56 %	
Impact of following recommendations:					
Mortality	(5.10)	6.4	0.6	0.02	
Retirement	0.90	(1.2)	0.0	0.00	
Other Assumptions	1.40	(1.8)	(0.2)	(0.01)	
Methods	8.43	(10.2)	(0.4)	(0.02)	
Rates of Termination					
due to Recovery or Death	0.36	(0.4)	0.6	0.01	
Offsets for Active Members	(2.00)	2.3	1.7	0.05	
Offsets for Disabled Members	(0.19)	0.2	0.0	0.00	
Catastrophic Claims	(0.55)	0.7	0.5	0.01	
Total Impact (not additive)	3.25	(3.9)	2.7	0.06	
Results Based on Recommendations	206.26 %	\$ (260.3)	\$ 33.3	0.62 %	

For VSDP benefits, which provide partial salary continuation until death, recovery or retirement, the update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in slightly higher liabilities and employer contribution rates. The impact is less than for pension benefits which are payable for life. Other decremental and method changes offset the mortality costs. Changes to assumptions regarding benefit offsets, termination from disability and catastrophic claims resulted in slight increases to costs.



Cost Impact VLDP Teachers



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio	Unfunded Liability	Normal Cost	Employer Contribution Rate	
Valuation Results	89.20 %	\$ 0.36	\$ 1.28	0.45 %	
Impact of following recommendations:					
Mortality	(1.96)	0.08	0.05	0.01	
Retirement	(1.44)	0.06	0.01	0.00	
Other Assumptions	2.42	(0.10)	(0.04)	0.00	
Methods	0.00	0.00	0.00	0.00	
Rates of Termination					
due to Recovery or Death	(0.70)	0.03	0.02	0.00	
Offsets for Active Members	(2.91)	0.12	0.05	0.01	
Offsets for Disabled Members	0.00	0.00	0.00	0.00	
Catastrophic Claims	(0.76)	0.03	0.01	0.01	
Percentage Eligible for Additional 1% DC	0.07	0.00	0.00	0.00	
Total Impact (not additive)	(5.29)	0.21	0.11	0.03	
Results Based on Recommendations	83.91 %	\$ 0.57	\$ 1.38	0.48 %	

For VLDP benefits, which provide partial salary continuation until death, recovery or retirement, the update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in slightly higher liabilities and employer contribution rates. The impact is less than for pension benefits which are payable for life. Incremental changes other than retirements offset the mortality costs. Changes to assumptions regarding benefit offsets, termination from disability and catastrophic claims resulted in slight increases to costs.



Cost Impact VLDP Political Subdivisions



Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)					
	Funded Ratio		Unfunded Liability	Normal Cost	Employer Contribution Rate
Valuation Results	91.28 %	\$	0.33	\$ 1.71	0.82 %
Impact of following recommendations:					
Mortality	(2.02)		0.09	0.08	0.03
Retirement	0.49		(0.02)	(0.01)	(0.01)
Other Assumptions	4.57		(0.19)	(0.07)	0.00
Methods	7.64		(0.27)	0.01	(0.01)
Rates of Termination					
due to Recovery or Death	(0.18)		0.01	0.01	0.00
Offsets for Active Members	(1.49)		0.05	0.08	0.03
Offsets for Disabled Members	(0.12)		0.00	0.00	0.00
Catastrophic Claims	(0.41)		0.01	0.02	0.00
Percentage Eligible for Additional 1% DC	0.06		0.00	0.00	0.00
Total Impact (not additive)	8.54		(0.32)	0.12	0.04
Results Based on Recommendations	99.83 %	\$	0.01	\$ 1.82	0.86 %

For VLDP benefits, which provide partial salary continuation until death, recovery or retirement, the update to PUB2010 public sector mortality tables and replacing the load with a modified Mortality Improvement Scale MP-2020 resulted in slightly higher liabilities and employer contribution rates. The impact is less than for pension benefits which are payable for life. Other decremental and method changes offset the mortality costs. Changes to assumptions regarding benefit offsets, termination from disability and catastrophic claims resulted in slight increases to costs.



Cost Impact Line of Duty Act Fund (LODA)

Impact of Recommendations on Results of the June 30, 2020 Actuarial Valuation (Dollar Amounts in Millions)						
	Funded Ratio		Unfunded Liability		Normal Cost	FY 2022 & FY 2023 Contribution Rate (per FTE)*
Valuation Results	1.47 %	\$	291.1	\$	14.0	\$ 758.03
Impact of following recommendations:						
Mortality, Retirement						
Termination and Methods	0.01		(1.7)		1.0	(30.54)
LODA Specific Assumptions	(0.06)		11.8		10.4	70.78
Discount Rate (4.75% -> 6.75%)	0.31		(54.3)		(6.7)	(15.13)
Total Impact (not additive)	0.25		(44.2)		4.7	25.11
Results Based on Recommendations	1.72 %	\$	246.9	\$	18.7	\$ 783.14

*Rates are Informational.

The increase in the discount rate resulted in a lower liabilities, but had less impact on the pay-as-you-go employer contribution rate since the assets are projected to be depleted in 2 years in the pay as you go calculation. The LODA specific assumptions resulted in an increase to the liabilities and the pay-as-you-go employer contribution rate because they generally increased the number of active deaths and disabilities assumed to be eligible for LODA benefits. These increases were somewhat offset by the decremental assumption changes.



Cost Impact Pension Plans

System		Before	After	Change
		Assumption/Method Changes	Assumption/Method Changes	
State	Unfunded Accrued Liability	\$ 6,418	\$ 6,791	\$ 374
	Funded Status	75.08%	74.00%	(1.08%)
	DB Employer Contribution Rate	13.58%	14.46%	0.88%
Teachers	Unfunded Accrued Liability	\$ 13,279	\$ 14,105	\$ 826
	Funded Status	73.88%	72.70%	(1.18%)
	DB Employer Contribution Rate	15.90%	16.24%	0.34%
SPORS	Unfunded Accrued Liability	\$ 326	\$ 379	\$ 53
	Funded Status	73.01%	69.94%	(3.07%)
	DB Employer Contribution Rate	26.72%	30.81%	4.09%
VaLORS	Unfunded Accrued Liability	\$ 712	\$ 771	\$ 59
	Funded Status	68.47%	66.72%	(1.75%)
	DB Employer Contribution Rate	22.13%	24.53%	2.40%
Judicial	Unfunded Accrued Liability	\$ 112	\$ 161	\$ 49
	Funded Status	83.53%	77.90%	(5.63%)
	DB Employer Contribution Rate	27.47%	32.62%	5.15%
Locals Top 10	Unfunded Accrued Liability	\$ 1,918	\$ 2,324	\$ 406
	Funded Status	81.90%	78.87%	(3.03%)
	DB Employer Contribution Rate	14.04%	16.67%	2.63%
Locals Non Top 10 With Hazardous Duty	Unfunded Accrued Liability	\$ 1,222	\$ 1,566	\$ 344
	Funded Status	87.45%	84.47%	(2.98%)
	DB Employer Contribution Rate	10.93%	13.28%	2.35%
Locals Non Top 10 Without Hazardous Duty	Unfunded Accrued Liability	\$ 297	\$ 445	\$ 148
	Funded Status	94.03%	91.32%	(2.71%)
Hazardous Duty	DB Employer Contribution Rate	5.18%	6.20%	1.02%



Next Steps

- Adopt the recommendations
- Implement for the June 30, 2021 actuarial valuations
- Approximate the normal cost for PPS
- Review the optional forms of payment and early retirement factors
- Review HIC funding methods with benefit payments as a minimum



APPENDIX



Summary of Demographic Assumptions State, Teachers, SPORS, VaLORS and JRS



System	Assumption	Description
State	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each year age and service through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
Teachers	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each year age and service through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
SPORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Increased rates for ages 55 to 61, 63, and 64 with 26 or more years of service; changed final retirement age from 65 to 70
	3. Withdrawal Rates	Decreased rate for 0 years of service and increased rates for 1 to 6 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
VaLORS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Increased rates at some younger ages, decreased at age 62, and changed final retirement age from 65 to 70
	3. Withdrawal Rates	Adjusted rates to better fit experience at each year age and service through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
JRS	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Review separately from State employees because exhibit fewer deaths. Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Decreased rates for ages 60-66 and 70-72
	3. Withdrawal Rates	No change
	4. Disability Rates	No change
	5. Salary Increases	Reduce increases across all ages by 0.50%



Summary of Demographic Assumptions Locals



System	Assumption	Description
Locals Largest 10 (Non-Hazardous Duty)	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each year age and service through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
Locals Largest 10 (Hazardous Duty)	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience and changed final retirement age from 65 to 70
	3. Withdrawal Rates	Decreased rates
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
Locals Non10 Largest (Non-Hazardous Duty)	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience for Plan 1; set separate rates based on experience for Plan 2/Hybrid; changed final retirement age from 75 to 80 for all
	3. Withdrawal Rates	Adjusted rates to better fit experience at each year age and service through 9 years of service
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change
Locals Non10 Largest (Hazardous Duty)	1. Mortality Rates (Pre-retirement, post-retirement healthy and disabled)	Update to PUB2010 public sector mortality tables. Increased disability life expectancy. For future mortality improvements, replace load with a modified Mortality Improvement Scale MP-2020.
	2. Retirement Rates	Adjusted rates to better fit experience and changed final retirement age from 65 to 70
	3. Withdrawal Rates	Decreased rates and changed from rates based on age and service to rates based on service only to better fit experience and to be more consistent with Locals Largest 10 Hazardous Duty
	4. Disability Rates	No change
	5. Salary Increases	No change
	6. Line of Duty Disability	No change



Summary of Assumption Changes GLI, LODA, HIC, and VSDP/VLDP



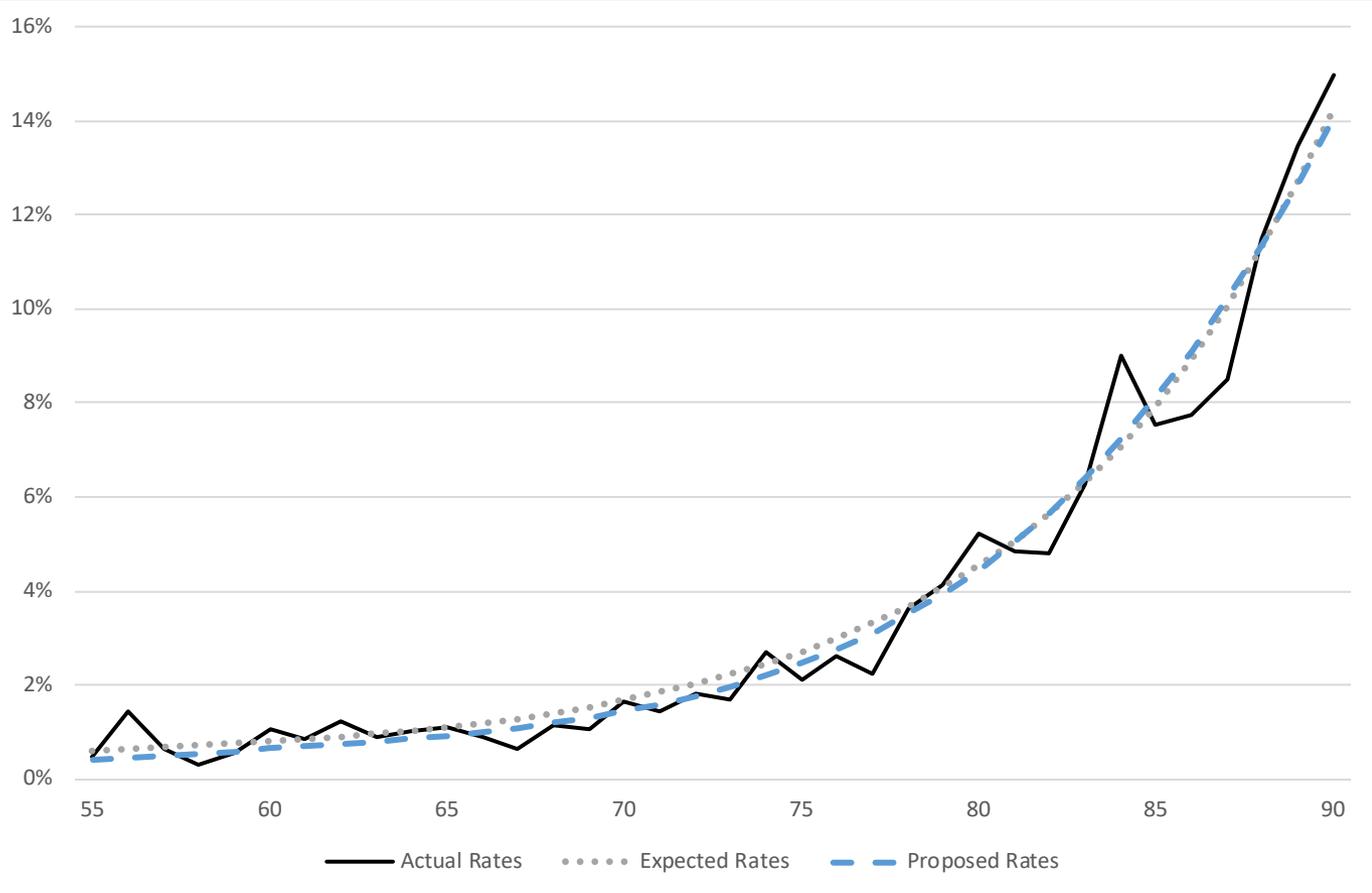
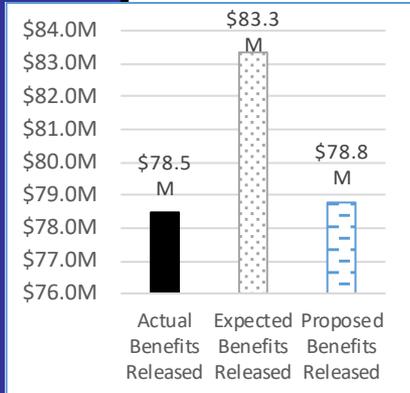
System	Assumption	Description
GLI	1. Pension economic and demographic assumptions	Adjusted in the same manner as the pension plans
	2. Retiree liability estimation for Life Only	Adjusted to estimate based on actual benefit payments for this group compared to actual benefit payments for total group
LODA	1. Pension wage, inflation and demographic assumptions	Adjusted in the same manner as the pension plans
	2. Discount rate for funding	Adjusted to match pension discount rate
	3. Percentage of disabilities qualifying for benefits	Increased to add margin for presumptions and COVID-19.
	4. Percentage of qualifying deaths that are a direct result of the performance of duty	Increased to 50%
	5. Spouse participation rates	Increased to 80% of disabilities and 80% of deaths result in spouse coverage
HIC	1. Pension economic and demographic assumptions	Adjusted in the same manner as the pension plan
	2. Benefit election (from deferred vested)	Adjusted election from deferred vested status to a flat 95% for State & Teachers and a flat 85% for Locals & Special Coverage Codes
	3. Benefit election (from disability)	Adjusted election to 80% for SPORS/VaLORS and 50% for Locals and Special Coverage Codes
	4. Benefit utilization	Increase in utilization for all groups
	5. Percentage of deferred vested members electing to withdraw from VRS	Bifurcated assumption for above or below 50 years of age; in general, withdrawal rate increased for those below 50 and decreased for those below 50
	6. Benefit increase in the first year	Reduction to 4.50% for all groups
VSDP / VLDP LTD	1. Pension economic and demographic assumptions	Adjusted in the same manner as the pension plans
	2. Rates of disability claim termination	Adjusted for credible VSDP experience
	3. Benefit offsets	Increased to match experience and extend period in which offset may be received
	4. Catastrophic claims	Increased to match experience
	5. Percentage eligible for additional 1% defined contribution	Reduction in number assumed to meet Social Security definition of disability



Post-Retirement Mortality State Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent State experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; MSF 1yr; F SB 1yr, 1.5% compounding increase from ages 70 to 85
 Proposed: Pub2010 Ret - General Males, Modified Mortality Improvement Scale MP-2020

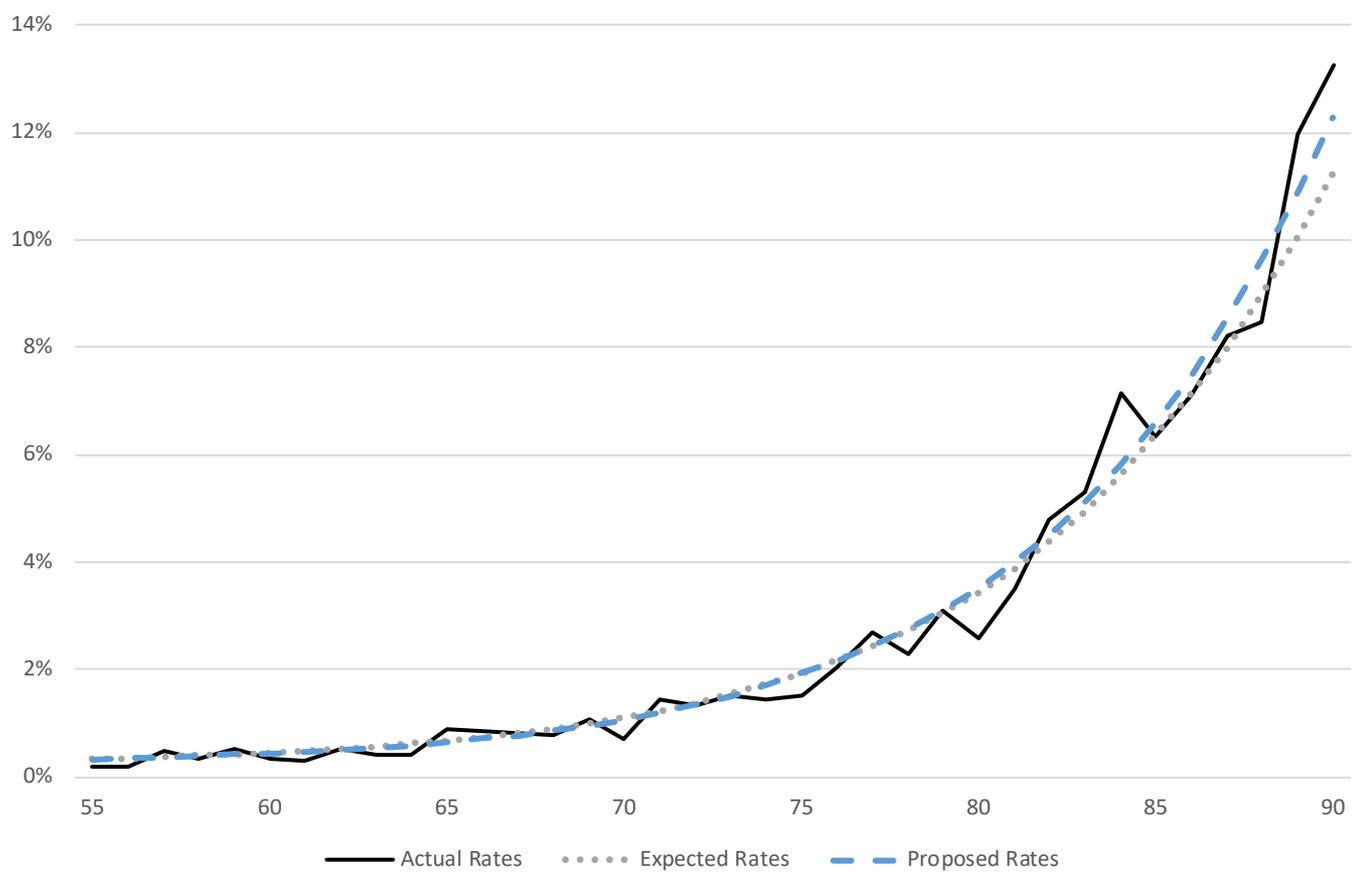
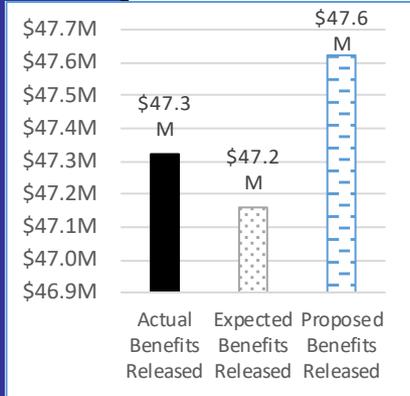


Post-Retirement Mortality

State Females



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent State experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; MSF 1yr; F SB 1yr, 1.5% compounding increase from ages 70 to 85

Proposed: Pub2010 Ret - General Females, 110% for all years, Modified Mortality Improvement Scale MP-2020

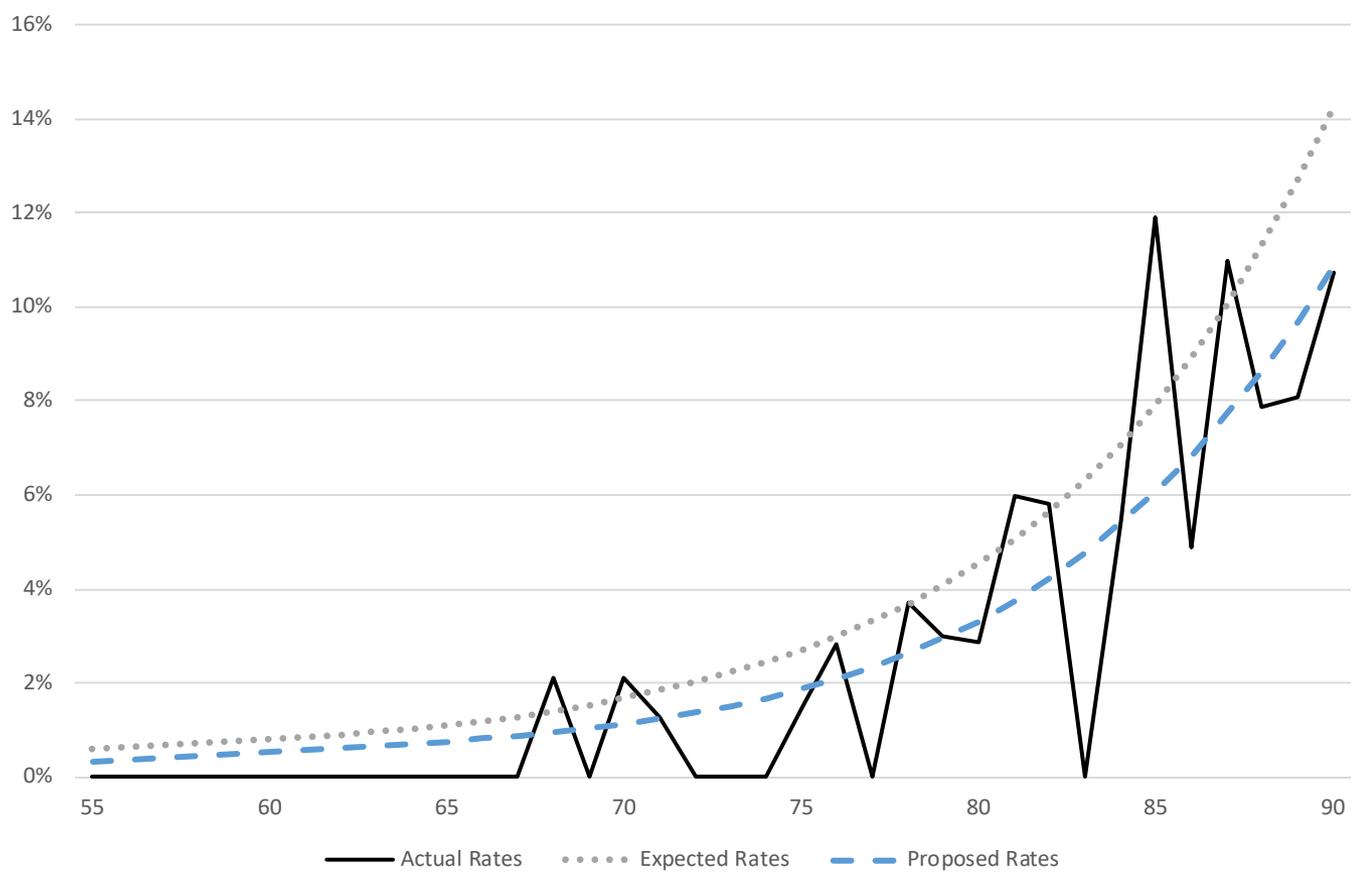
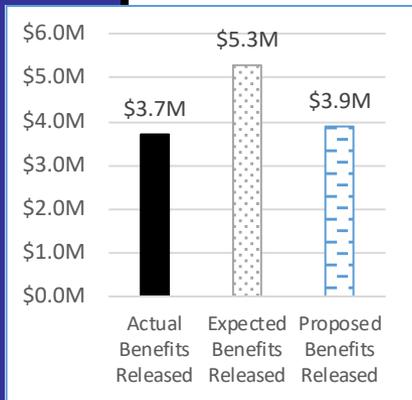


Post-Retirement Mortality

JRS Males



Comment: In the last review we comingled JRS and State members. Since then, JRS members had mortality losses while State did not. Our experience with other systems is that judges have longer life expectancy than other public sector groups. Based on our analysis of JRS, we recommend a PUB2010 public sector mortality table, modified to reflect JRS experience. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; MSF 1yr; F SB 1yr, 1.5% compounding increase from ages 70 to 85

Proposed: Pub2010 Ret - General Males, 95% for all years, set back 2 years, Modified Mortality Improvement Scale MP-2020

Master Page # 90 of 223 - Benefits and Actuarial Committee (B&A) Meeting 4/19/2021



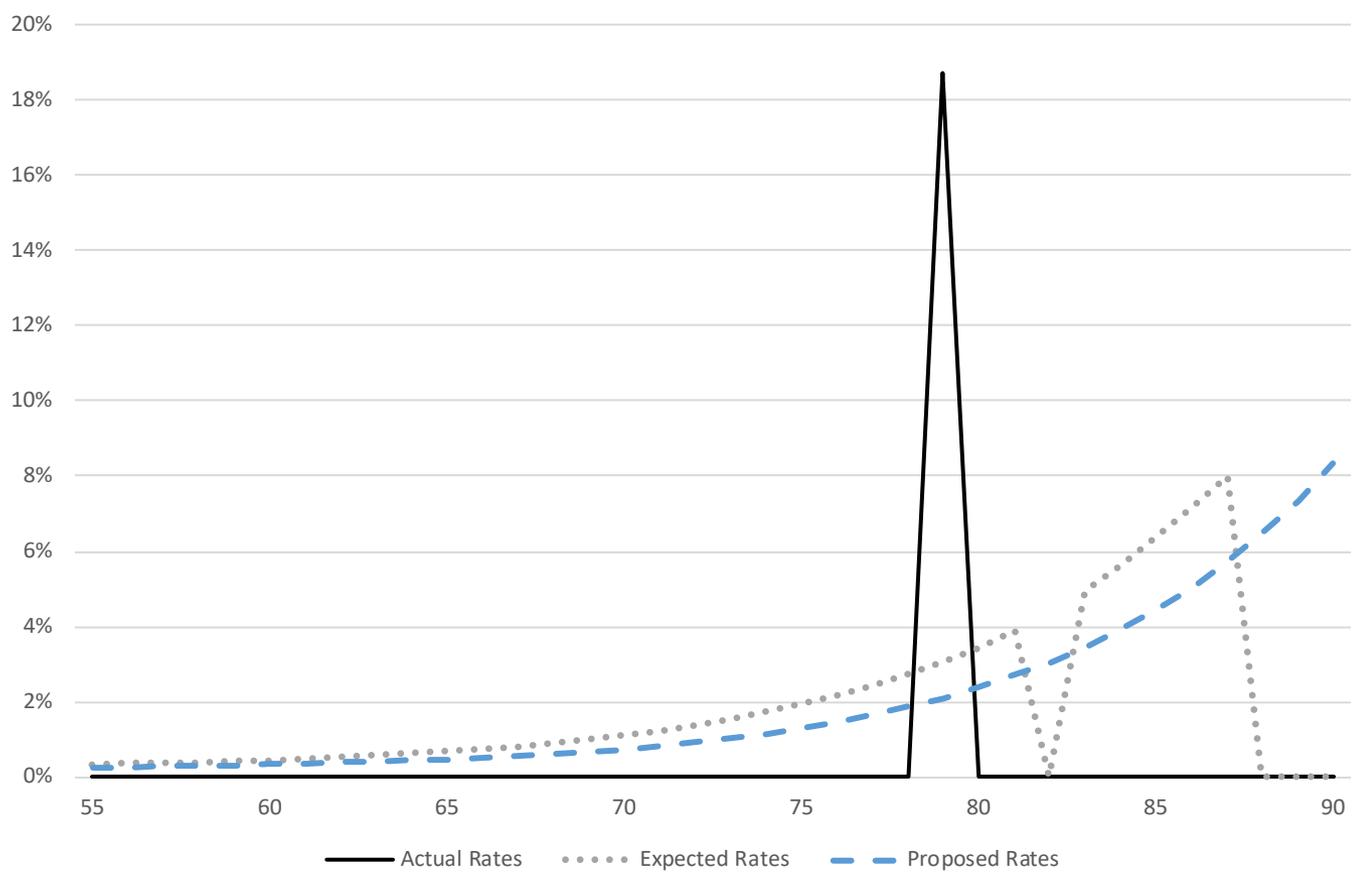
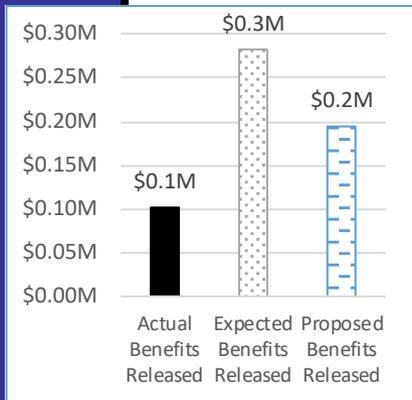
Post-Retirement Mortality

JRS

Females



Comment: In the last review we comingled JRS and State members. Since then, JRS members had mortality losses while State did not. Our experience with other systems is that judges have longer life expectancy than other public sector groups. Based on our analysis of JRS, we recommend a PUB2010 public sector mortality table, modified to reflect JRS experience. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; MSF 1yr; F SB 1yr, 1.5% compounding increase from ages 70 to 85

Proposed: Pub2010 Ret - General Females, .95% for all years, set back 2 years, Modified Mortality Improvement Scale MP-2020

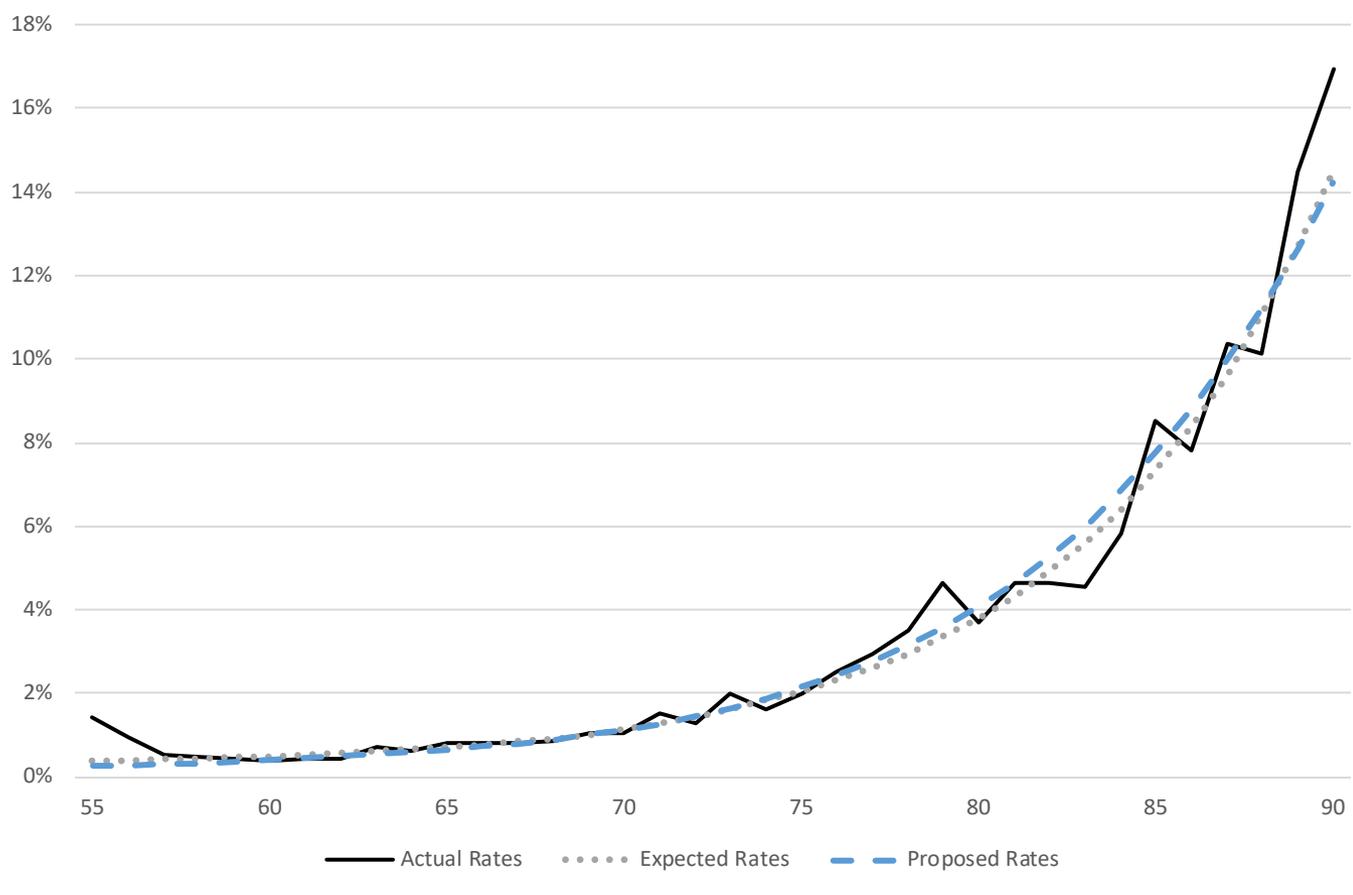
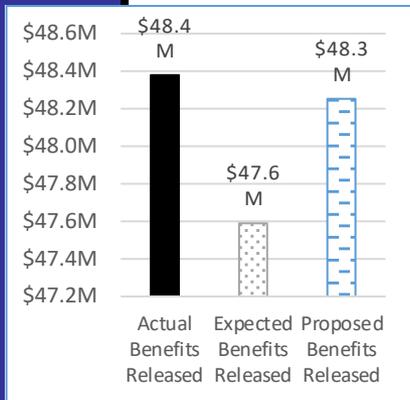
Master Page # 91 of 223 - Benefits and Actuarial Committee (B&A) Meeting 4/19/2021



Post-Retirement Mortality Teachers Males



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



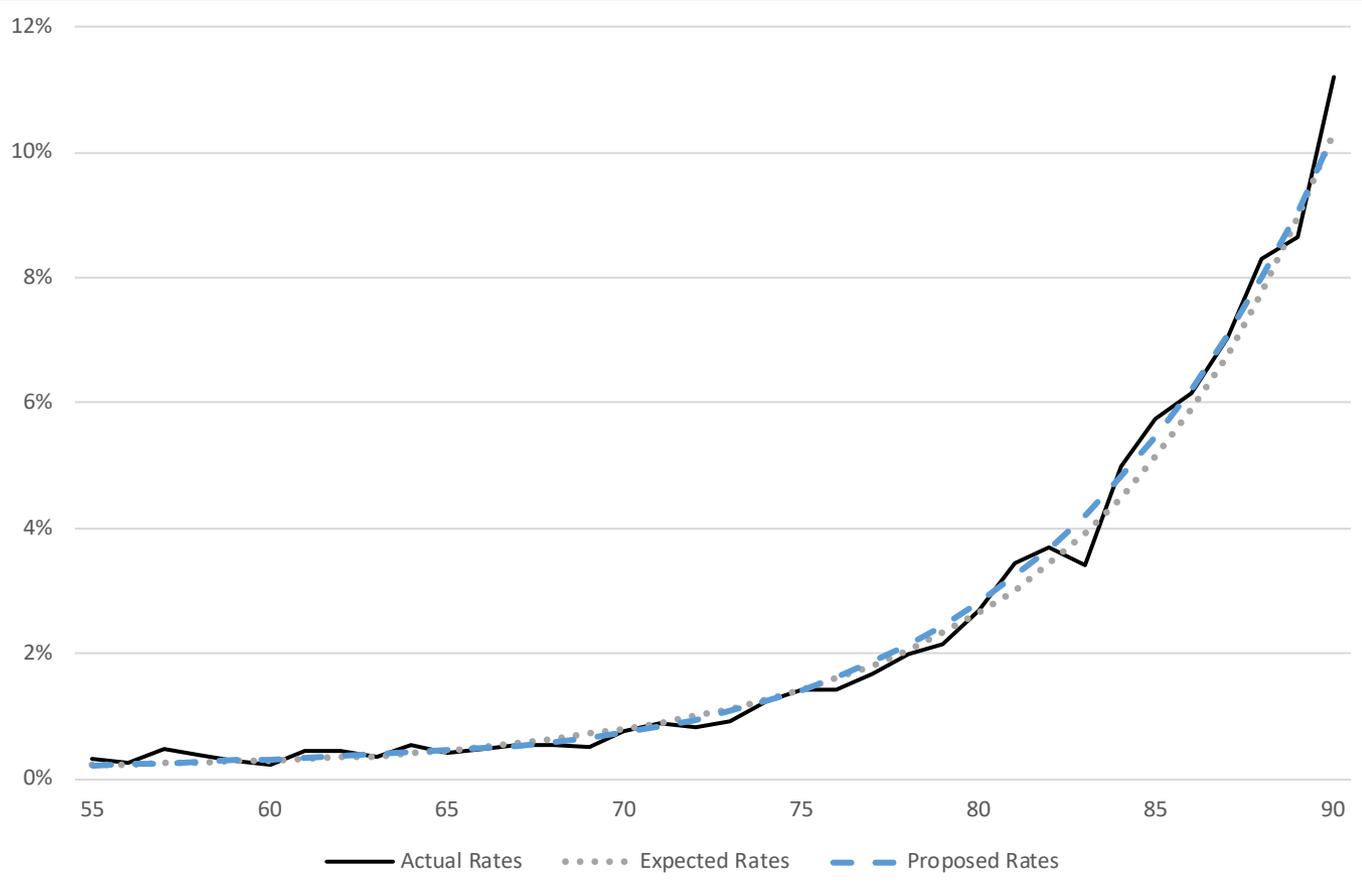
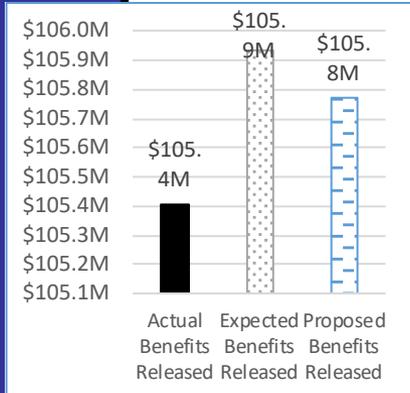
Expected: RP-2014 White Collar Employee Rates to age 49, White Collar Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; M 1% increase compounded from 70 to 90; F SB 3yr, 1.5% increase compounded from ages 65 to 70, and 2.0% increase
 Proposed: Pub2010 Ret - Teachers Males, set forward 1 year, Modified Mortality Improvement Scale MP-2020



Post-Retirement Mortality Teachers Females



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



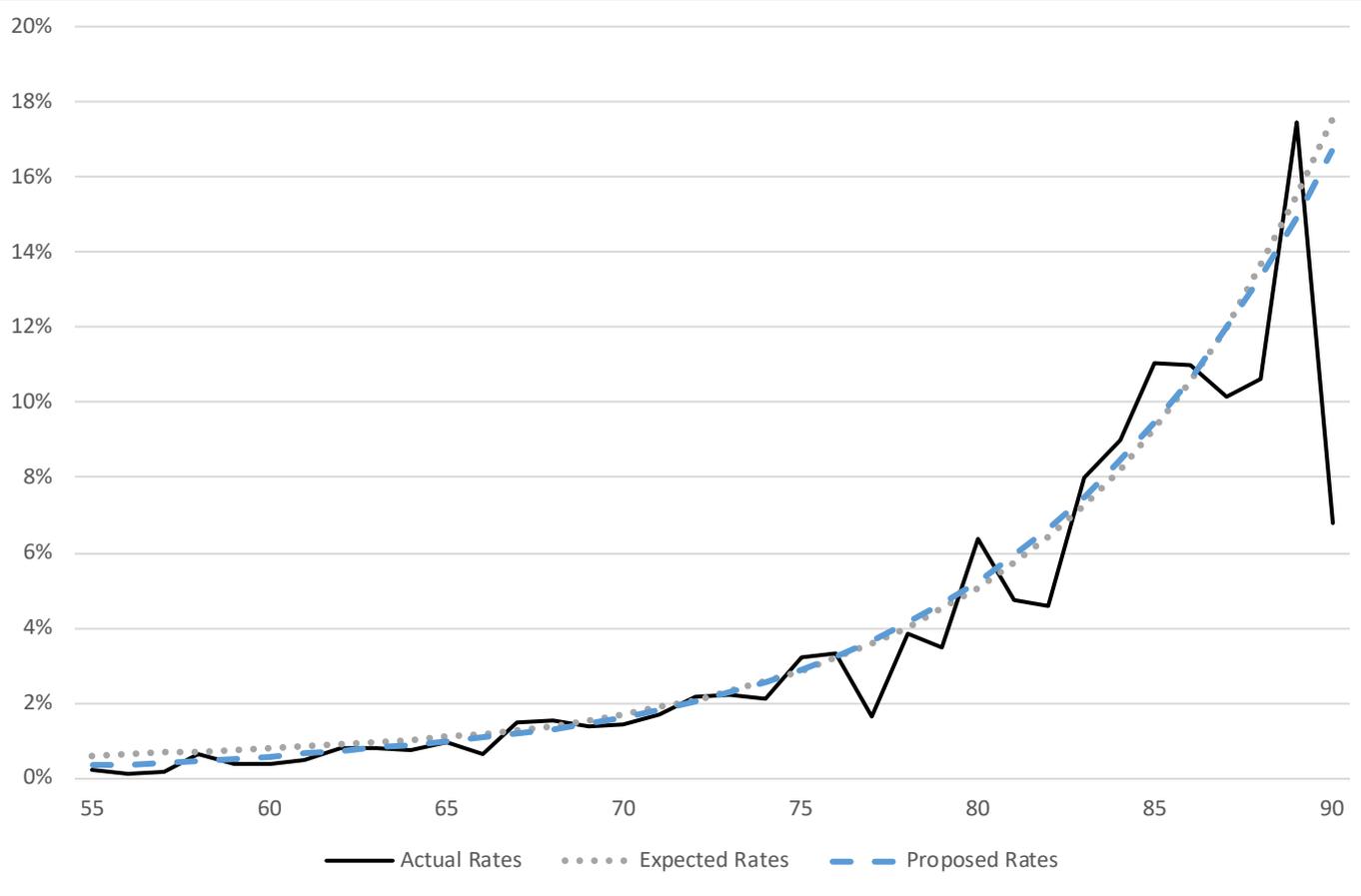
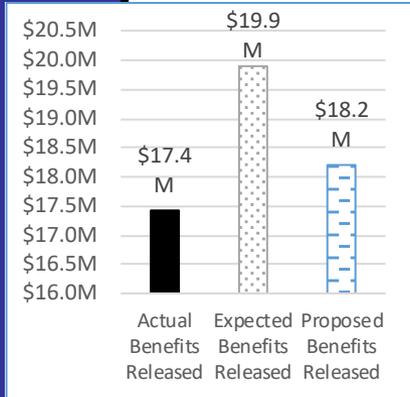
Expected: RP-2014 White Collar Employee Rates to age 49, White Collar Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; M 1% increase compounded from 70 to 90; F SB 3yr, 1.5% increase compounded from ages 65 to 70, and 2.0% increase
 Proposed: Pub2010 Ret - Teachers Females, 105% for all years, Modified Mortality Improvement Scale MP-2020



Post-Retirement Mortality Hazardous Duty Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Hazardous Duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; MSF 1yr, 1% increase compounded from ages 70 to 90; F SF 3yr

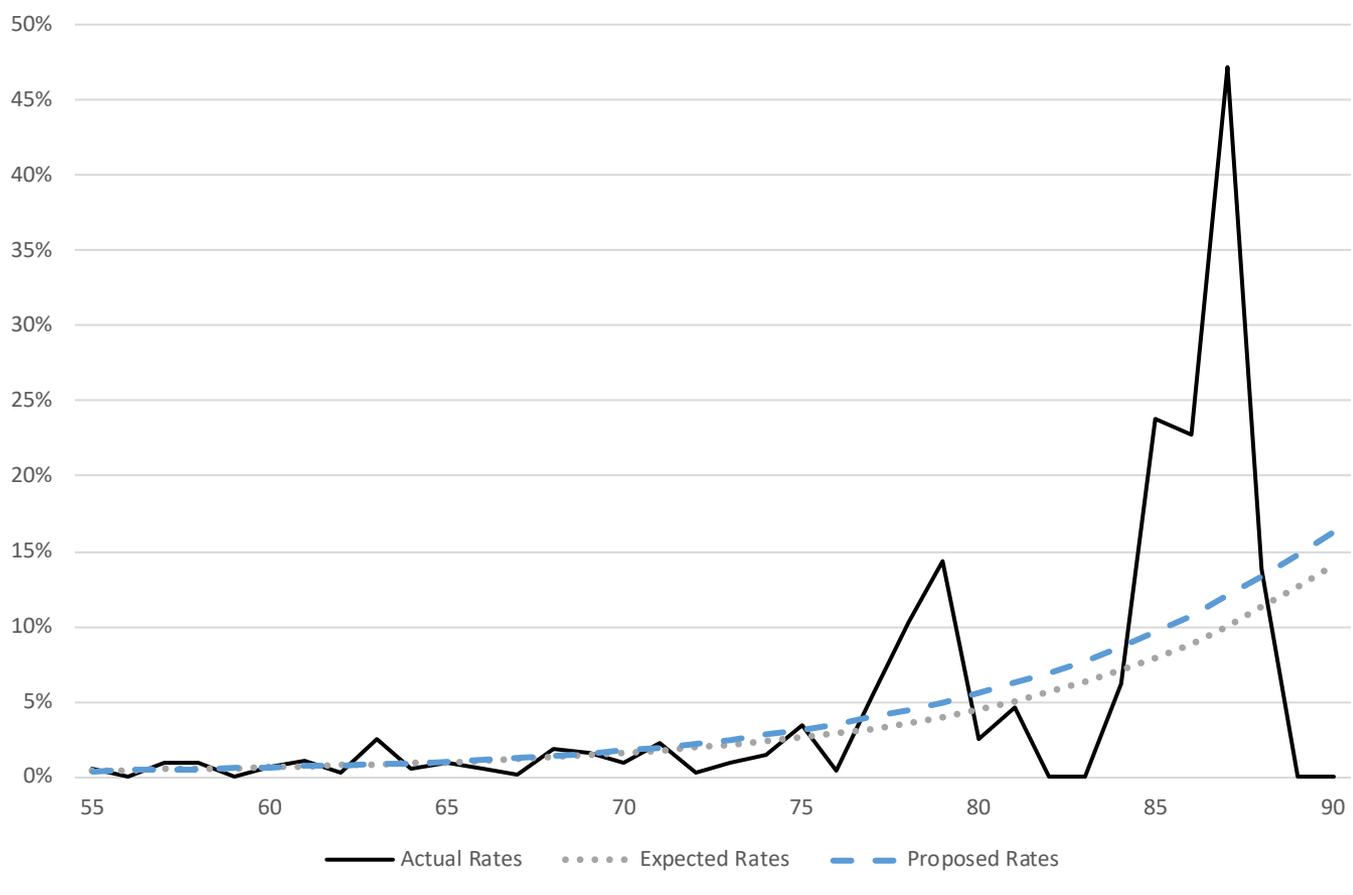
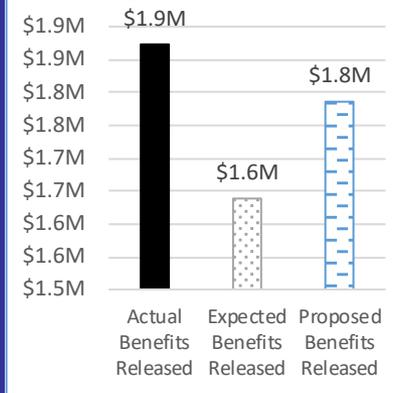
Proposed: Pub2010 Ret - Safety Males, 110% for all years, Modified Mortality Improvement Scale MP-2020



Post-Retirement Mortality Hazardous Duty Females



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Hazardous Duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; MSF 1yr, 1% increase compounded from ages 70 to 90; F SF 3yr

Proposed: Pub2010 Ret - Safety Females, 105% for all years, set forward 3 years, Modified Mortality Improvement Scale MP-2020

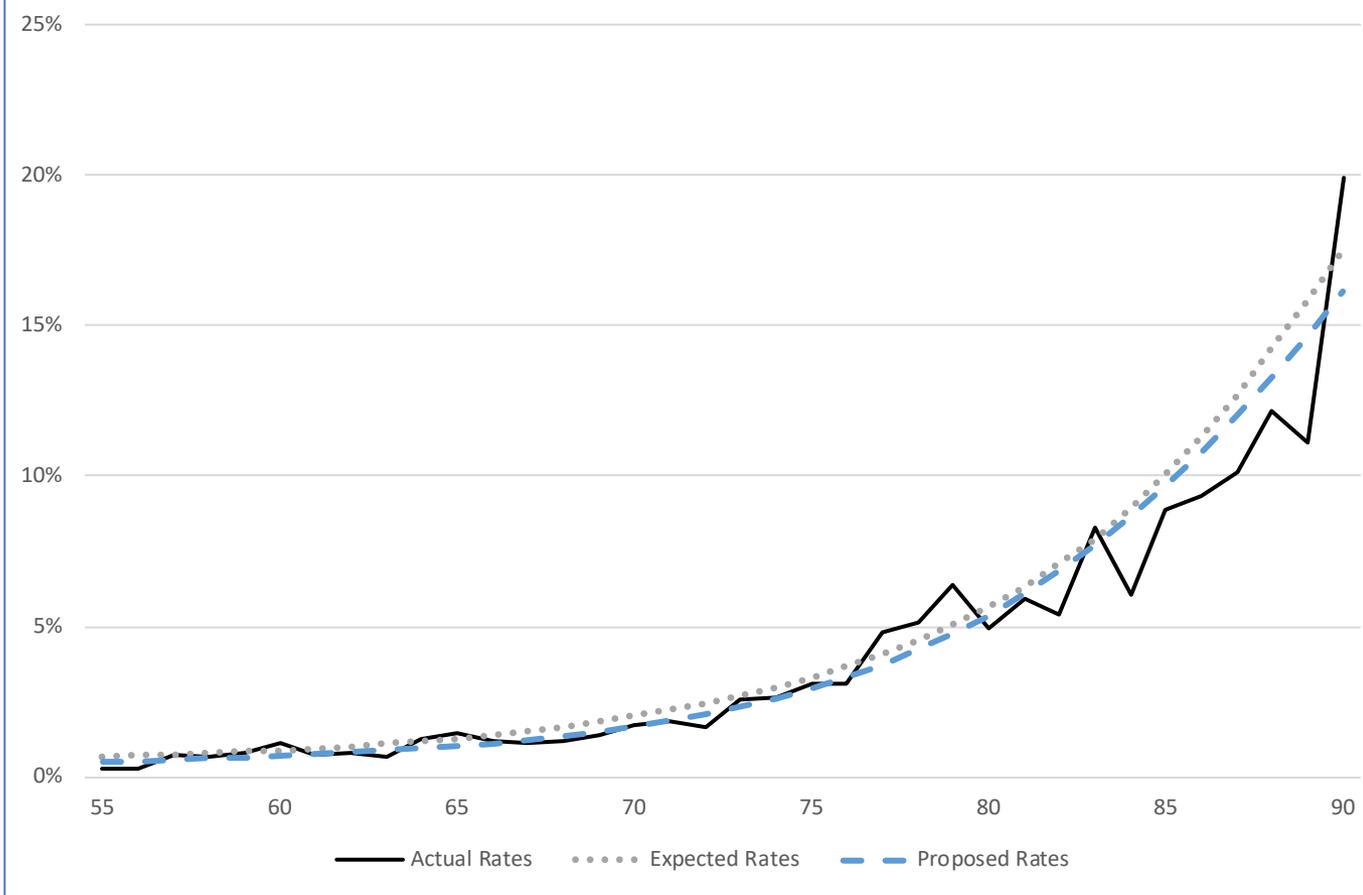
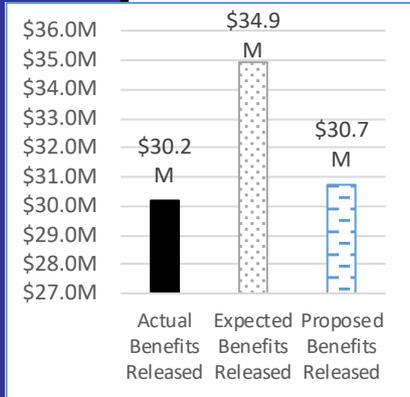


Post-Retirement Mortality

Political Subdivisions Non Hazardous Duty Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Local non hazardous duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; M SF 3yr; F 1.0% increase compounded from ages 70 to 90

Proposed: Pub2010 Ret - General Males, 95% for all years, set forward 2 years, Modified Mortality Improvement Scale MP-2020

Master Page # 96 of 223 - Benefits and Actuarial Committee (B&A) Meeting 4/19/2021

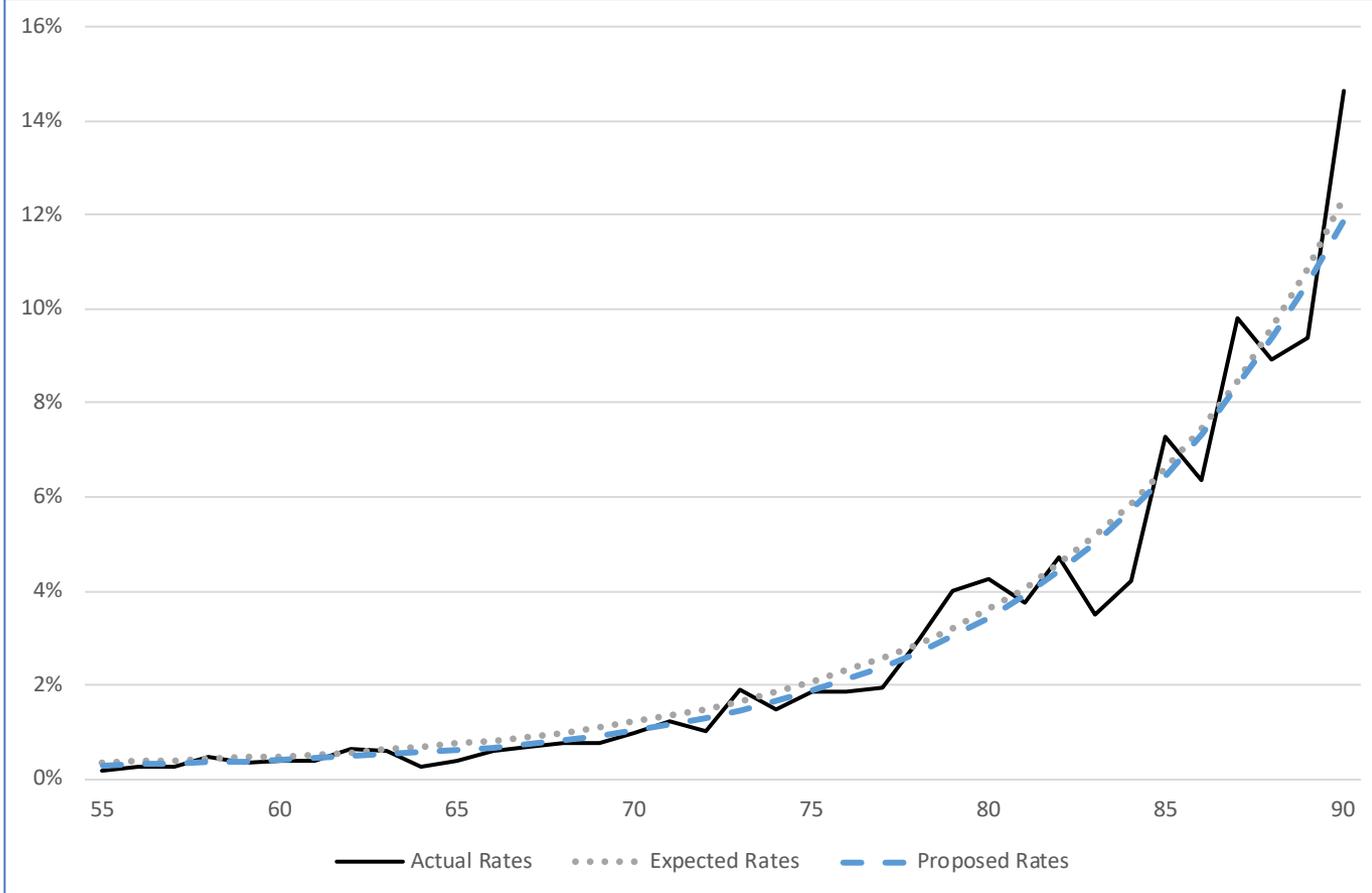
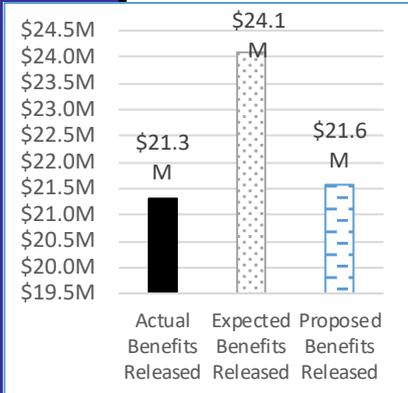


Post-Retirement Mortality

Political Subdivisions Non Hazardous Duty Females



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Local non hazardous duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 49, Healthy Annuitant Rates at ages 50 and older Projected BB to 2020; M SF 3yr; F 1.0% increase compounded from ages 70 to 90

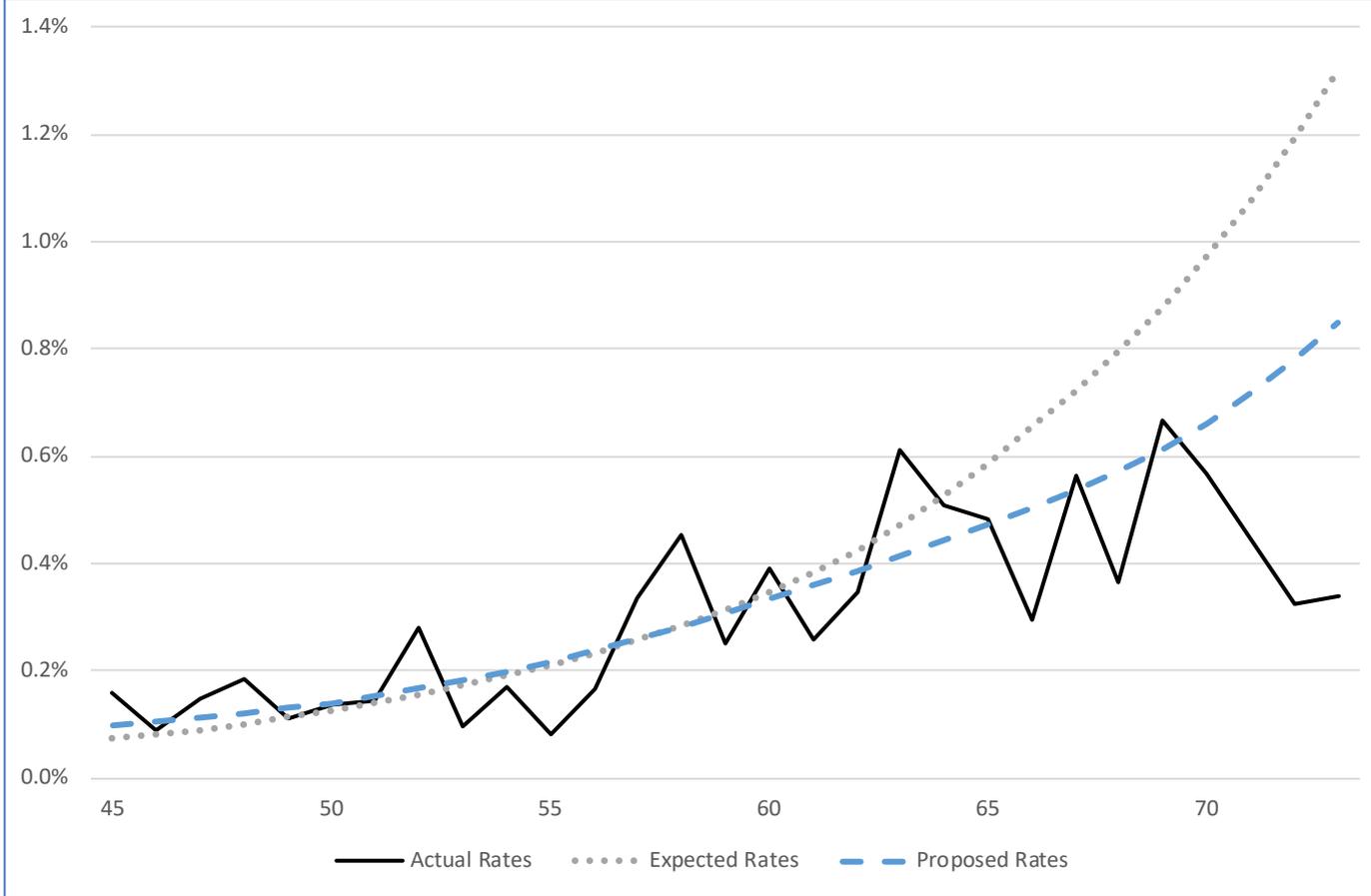
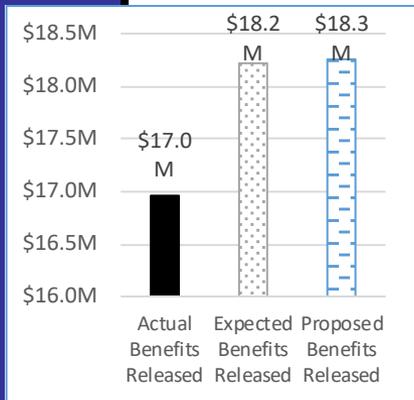
Proposed: Pub2010 Ret - General Females, .95% for all years, set forward 1 year, Modified Mortality Improvement Scale MP-2020



Pre-Retirement Mortality State Males



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for pre-retirement mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; MSB 1yr, 85% of rates; F SB 1yr

Proposed: Pub2010 FF - General Males, Modified Mortality Improvement Scale MP-2020

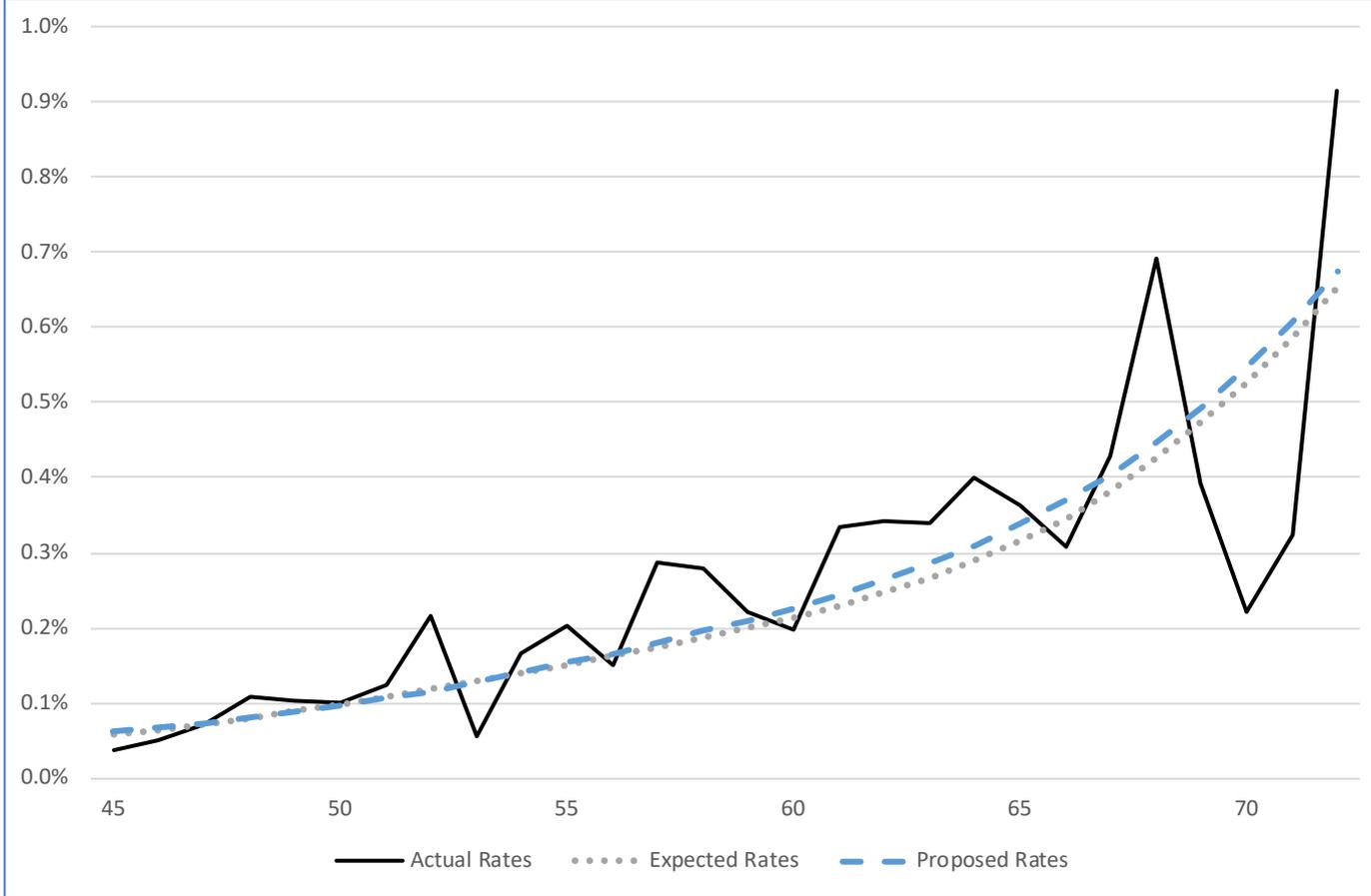


Pre-Retirement Mortality

State Females



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent State experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; MSB 1yr, 85% of rates; F SB 1yr

Proposed: Pub2010 FF - General Females, set forward 2 years, Modified Mortality Improvement Scale MP-2020



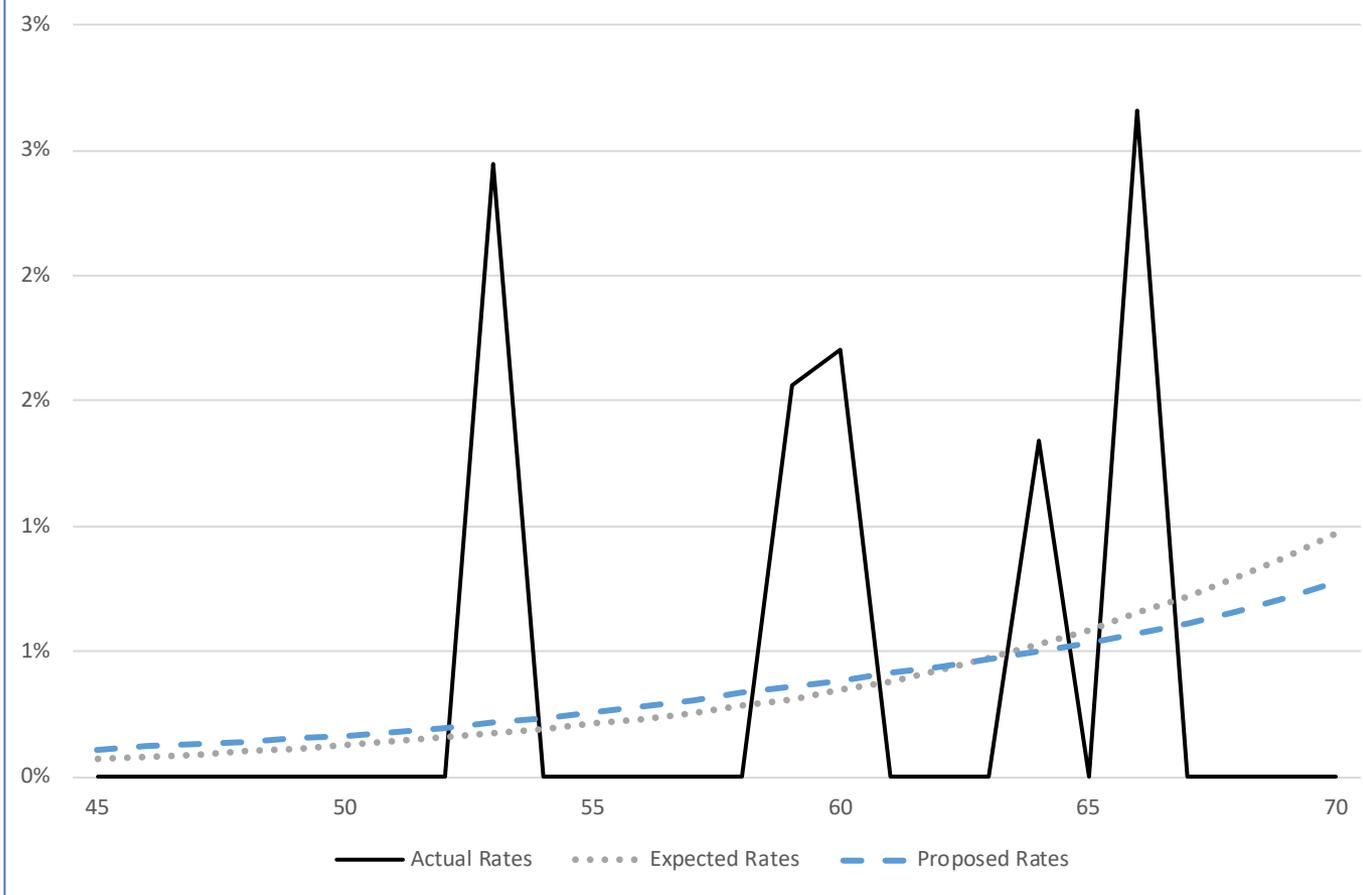
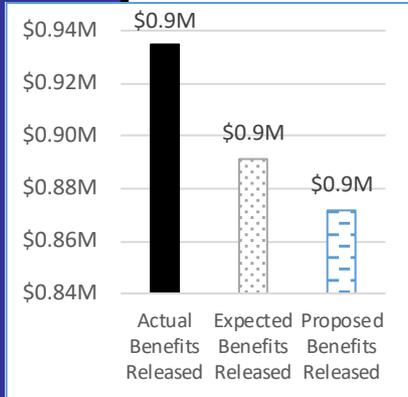
Pre-Retirement Mortality

JRS

Males



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for preretirement mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; MSB 1yr, 85% of rates; F SB 1yr

Proposed: Pub2010 FF - General Males, set forward 2 years, Modified Mortality Improvement Scale MP-2020



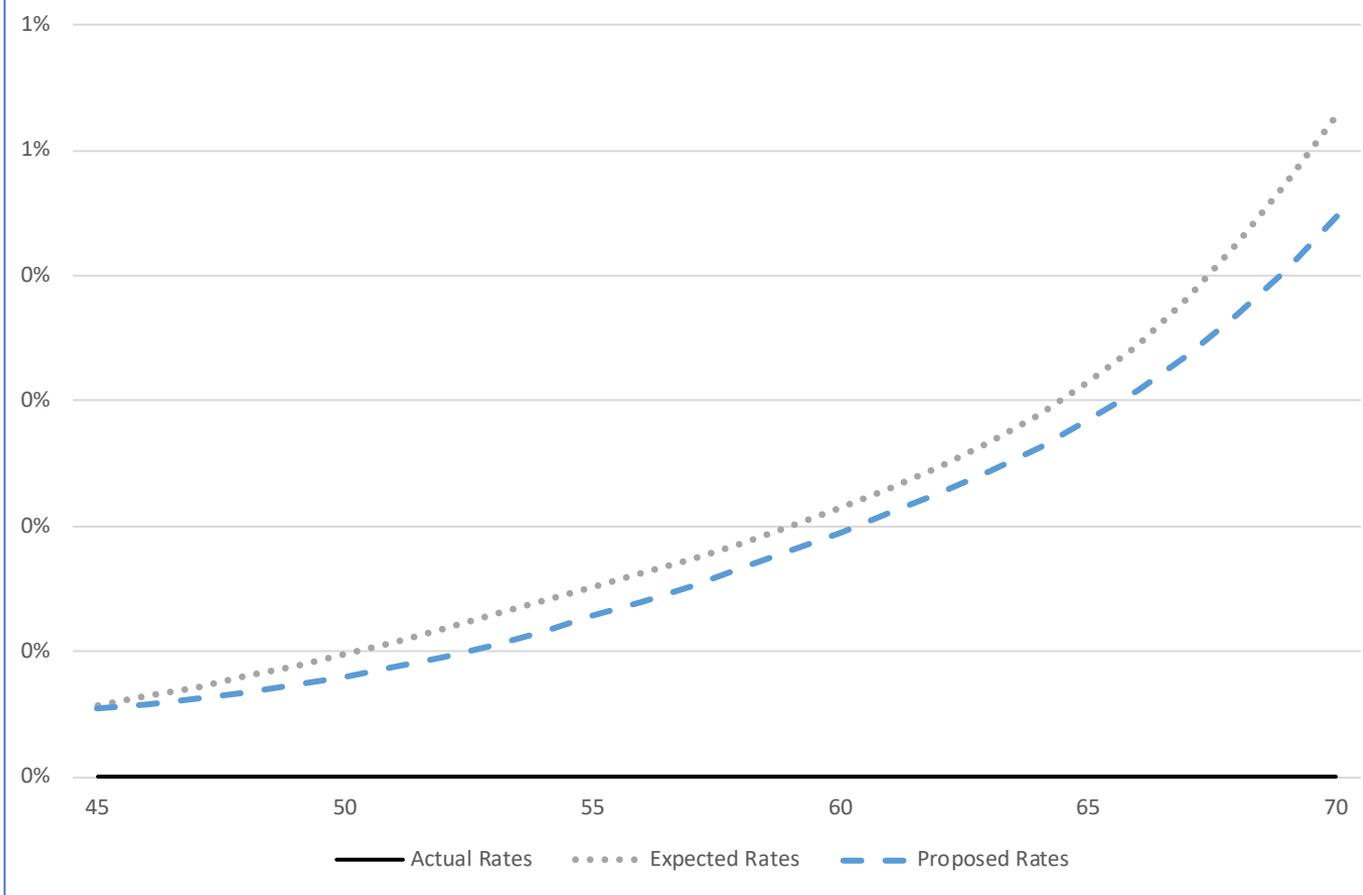
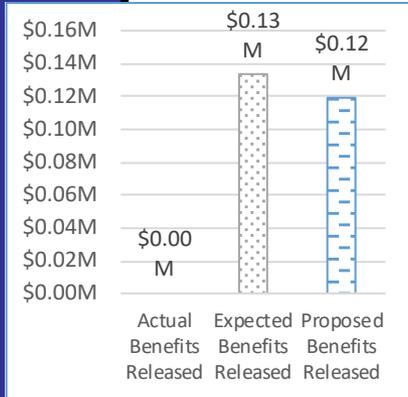
Pre-Retirement Mortality

JRS

Females



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for preretirement mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; MSB 1yr, 85% of rates; F SB 1yr

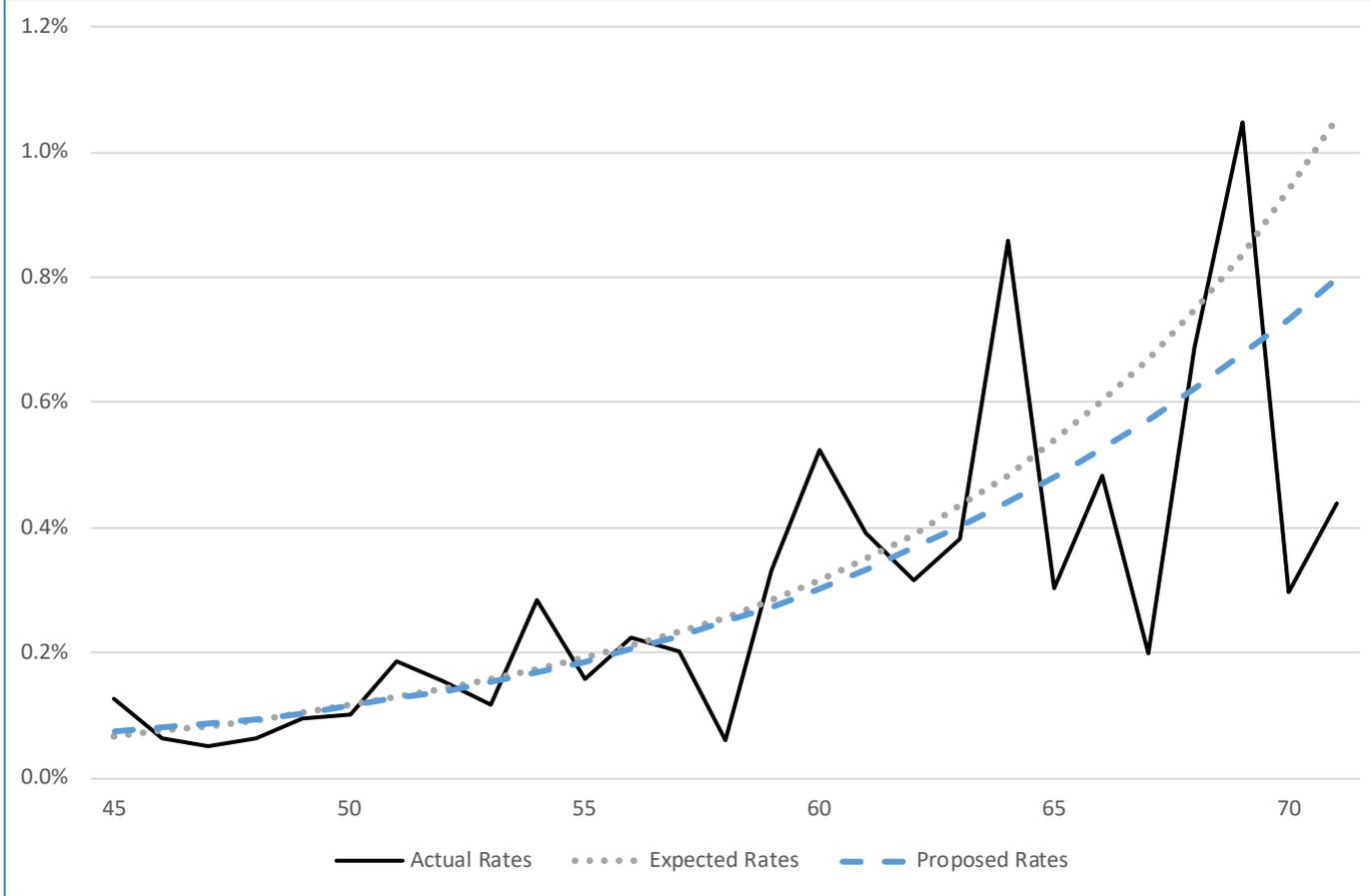
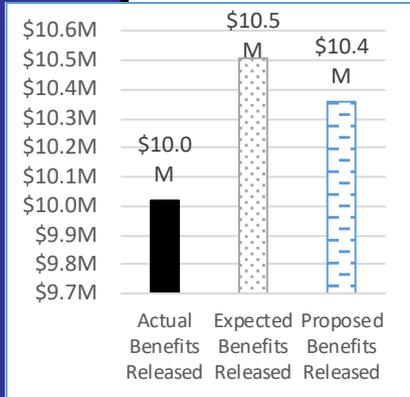
Proposed: Pub2010 FF - General Females, Modified Mortality Improvement Scale MP-2020



Pre-Retirement Mortality Teachers Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 White Collar Employee Rates to age 80, White Collar Healthy Annuitant Rates at ages 81 and older Projected BB to 2020

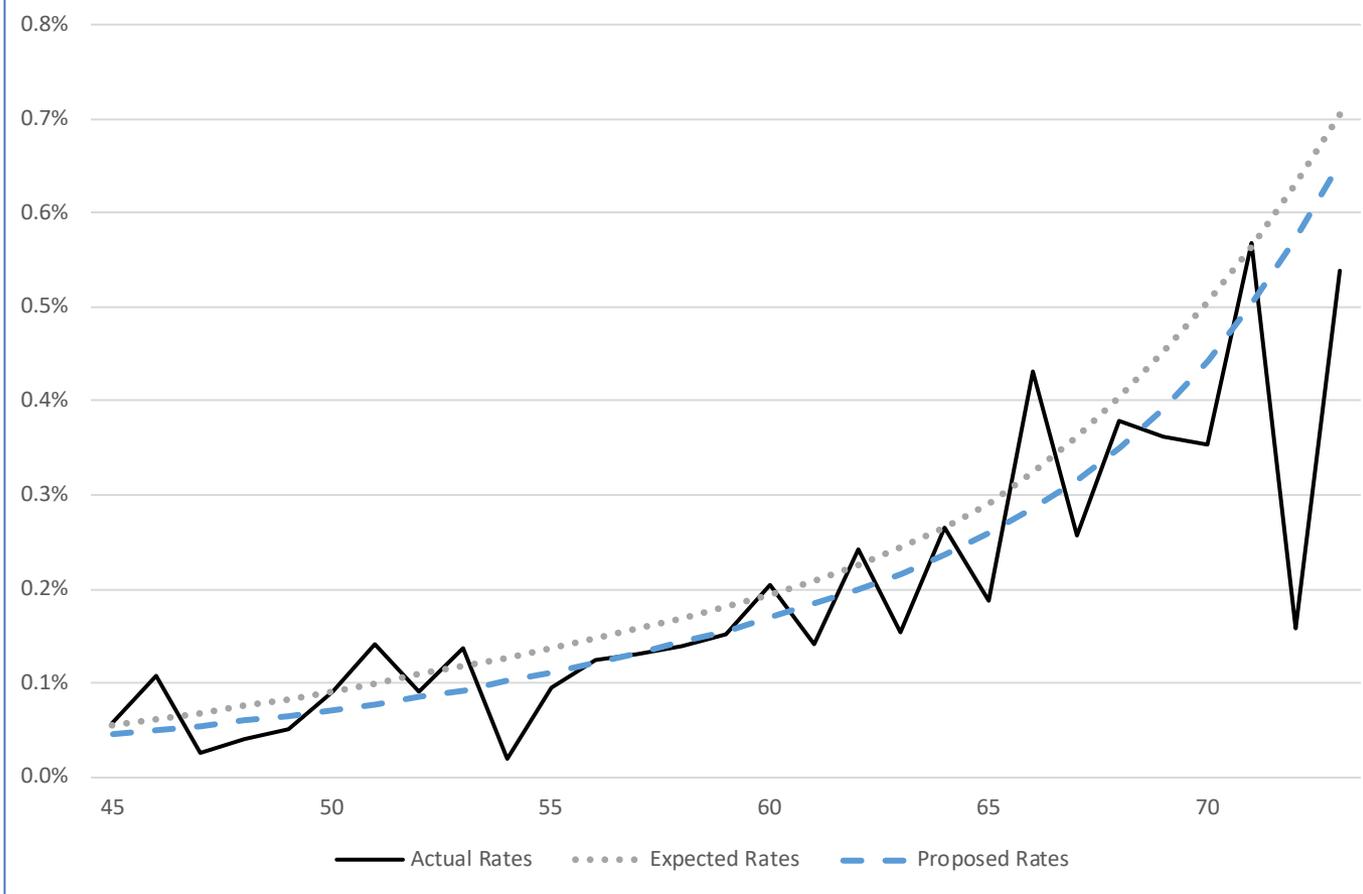
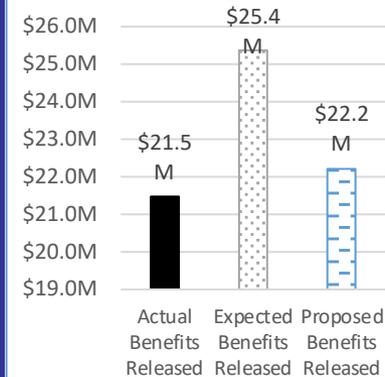
Proposed: Pub2010 FF - Teachers Males, 110% for all years, Modified Mortality Improvement Scale MP-2020



Pre-Retirement Mortality Teachers Females



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 White Collar Employee Rates to age 80, White Collar Healthy Annuitant Rates at ages 81 and older Projected BB to 2020

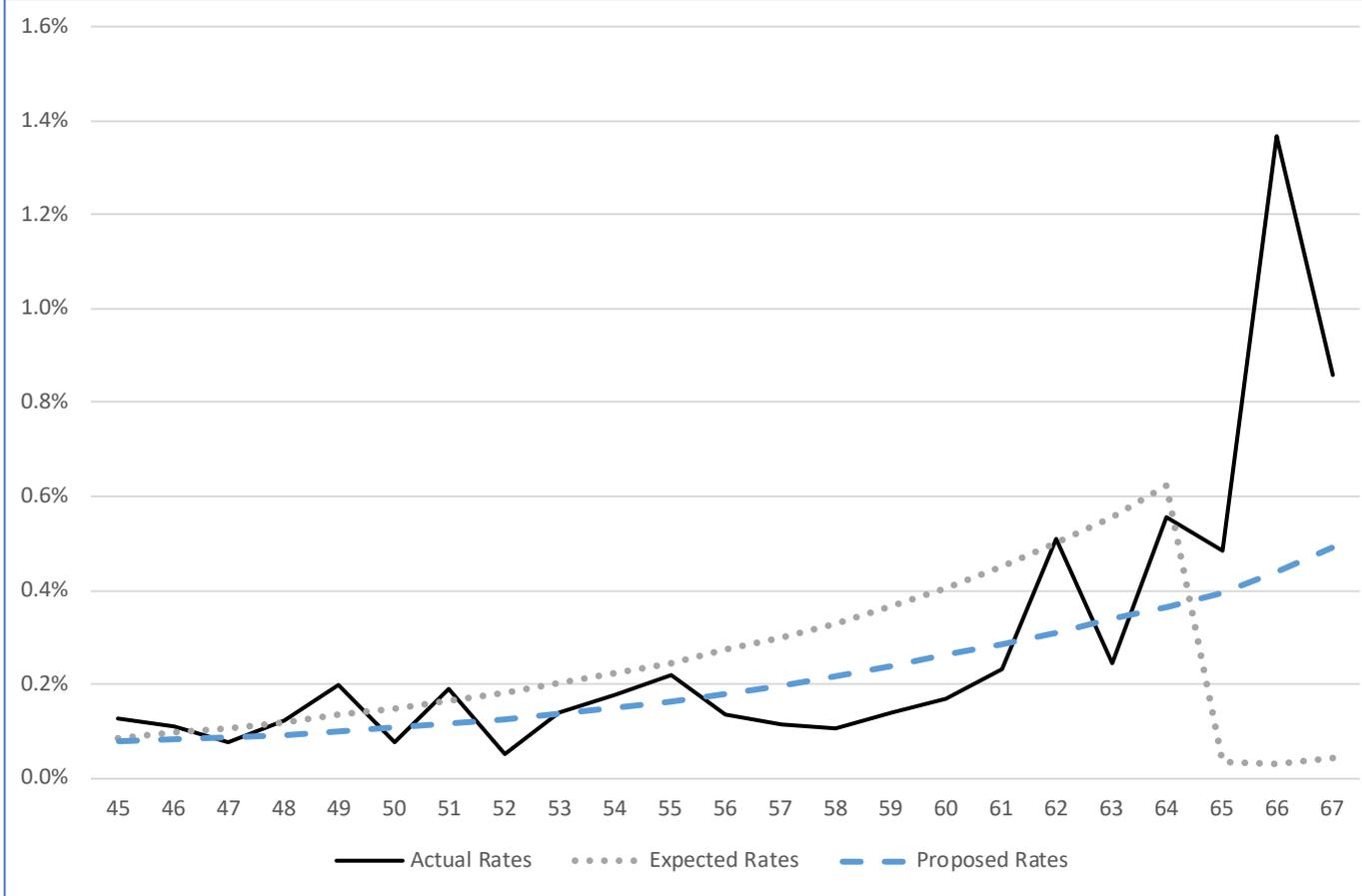
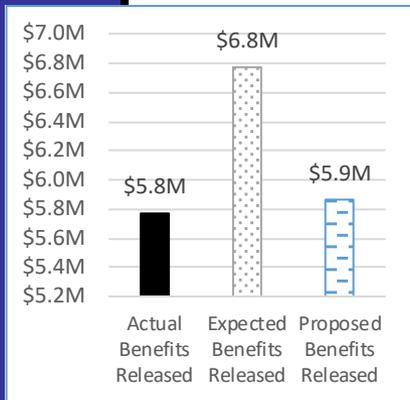
Proposed: Pub2010 FF - Teachers Females, Modified Mortality Improvement Scale MP-2020



Pre-Retirement Mortality Hazardous Duty Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Hazardous Duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; M 90% of Rates; F SF 1yr

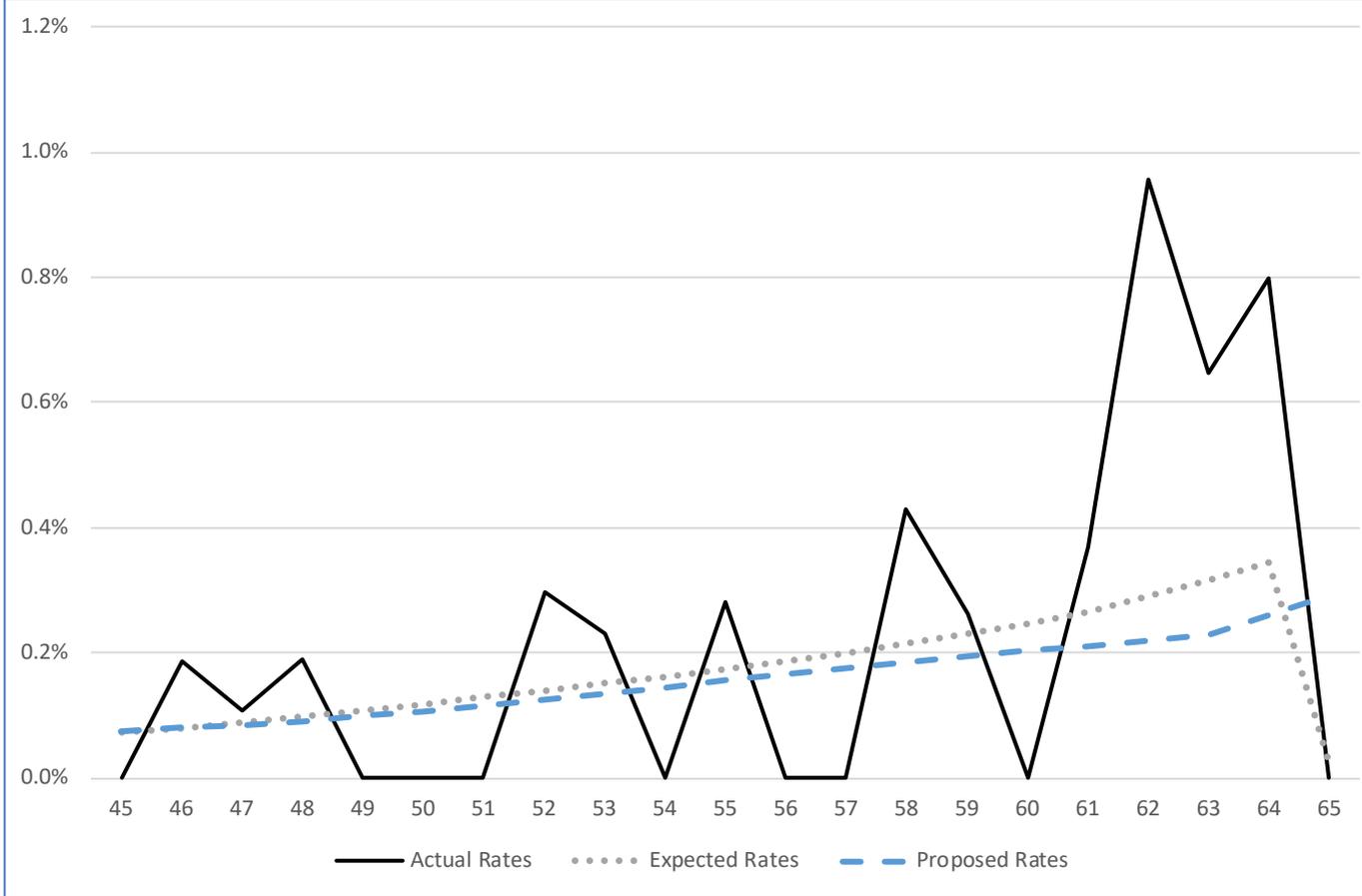
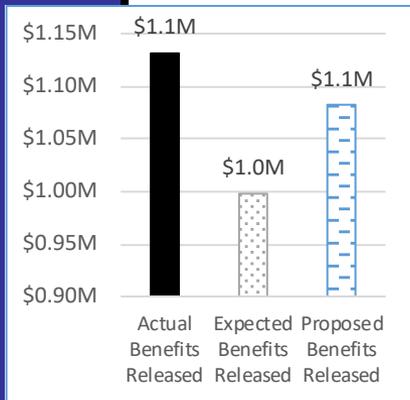
Proposed: Pub2010 FF - Safety Males, 95% for all years, Modified Mortality Improvement Scale MP-2020



Pre-Retirement Mortality Hazardous Duty Females



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Hazardous Duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; M 90% of Rates; F SF 1yr

Proposed: Pub2010 FF - Safety Females, 105% for all years, set forward 2 years, Modified Mortality Improvement Scale MP-2020

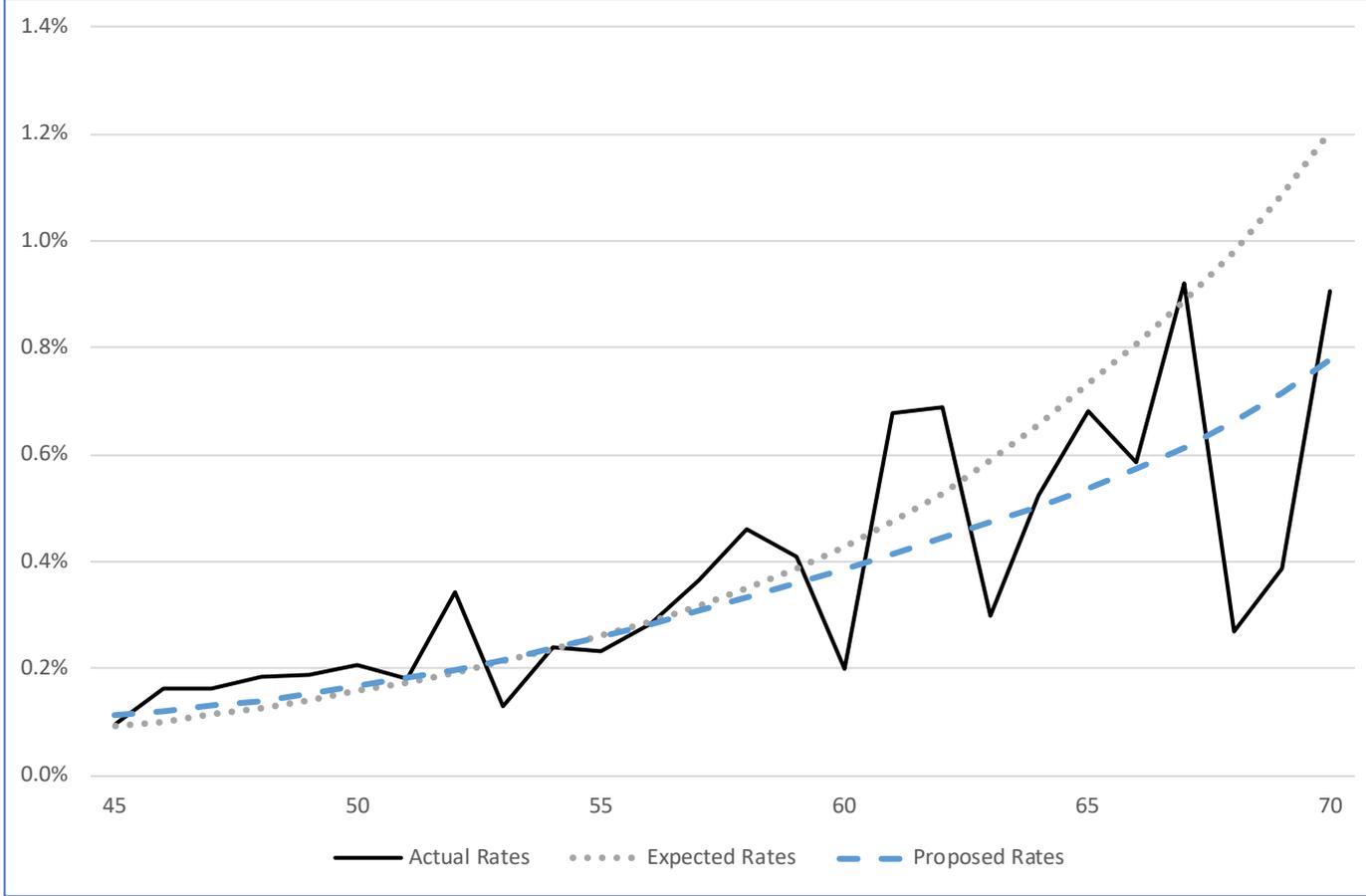
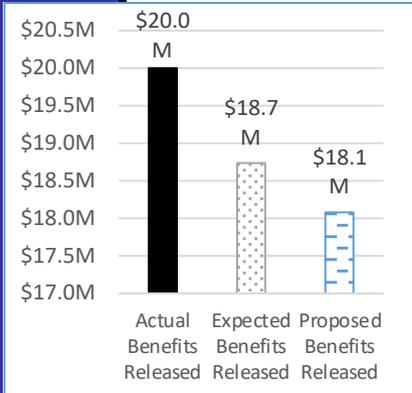


Pre-Retirement Mortality

Political Subdivisions Non Hazardous Duty Males



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for pre-retirement mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; M 95% of rates; F 105% of rates
 Proposed: Pub2010 FF - General Males, set forward 2 years, Modified Mortality Improvement Scale MP-2020

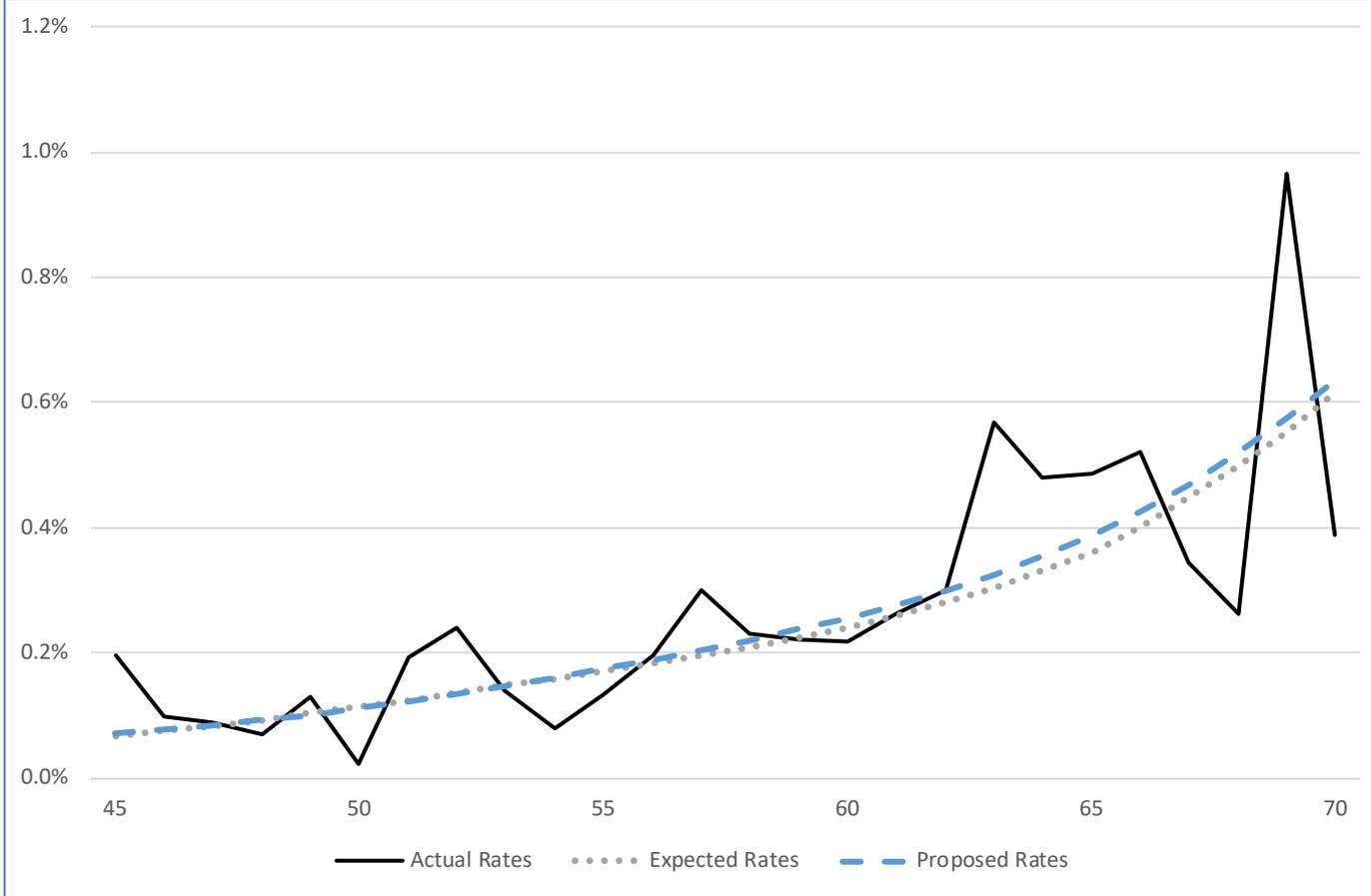
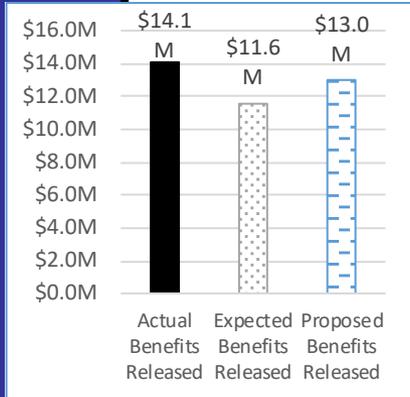


Pre-Retirement Mortality

Political Subdivisions Non Hazardous Duty Females



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Local non hazardous duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Employee Rates to age 80, Healthy Annuitant Rates at ages 81 and older Projected BB to 2020; M 95% of rates; F 105% of rates

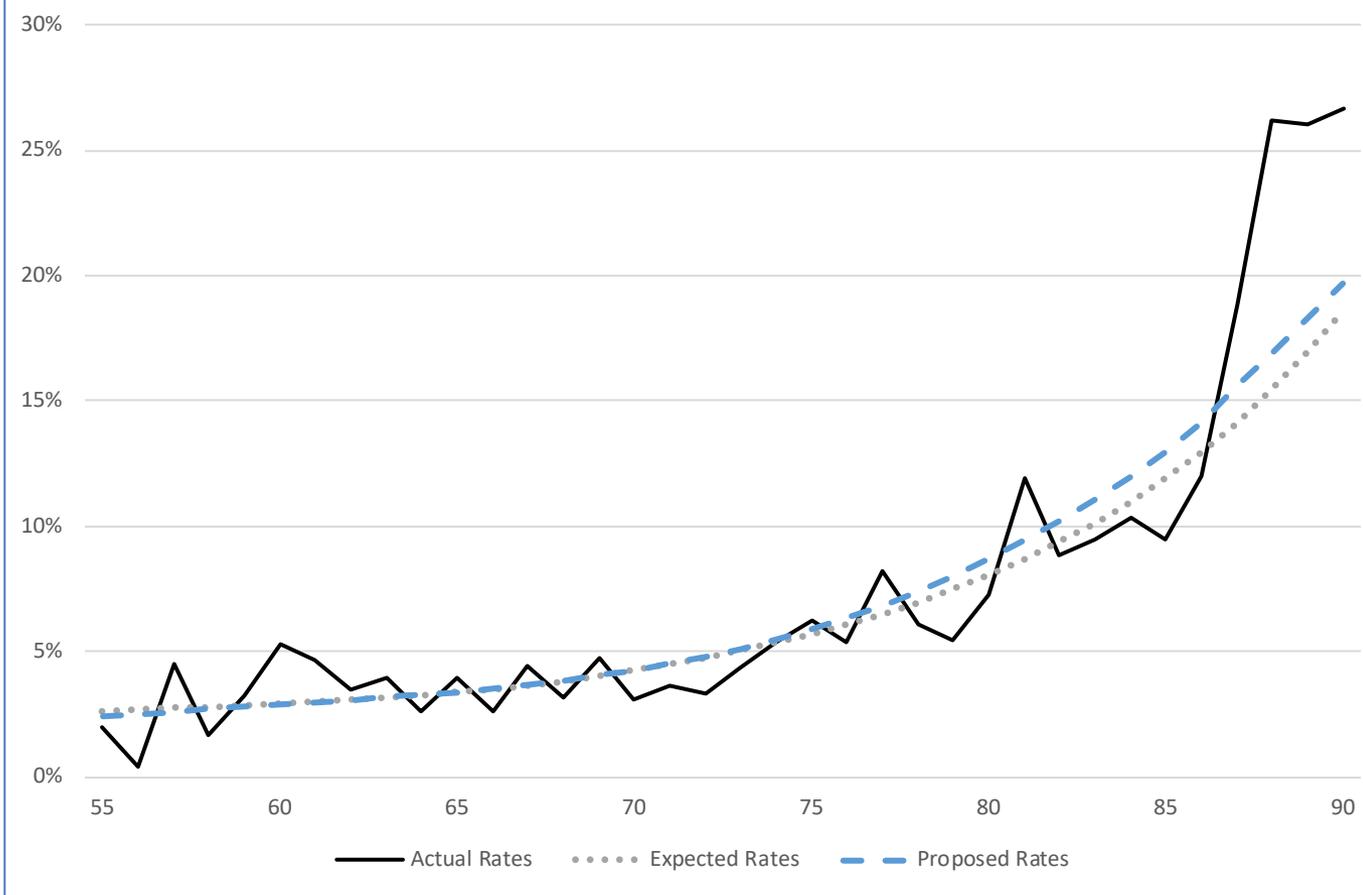
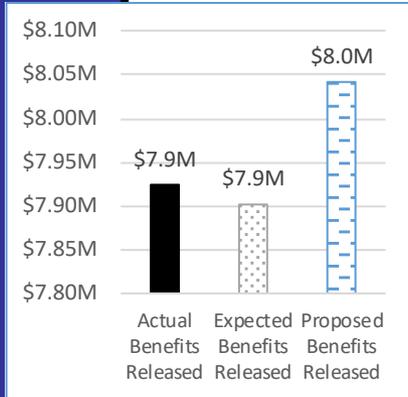
Proposed: Pub2010 FF - General Females, 105% for all years, set forward 3 years, Modified Mortality Improvement Scale MP-2020



Disabled Mortality State Males



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for disability mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; M 115% of rates; F 130% of rates

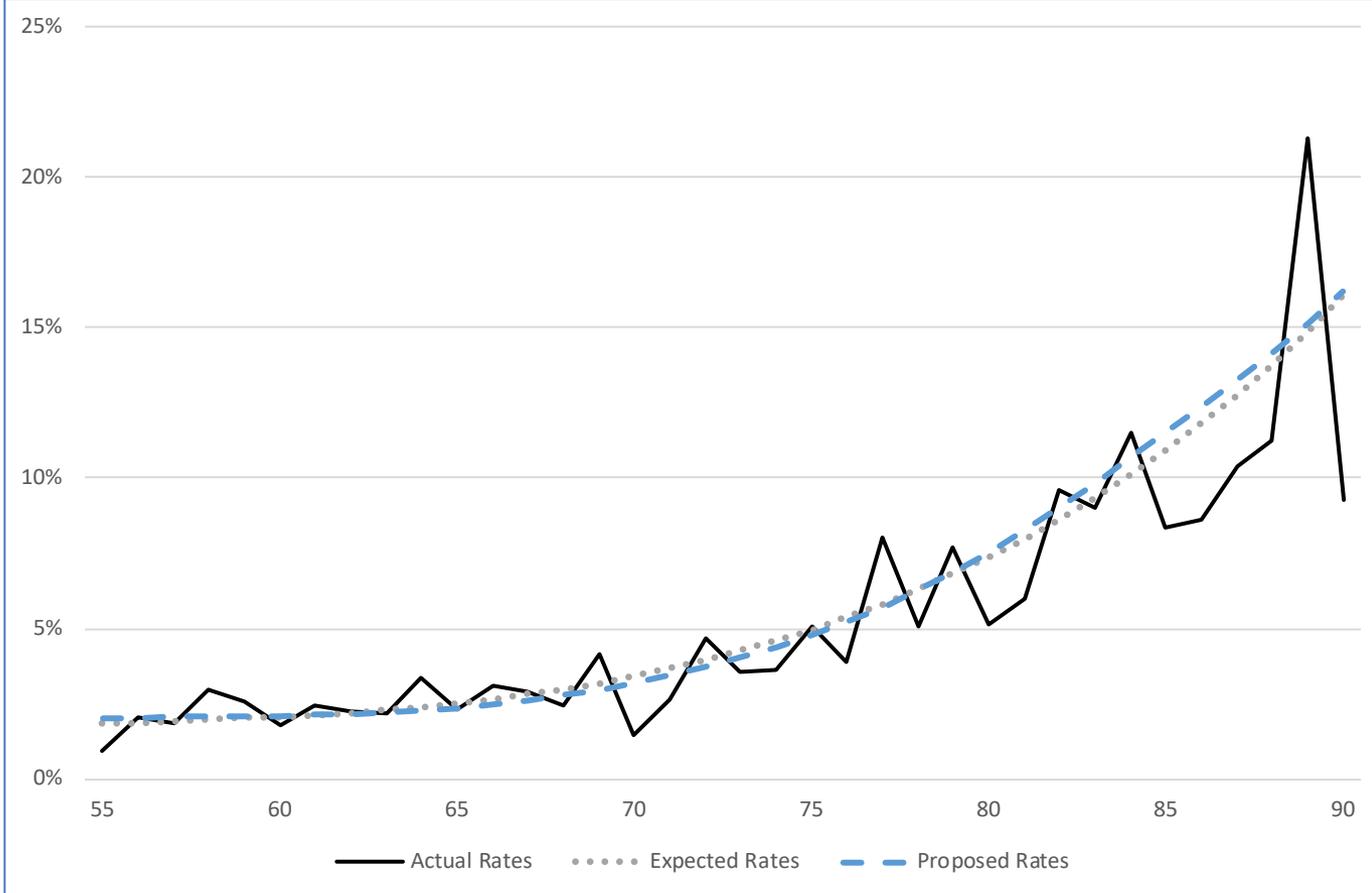
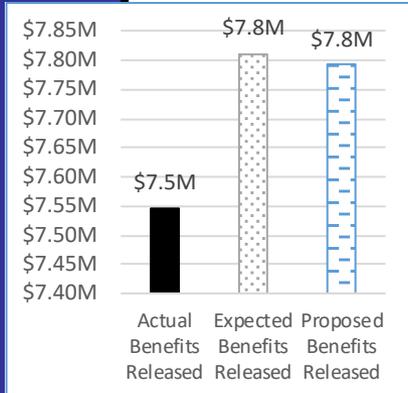
Proposed: Pub2010.Dis - General Males, set forward 3 years, Modified Mortality Improvement Scale MP-2020



Disabled Mortality State Females



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for disability mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; M 115% of rates; F 130% of rates

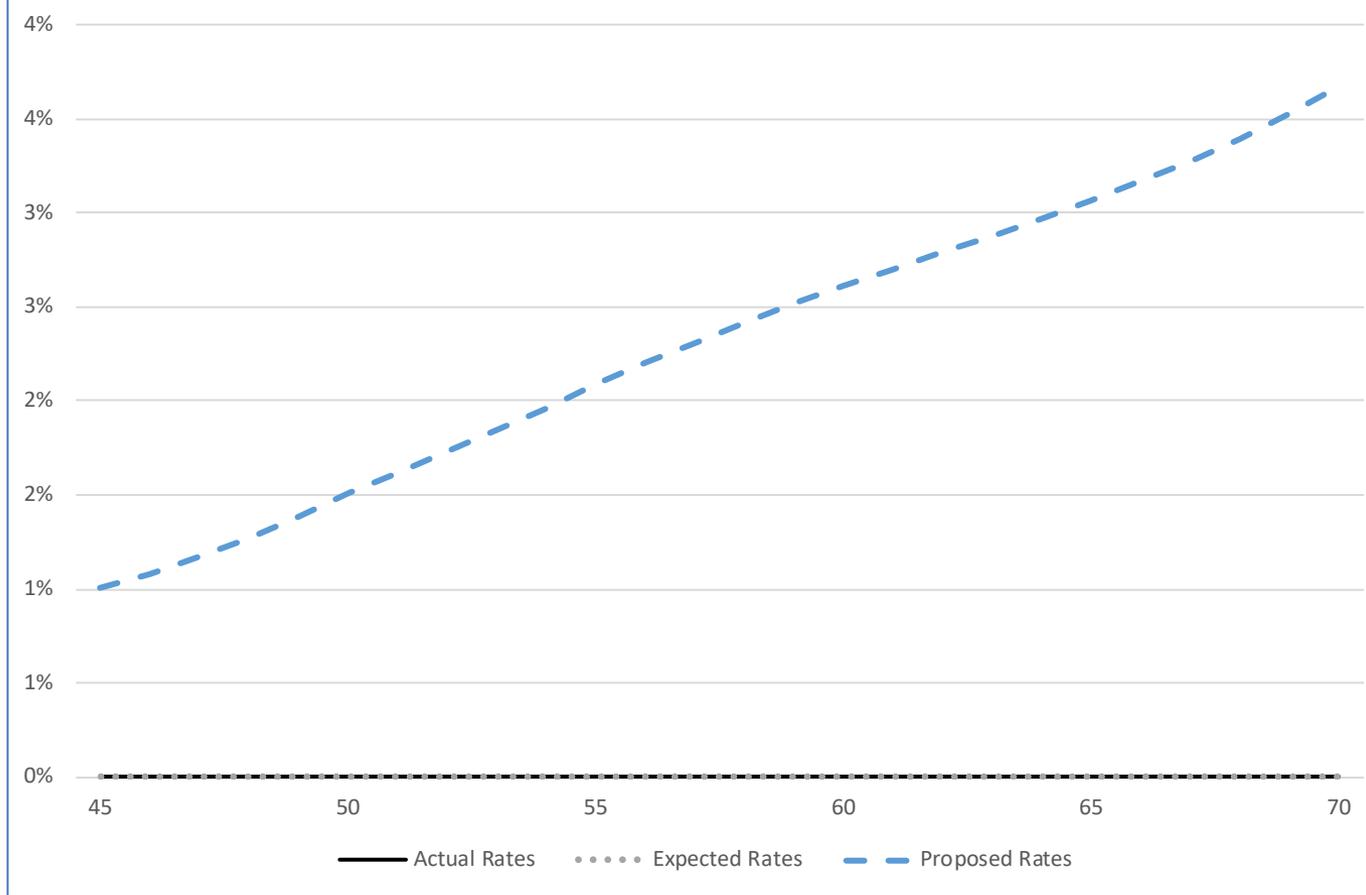
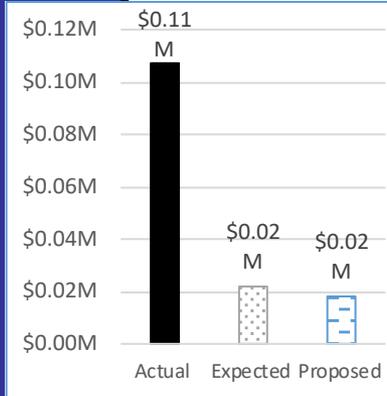
Proposed: Pub2010.Dis - General Females, set forward 3 years, Modified Mortality Improvement Scale MP-2020



Disabled Mortality JRS Males



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for disability mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; M 115% of rates; F 130% of rates

Proposed: Pub2010.Dis - General Males, Modified Mortality Improvement Scale MP-2020

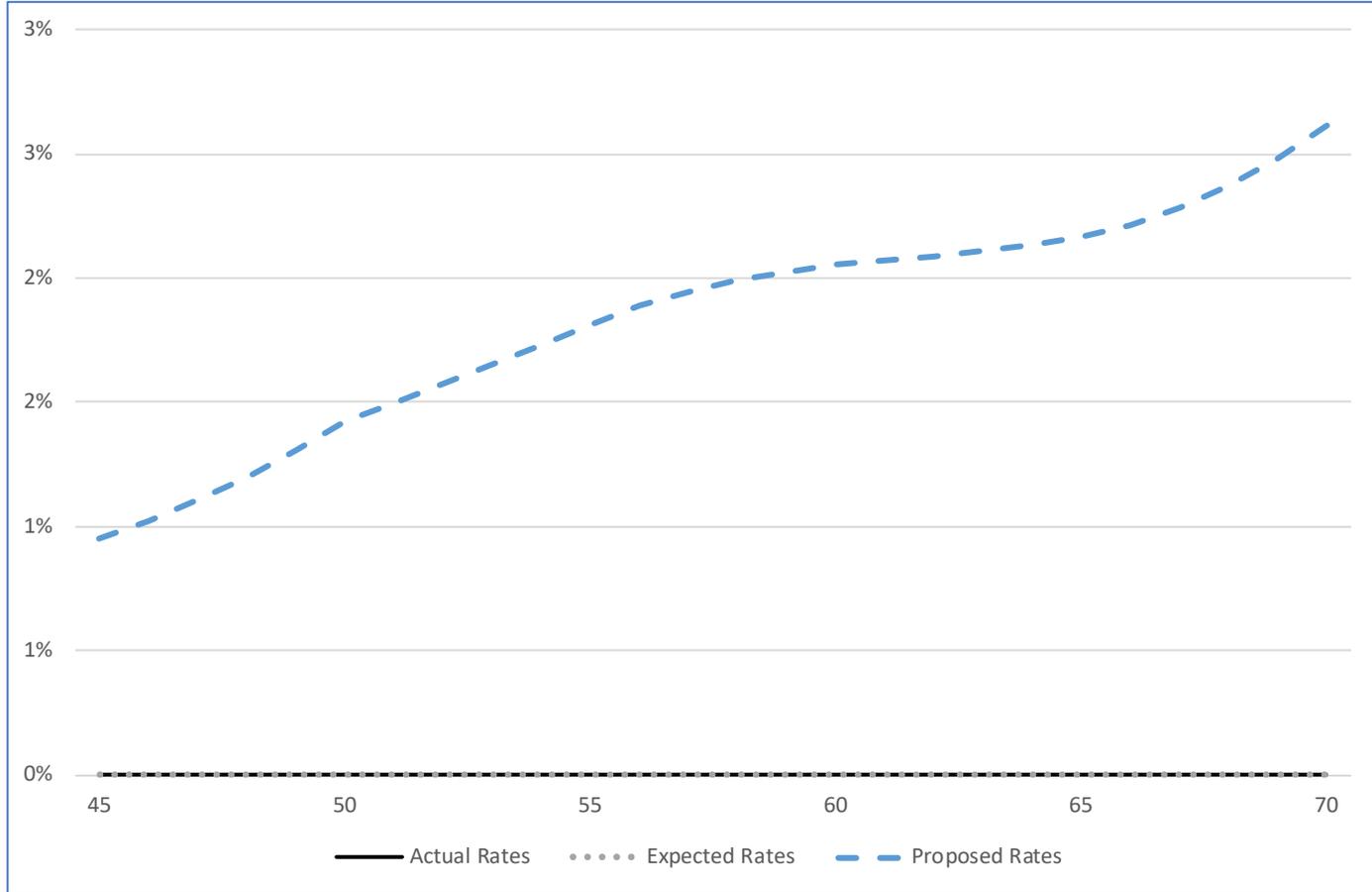


Disabled Mortality JRS Females



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for disability mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.

1			
0.8			
0.6			
0.4			
0.2			
0	0.0	0.0	0.0
	Actual	Expected	Proposed



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; M 115% of rates; F 130% of rates

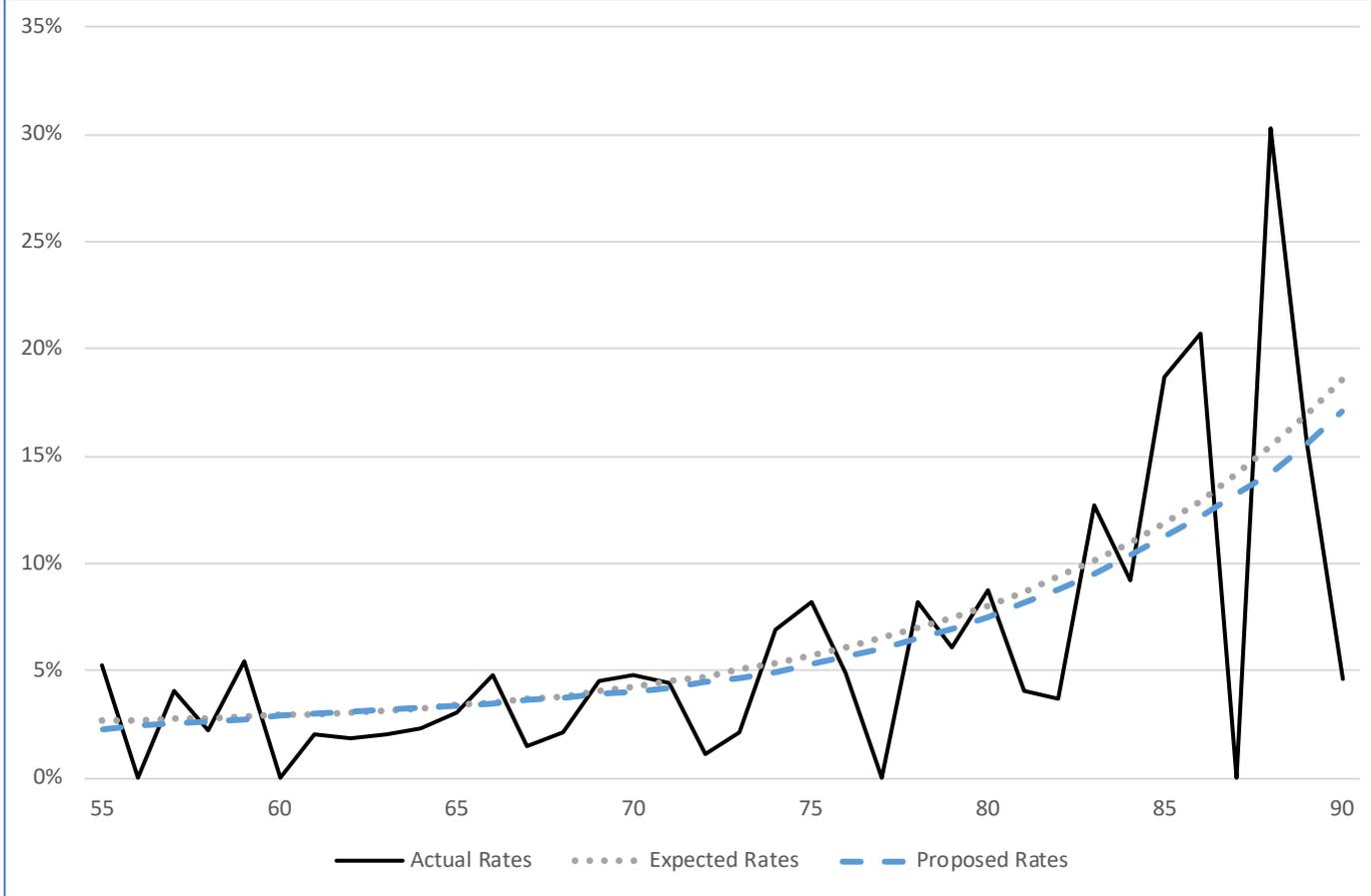
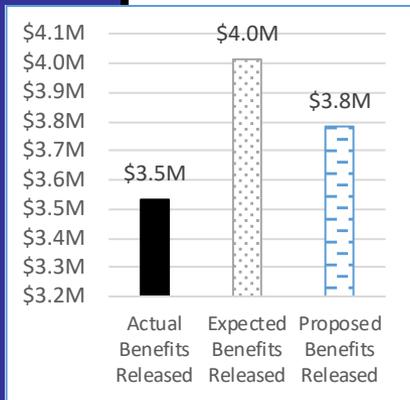
Proposed: Pub2010.Dis - General Females, Modified Mortality Improvement Scale MP-2020



Disabled Mortality Teachers Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; M 115% of rates; F 115% of rates

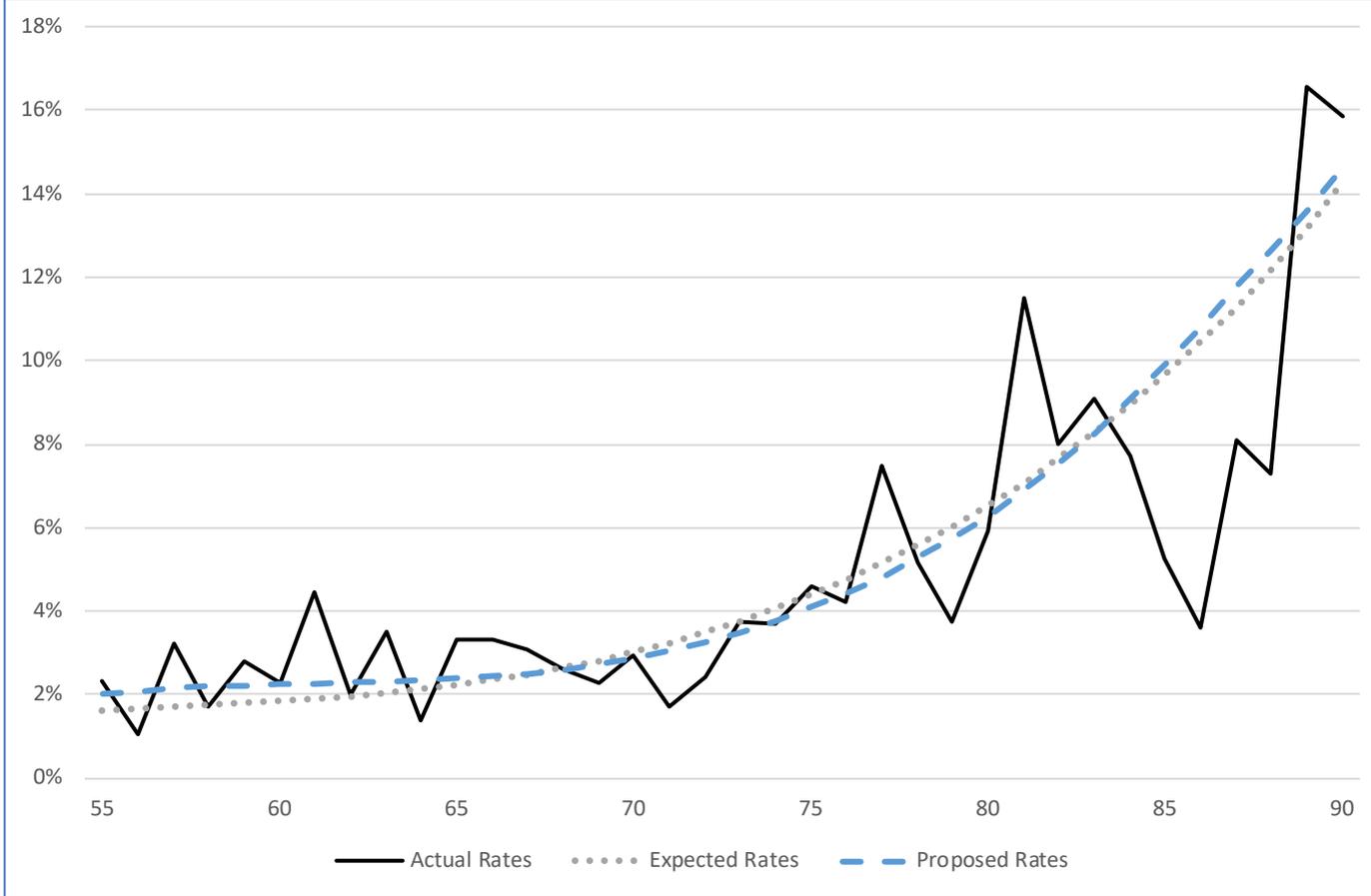
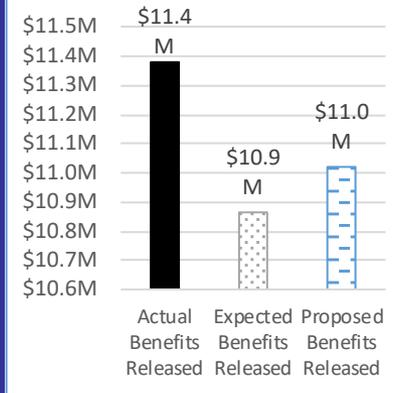
Proposed: Pub2010.Dis - Teachers Males, 110% for all years, Modified Mortality Improvement Scale MP-2020



Disabled Mortality Teachers Females



Comment: Since the last experience review we have released more liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Teacher experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; M 115% of rates; F 115% of rates

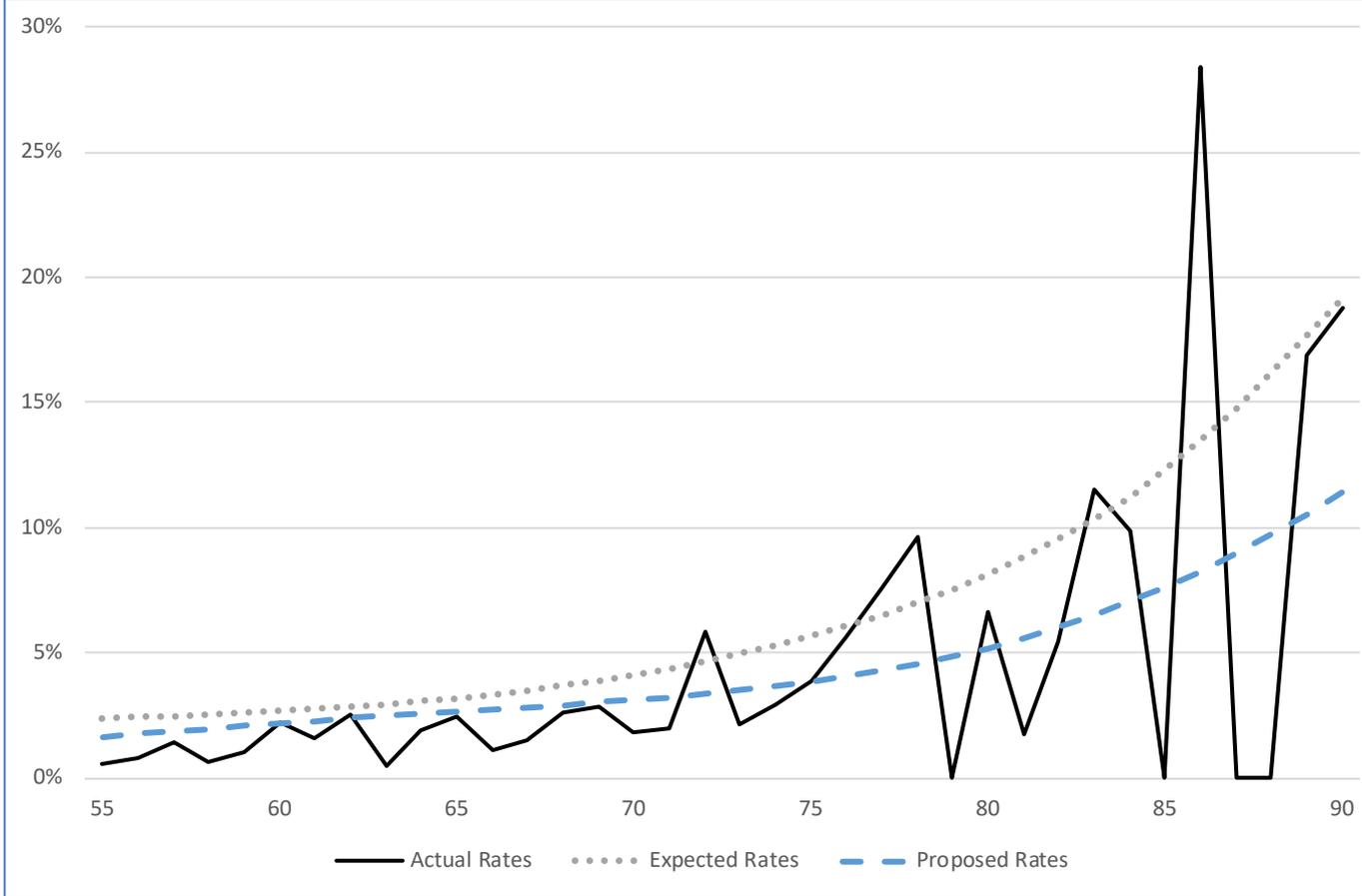
Proposed: Pub2010.Dis - Teachers Females, 110% for all years, Modified Mortality Improvement Scale MP-2020



Disabled Mortality Hazardous Duty Males



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Hazardous Duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; MSF 2yr; Unisex using 100% Male

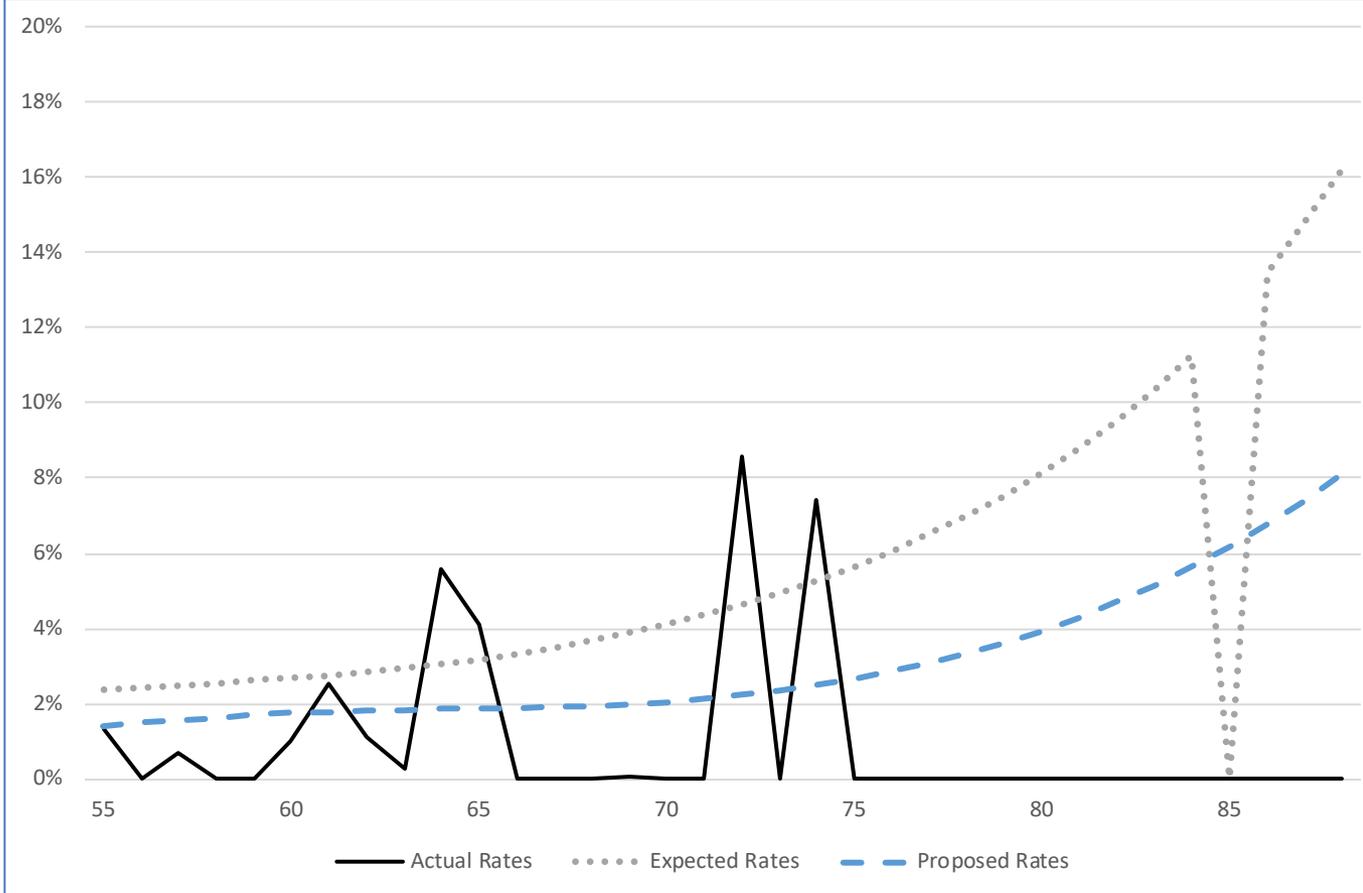
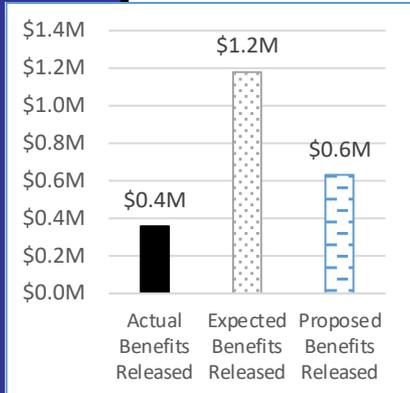
Proposed: Pub2010.Dis - General Males, 95% for all years, set back 3 years, Modified Mortality Improvement Scale MP-2020



Disabled Mortality Hazardous Duty Females



Comment: Since the last experience review we have released less liability due to death than expected. We recommend a PUB2010 public sector mortality table, modified to reflect recent Hazardous Duty experience, which results in expected liability release being closer to actual. For future mortality improvements, we recommend replacing the current load with a modified Mortality Improvement Scale MP-2020.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; MSF 2yr; Unisex using 100% Male

Proposed: Pub2010.Dis - General Females, 95% for all years, set back 3 years, Modified Mortality Improvement Scale MP-2020

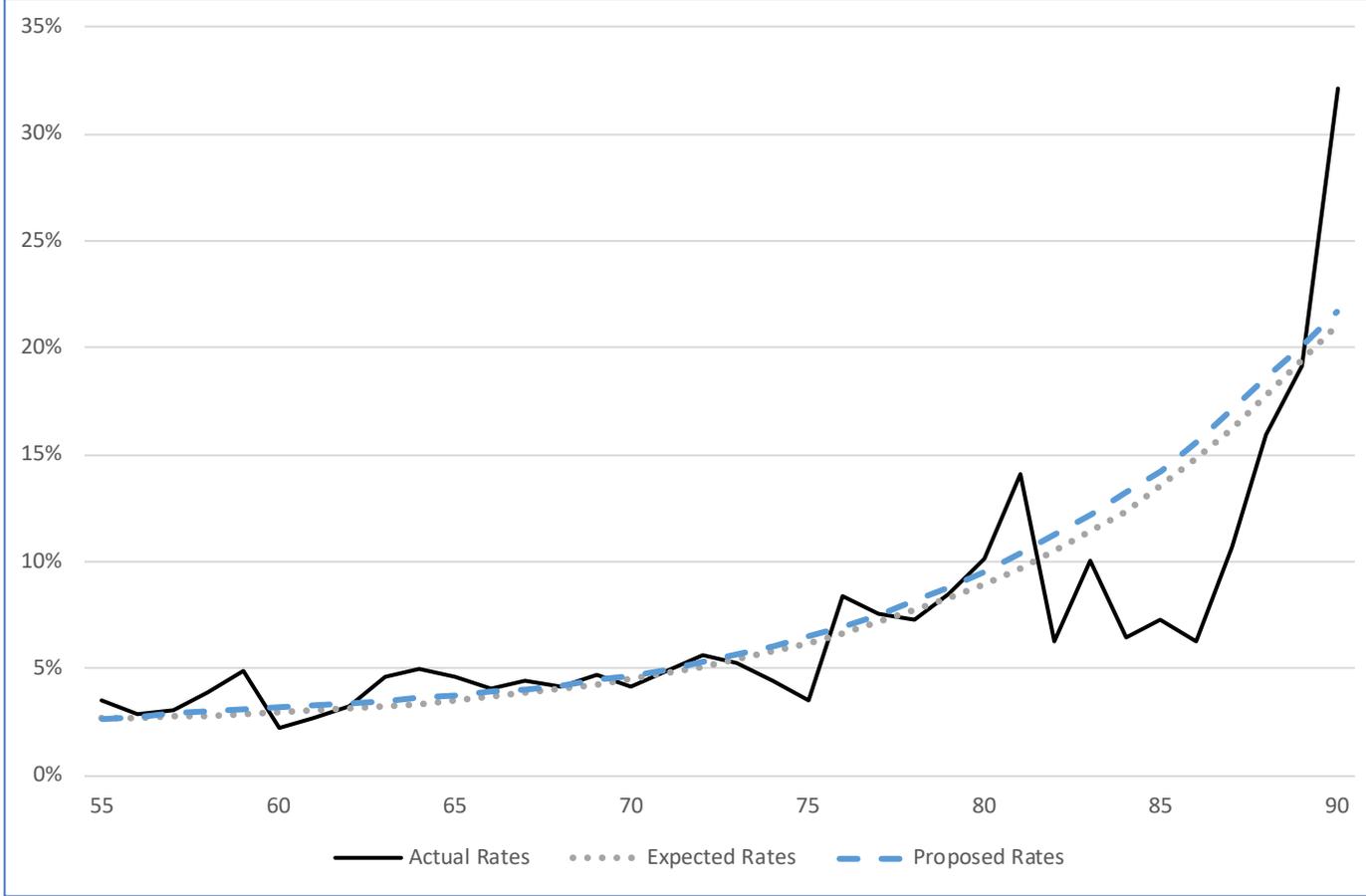
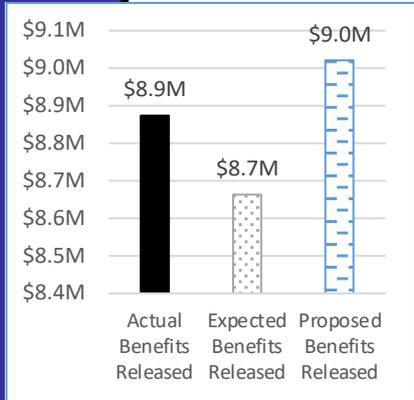


Disabled Mortality

Political Subdivisions Non Hazardous Duty Males



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for disability mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; MSF 2yr, 115% of rates; F 125% of rates

Proposed: Pub2010.Dis - General Males, 110% for all years, set forward 3 years, Modified Mortality Improvement Scale MP-2020

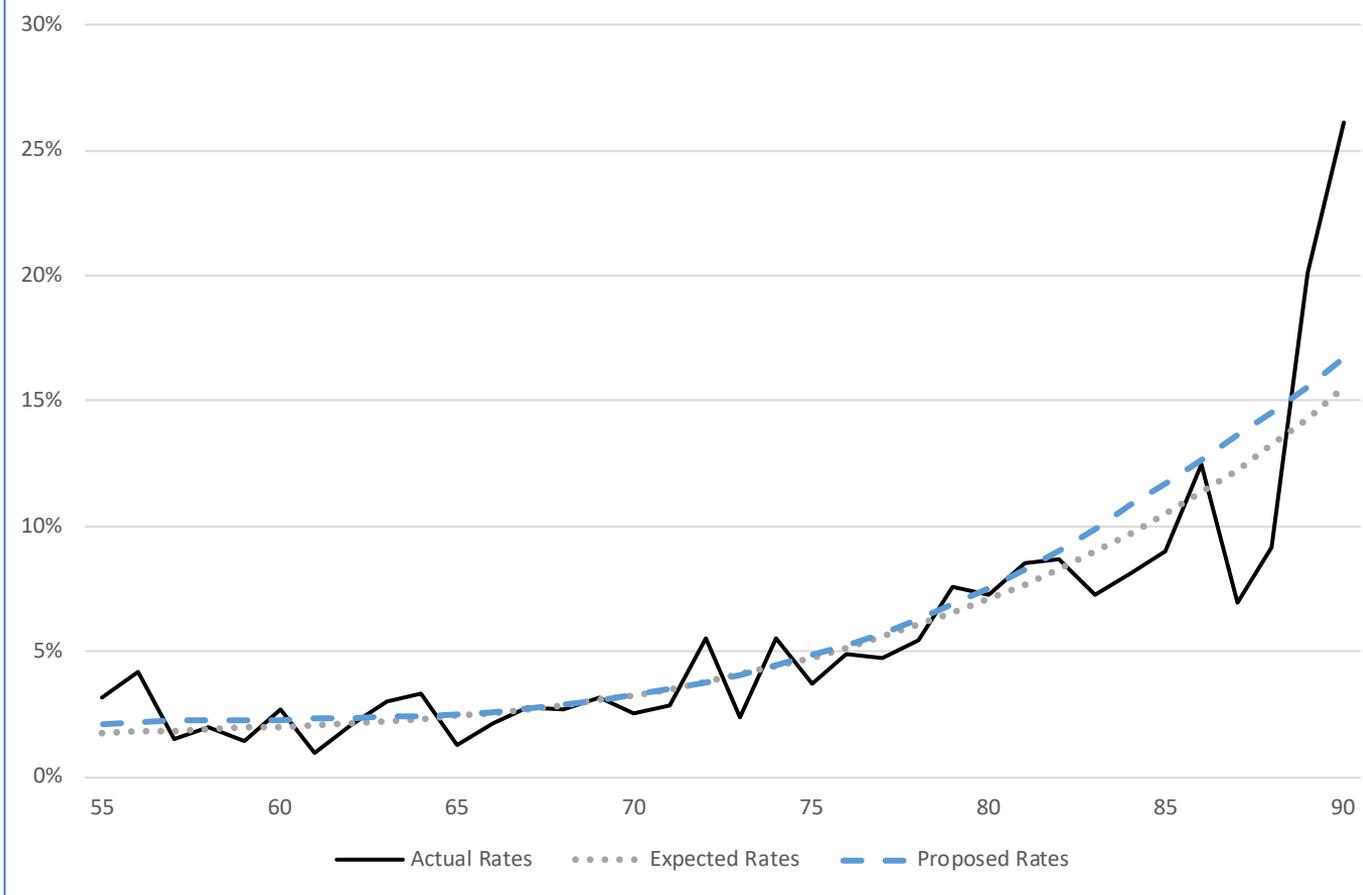
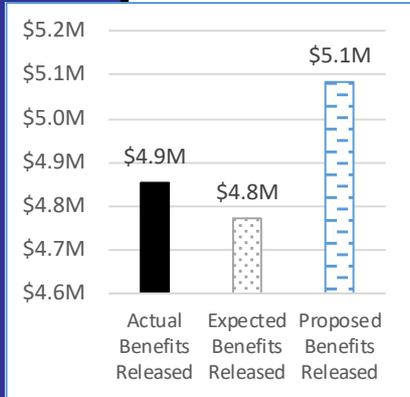


Disabled Mortality

Political Subdivisions Non Hazardous Duty Females



Comment: Because we are switching to a new set of tables (PUB2010) and adding in a generational mortality component, some groups may not match as closely as others. Due to the small amount of credibility for disability mortality it is harder to get a good fit for all groups and we did not want to overengineer the tables and thus imply more credibility to the results than exists.



Expected: RP-2014 Disabled Mortality Rates Projected BB to 2020; MSF 2yr, 115% of rates; F 125% of rates

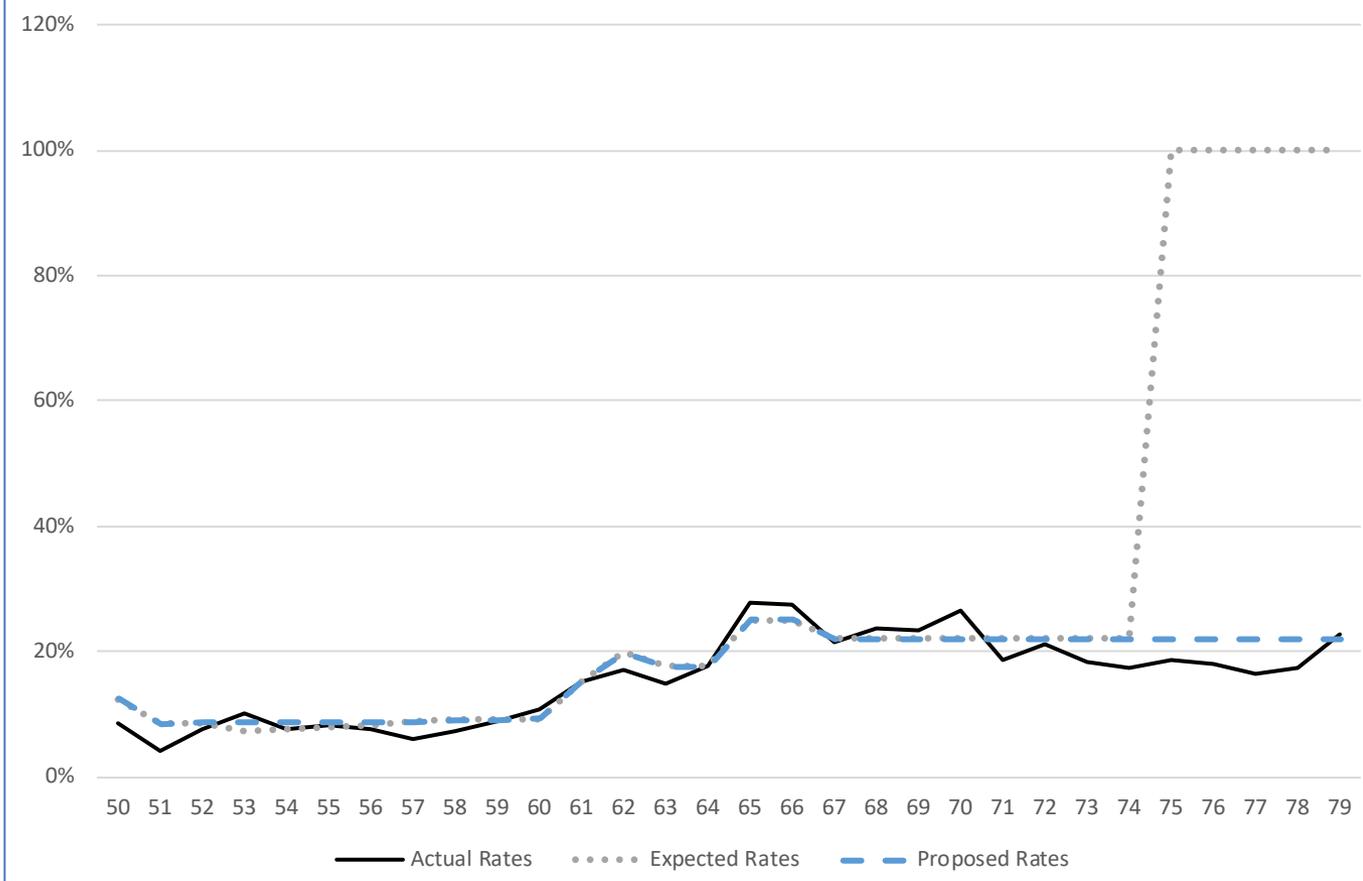
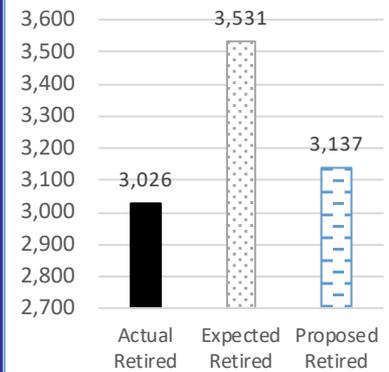
Proposed: Pub2010.Dis - General Females, 110% for all years, set forward 2 years, Modified Mortality Improvement Scale MP-2020



Retirement Rates - Eligible for Unreduced State Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

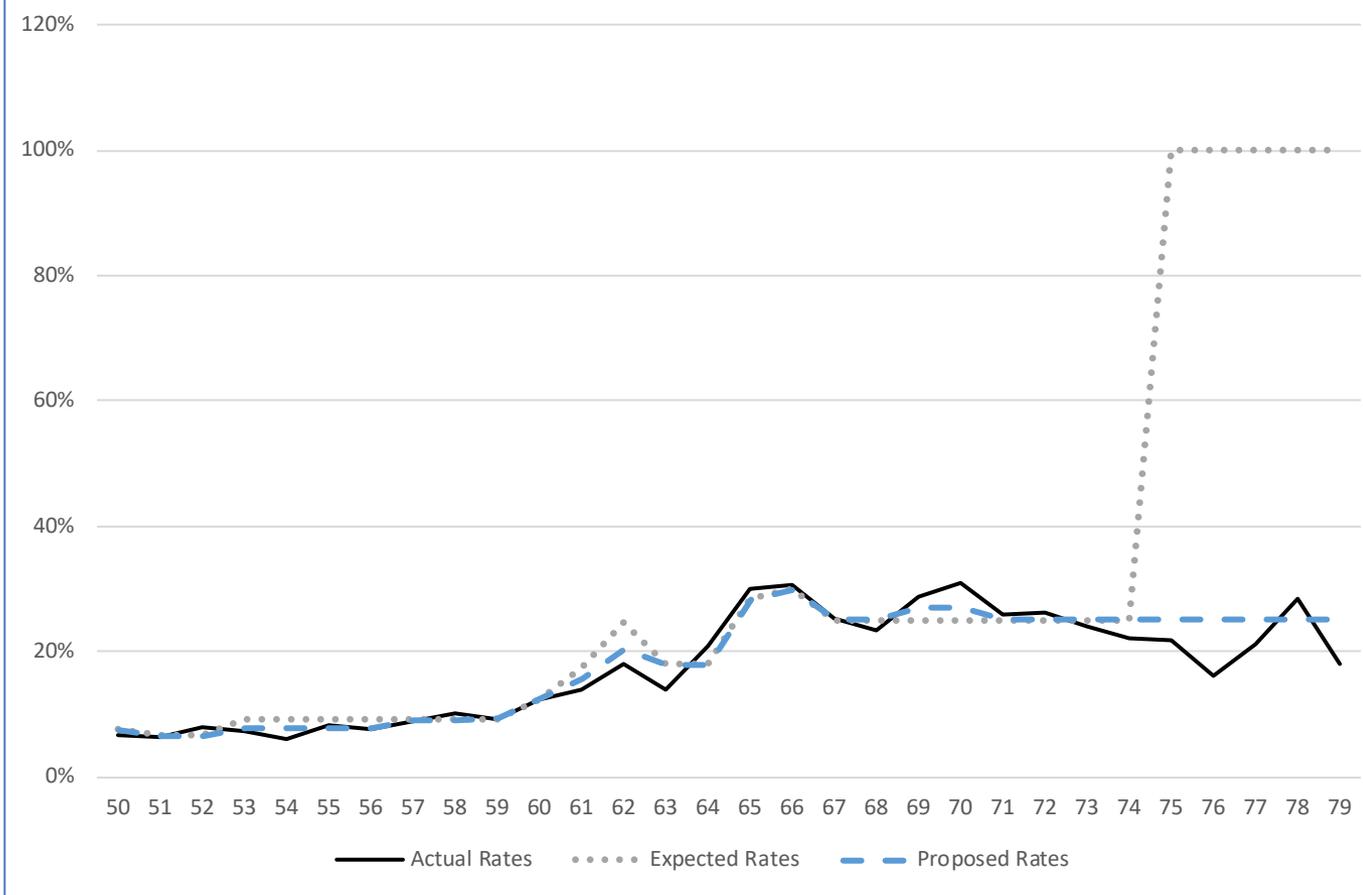
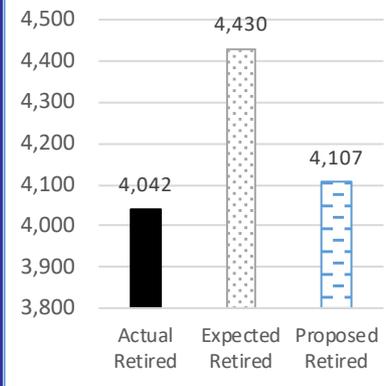




Retirement Rates - Eligible for Unreduced State Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

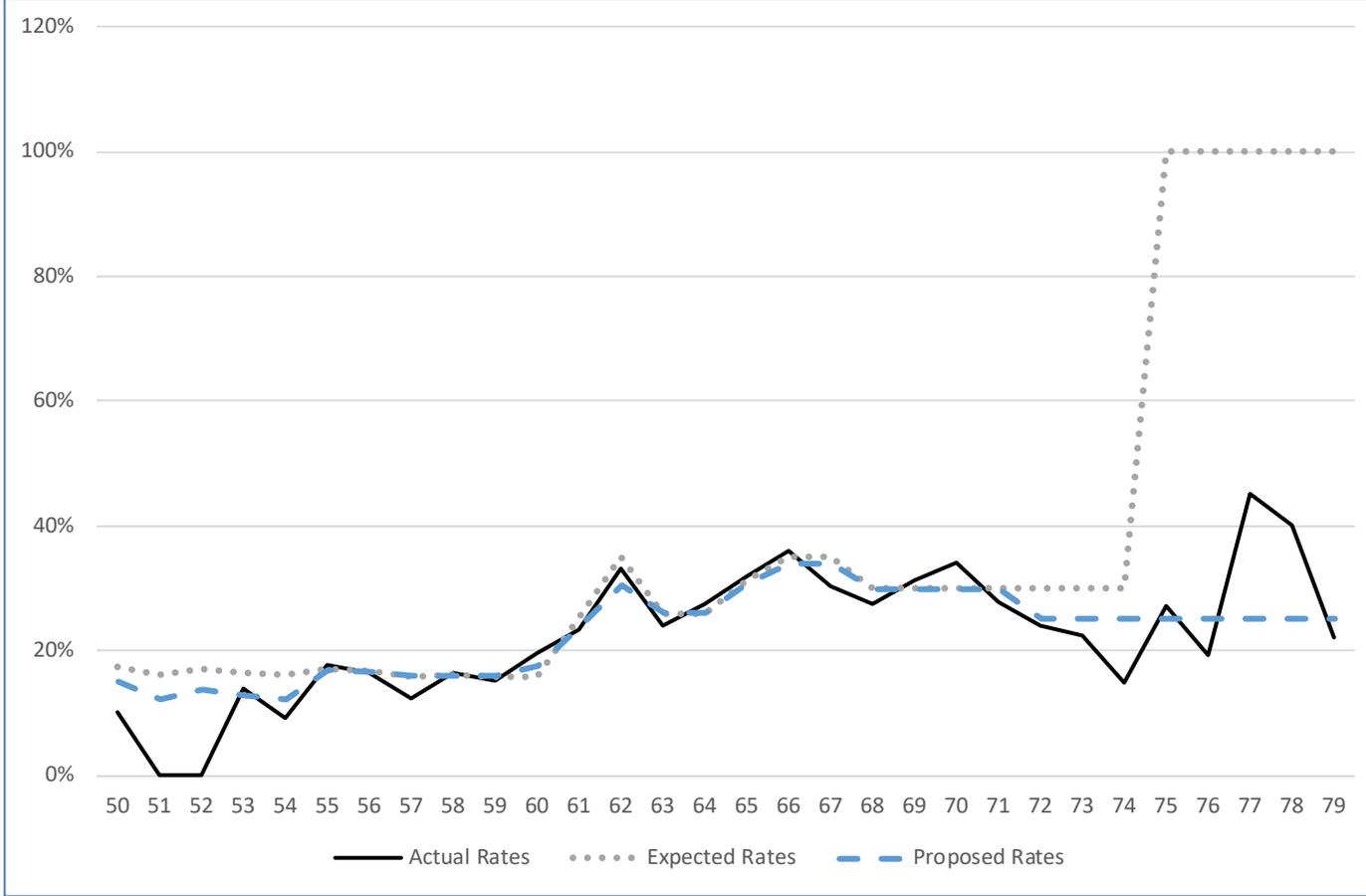
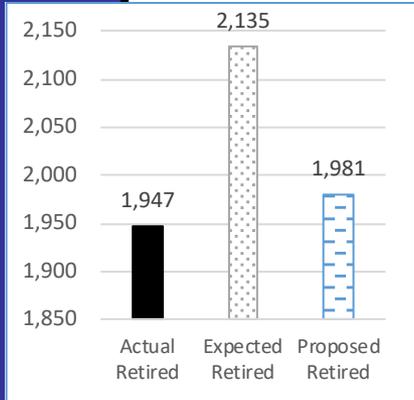




Retirement Rates - Eligible for Unreduced Teachers Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

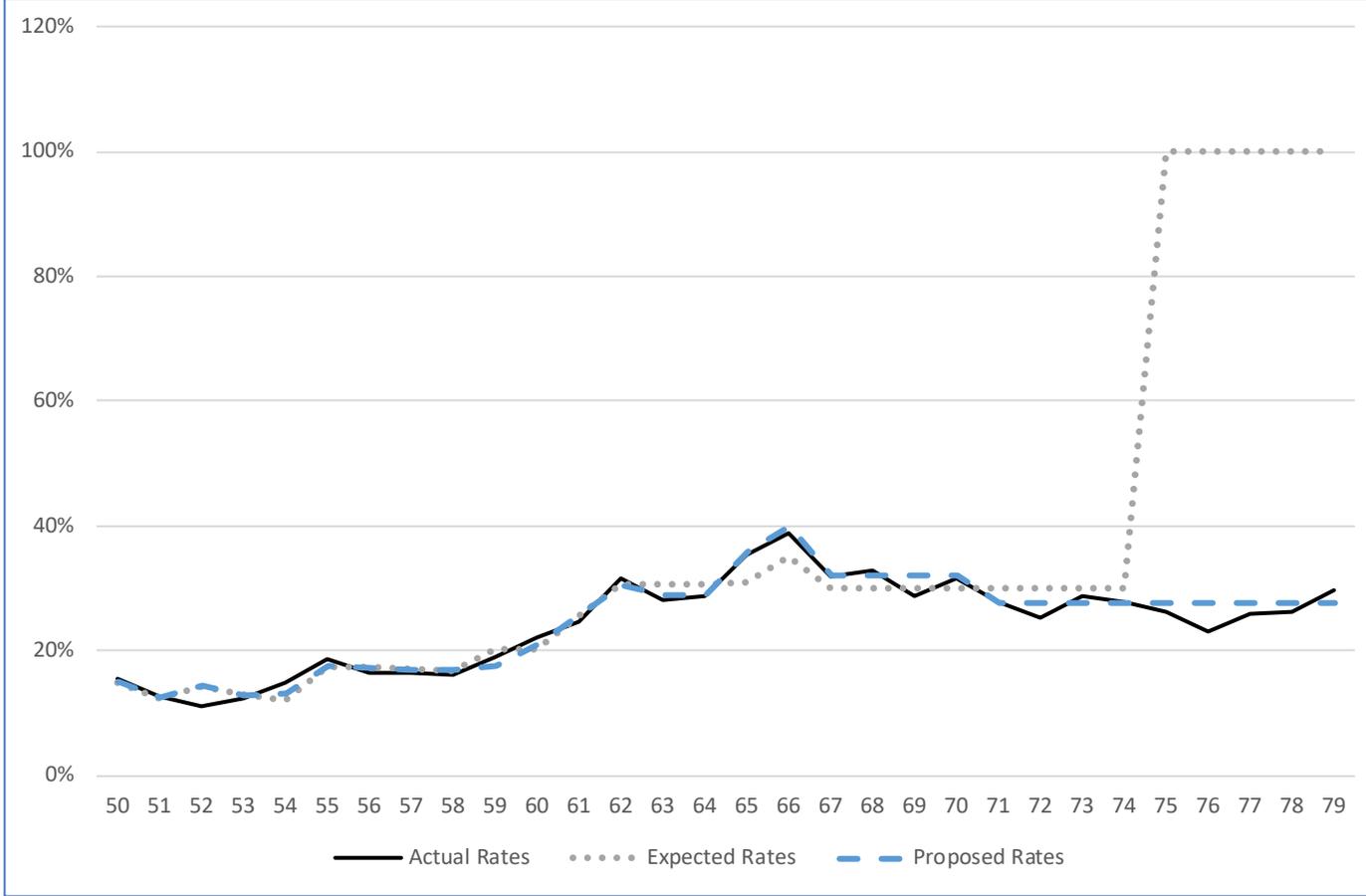
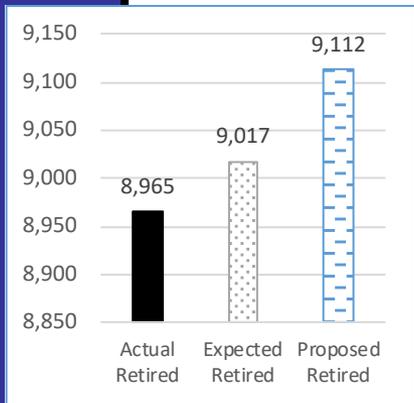




Retirement Rates - Eligible for Unreduced Teachers Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80. There are still a number members who continue to work past age 80.

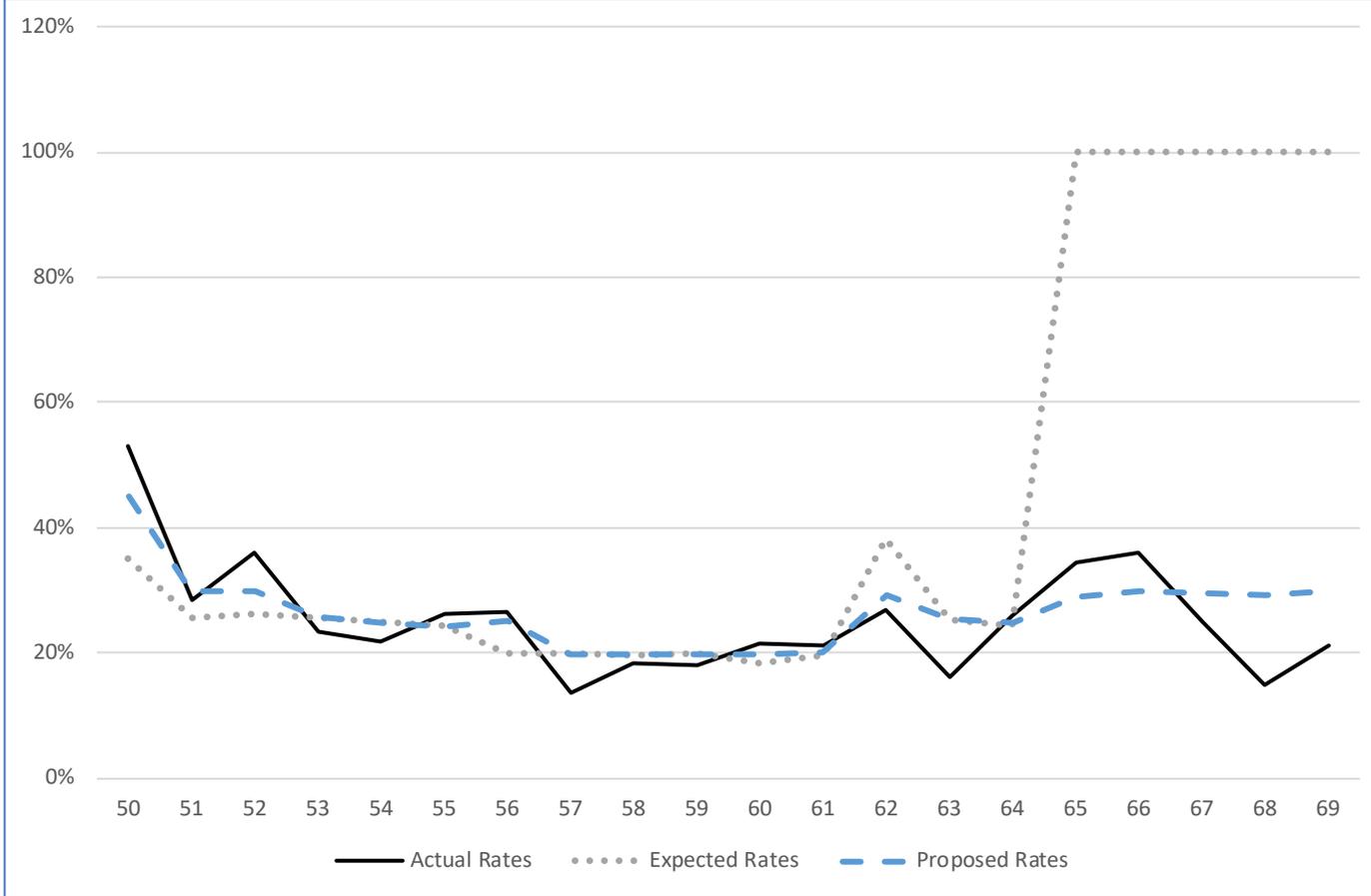
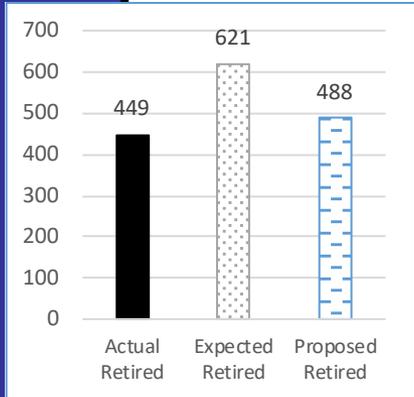




Retirement Rates - Eligible for Unreduced VaLORS Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.

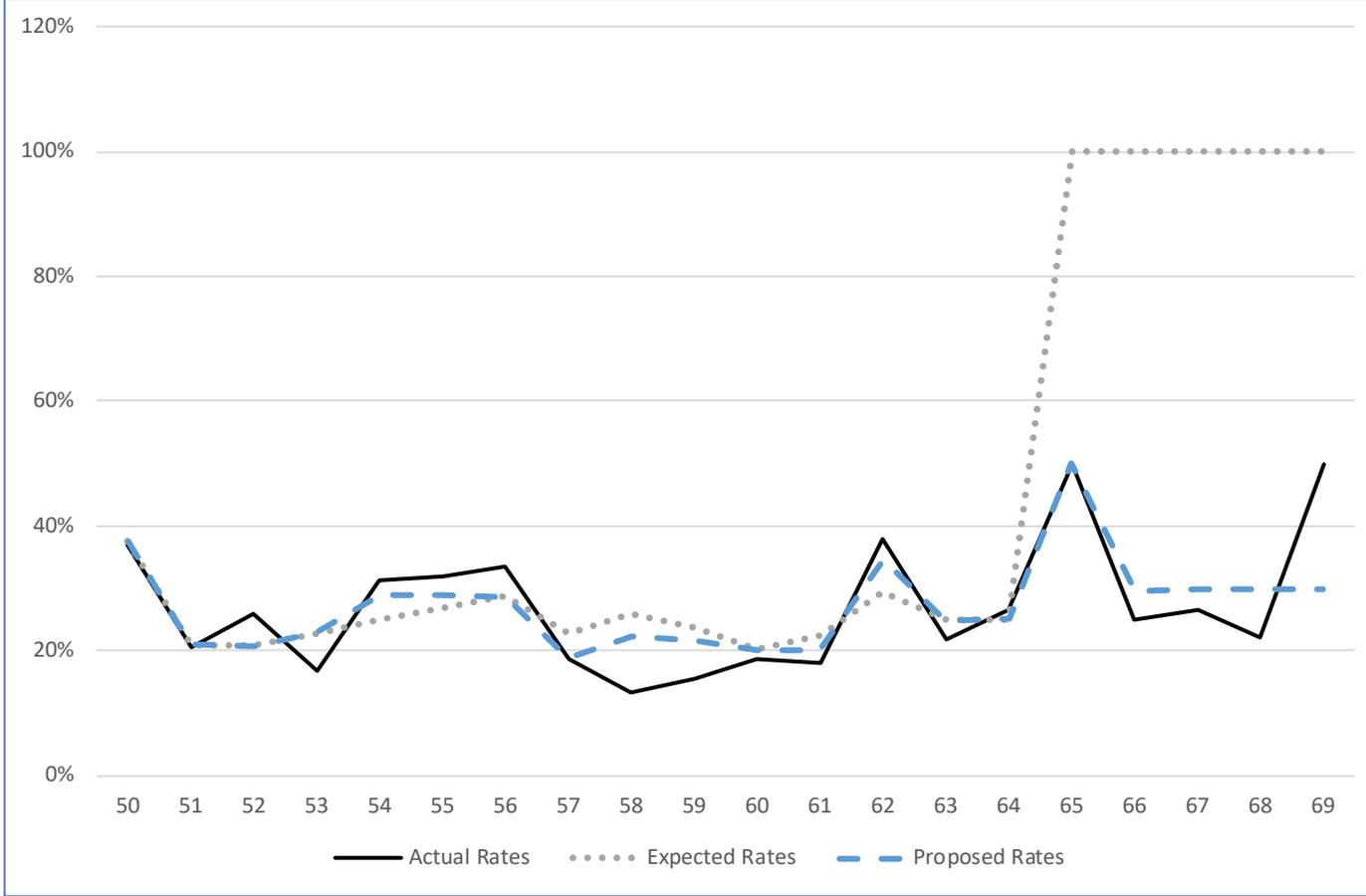
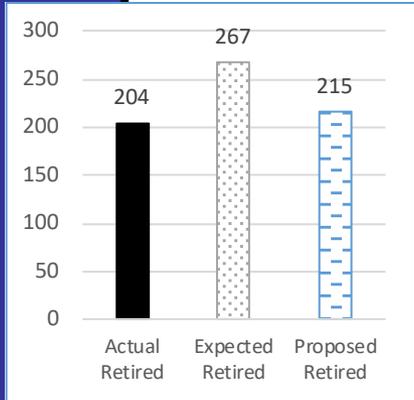




Retirement Rates - Eligible for Unreduced VaLORS Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.



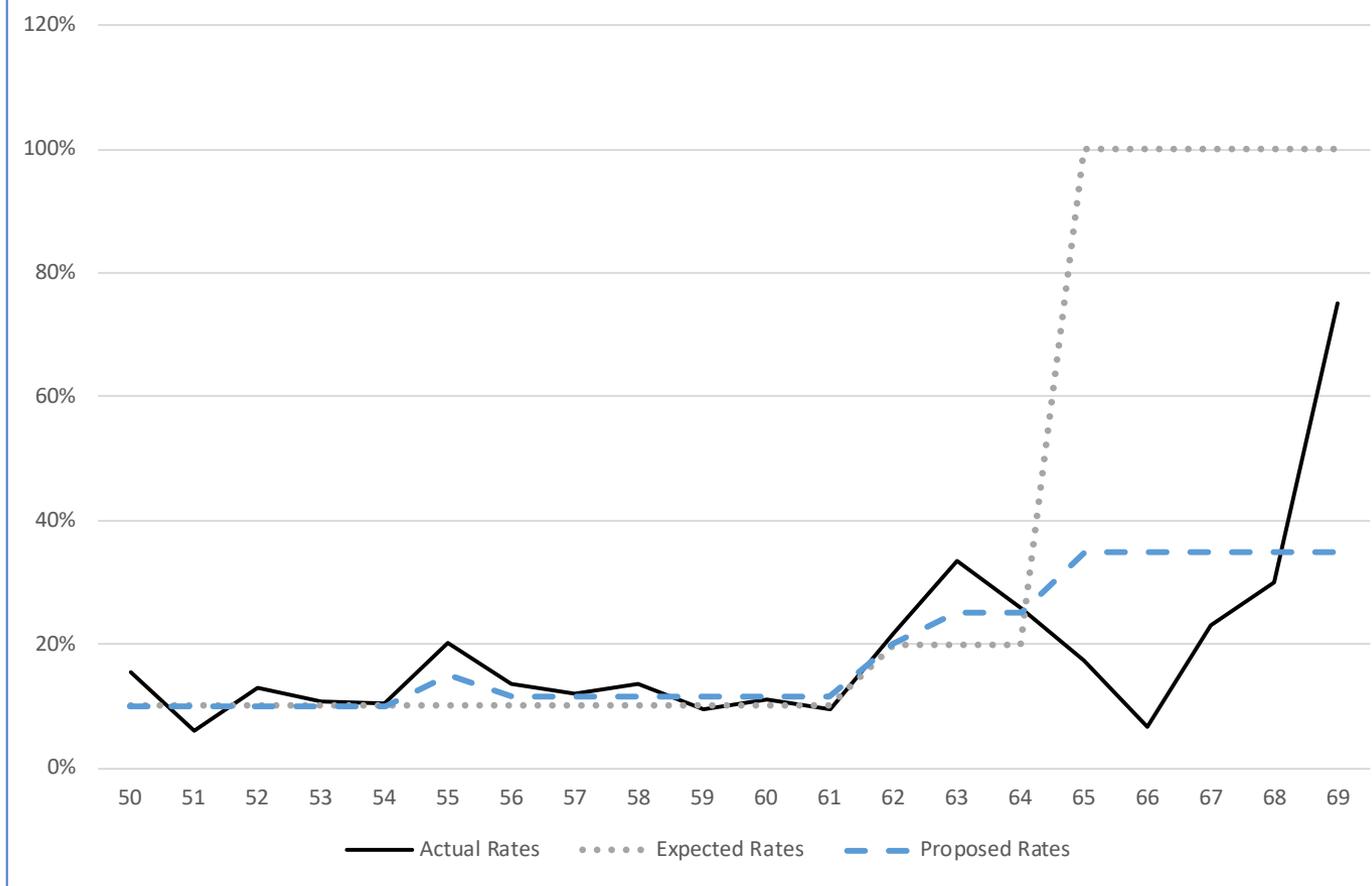
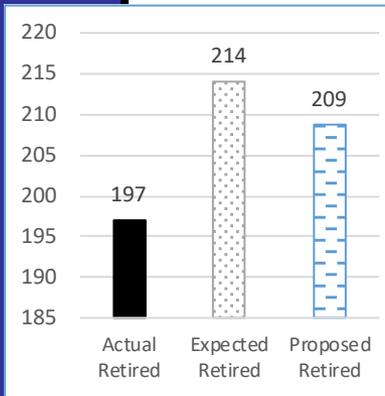


Retirement Rates - Eligible for Unreduced SPORS

Males and Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.



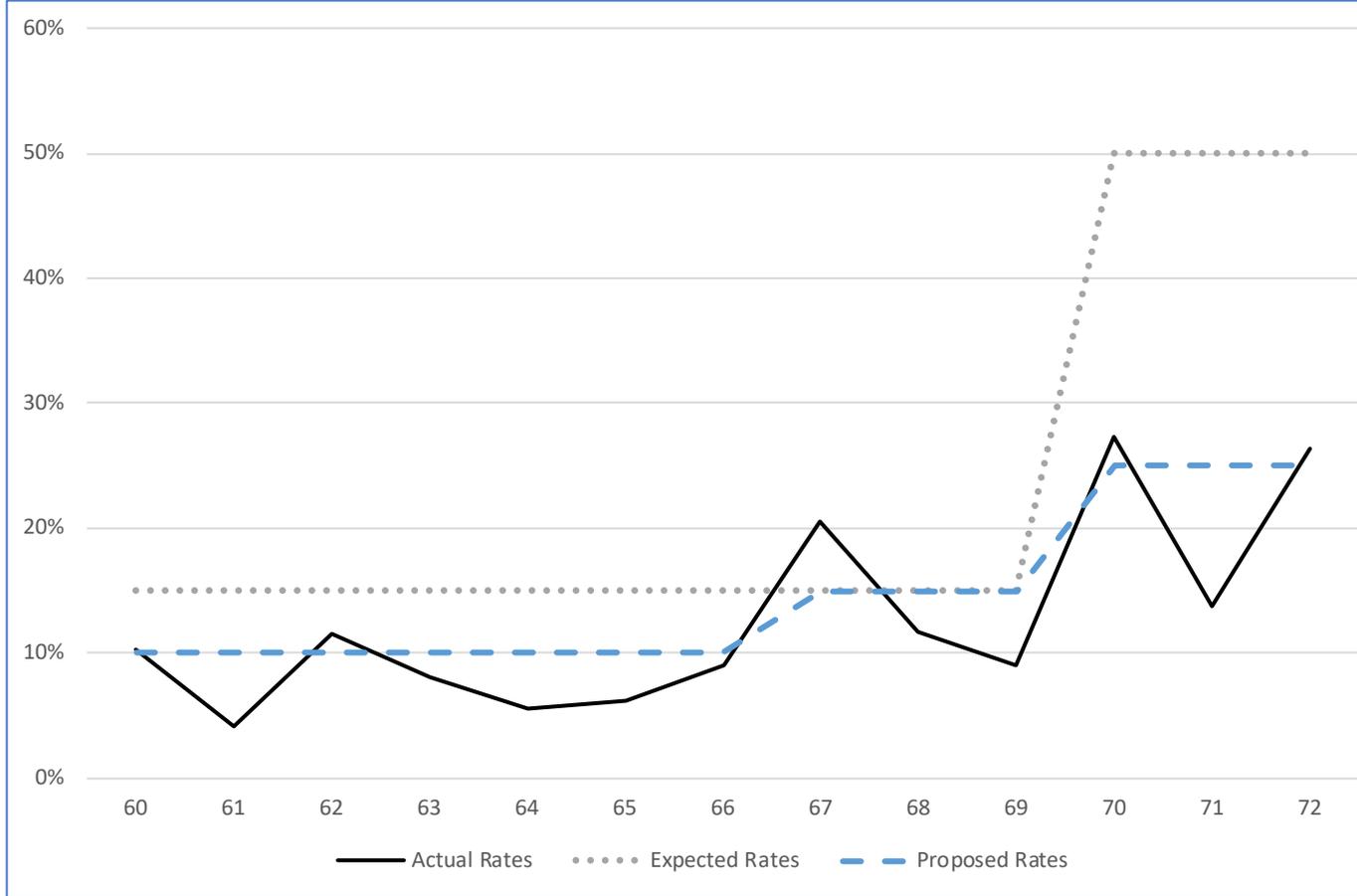
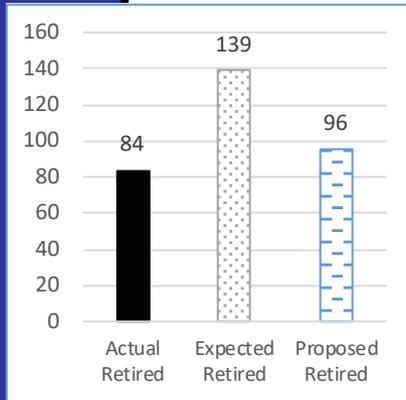


Retirement Rates - Eligible for Unreduced JRS

Males and Females



Comment: Rates adjusted to be closer to experience since the last experience review.

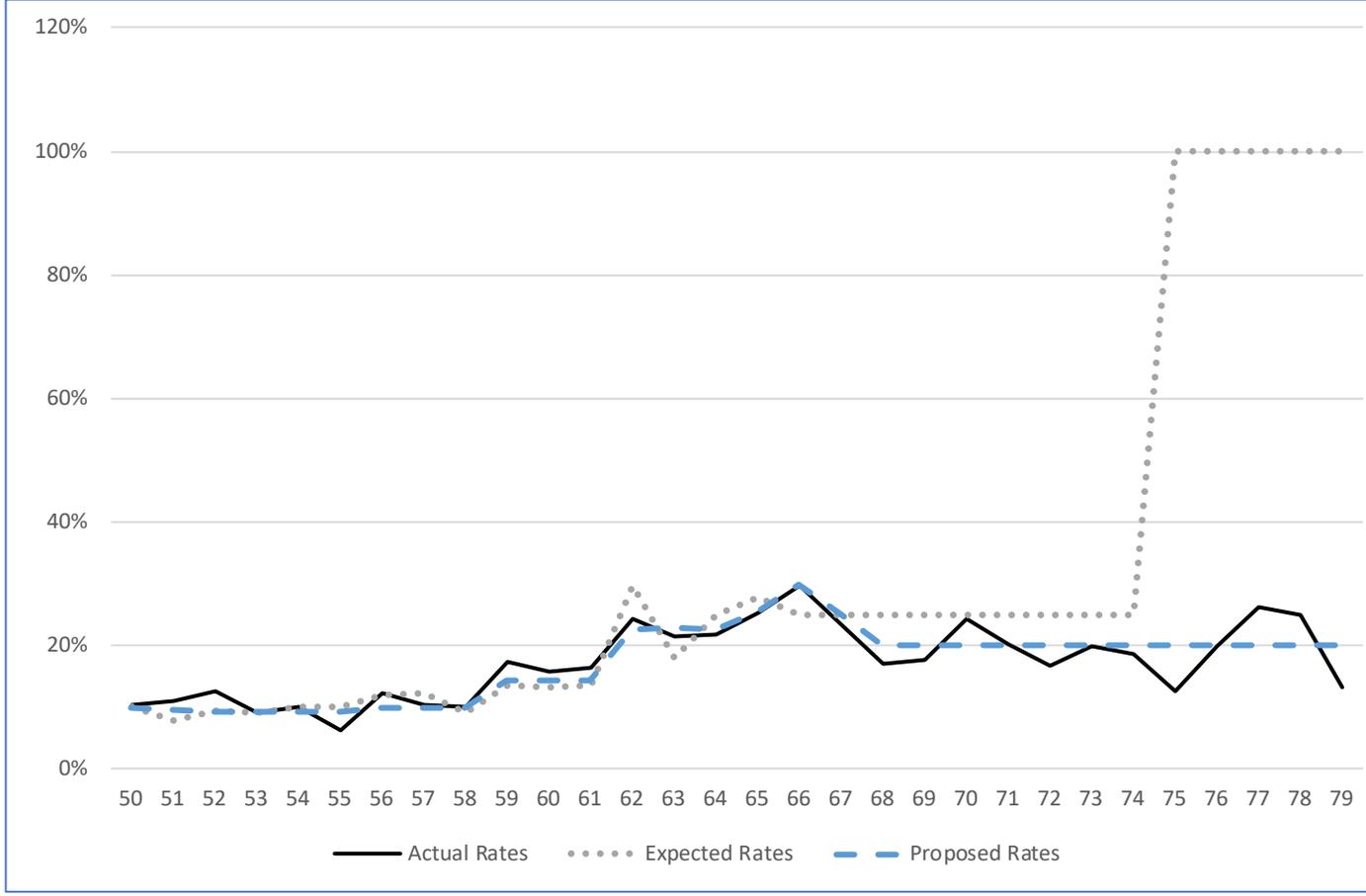
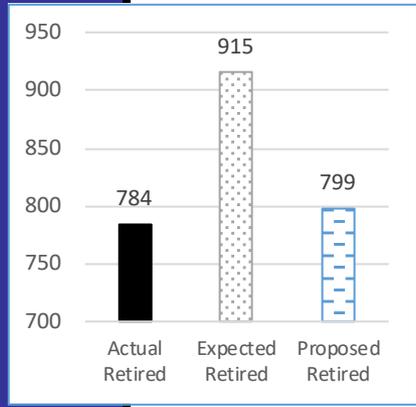




Retirement Rates - Eligible for Unreduced Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

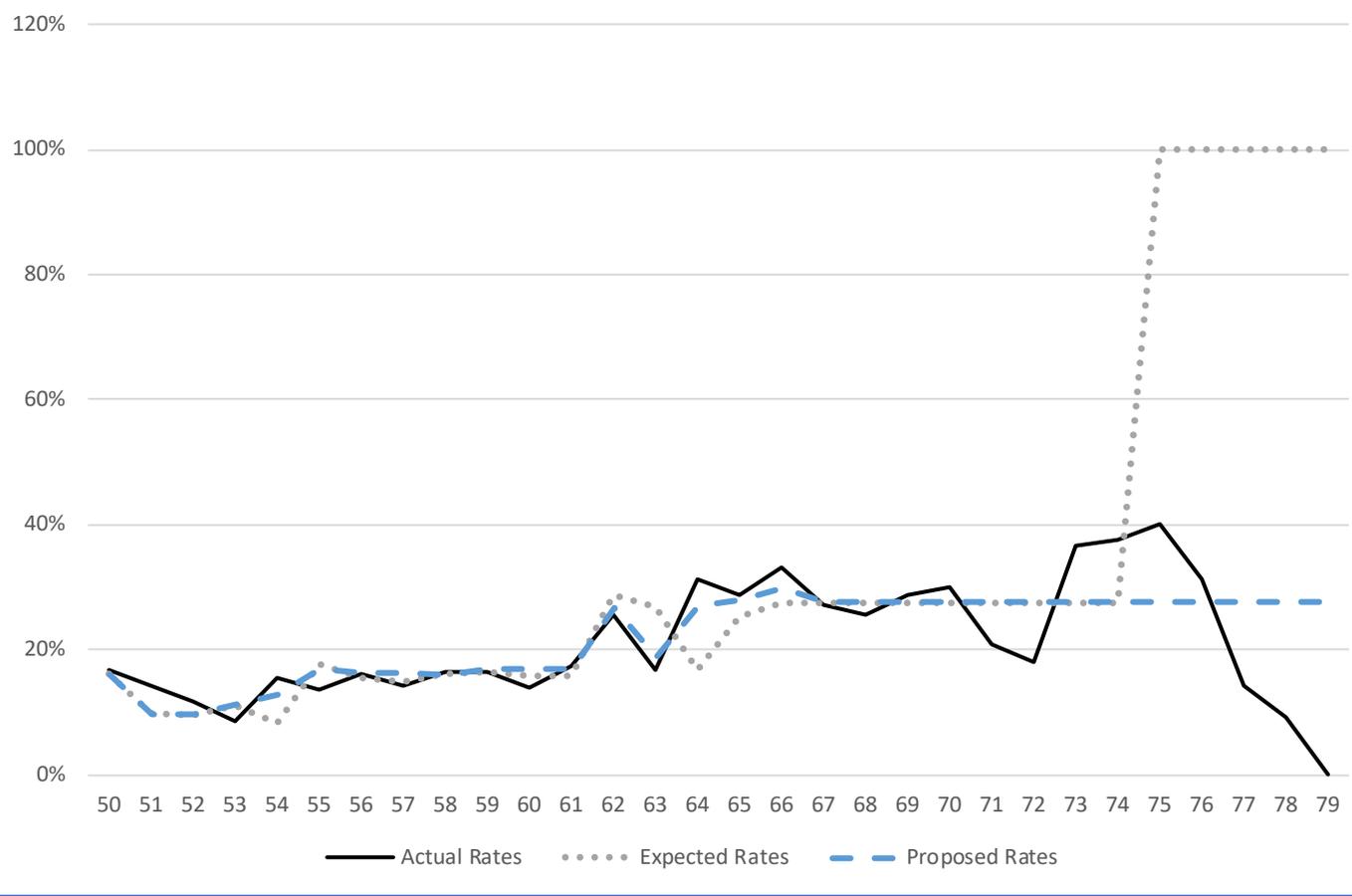
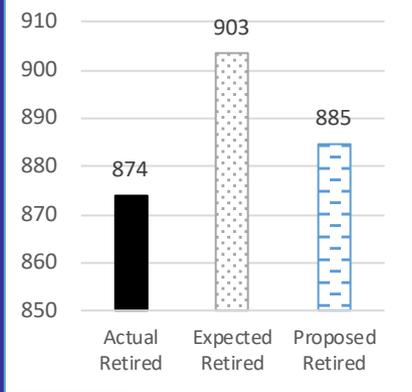




Retirement Rates - Eligible for Unreduced Top 10 Non Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

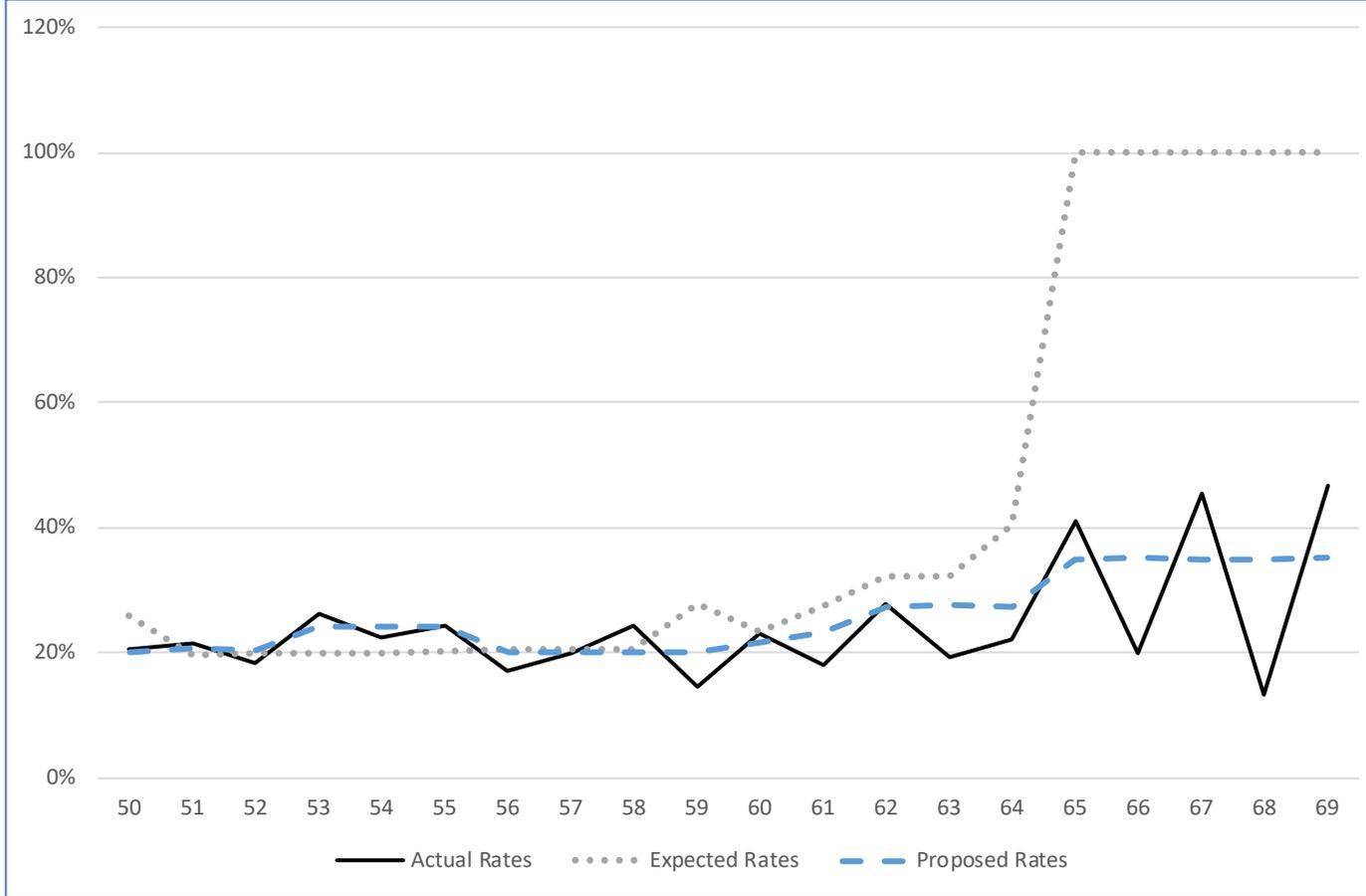
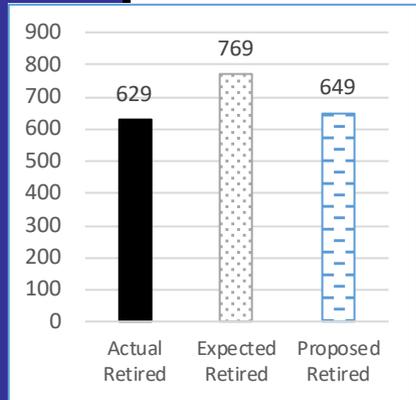




Retirement Rates - Eligible for Unreduced Top 10 Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.

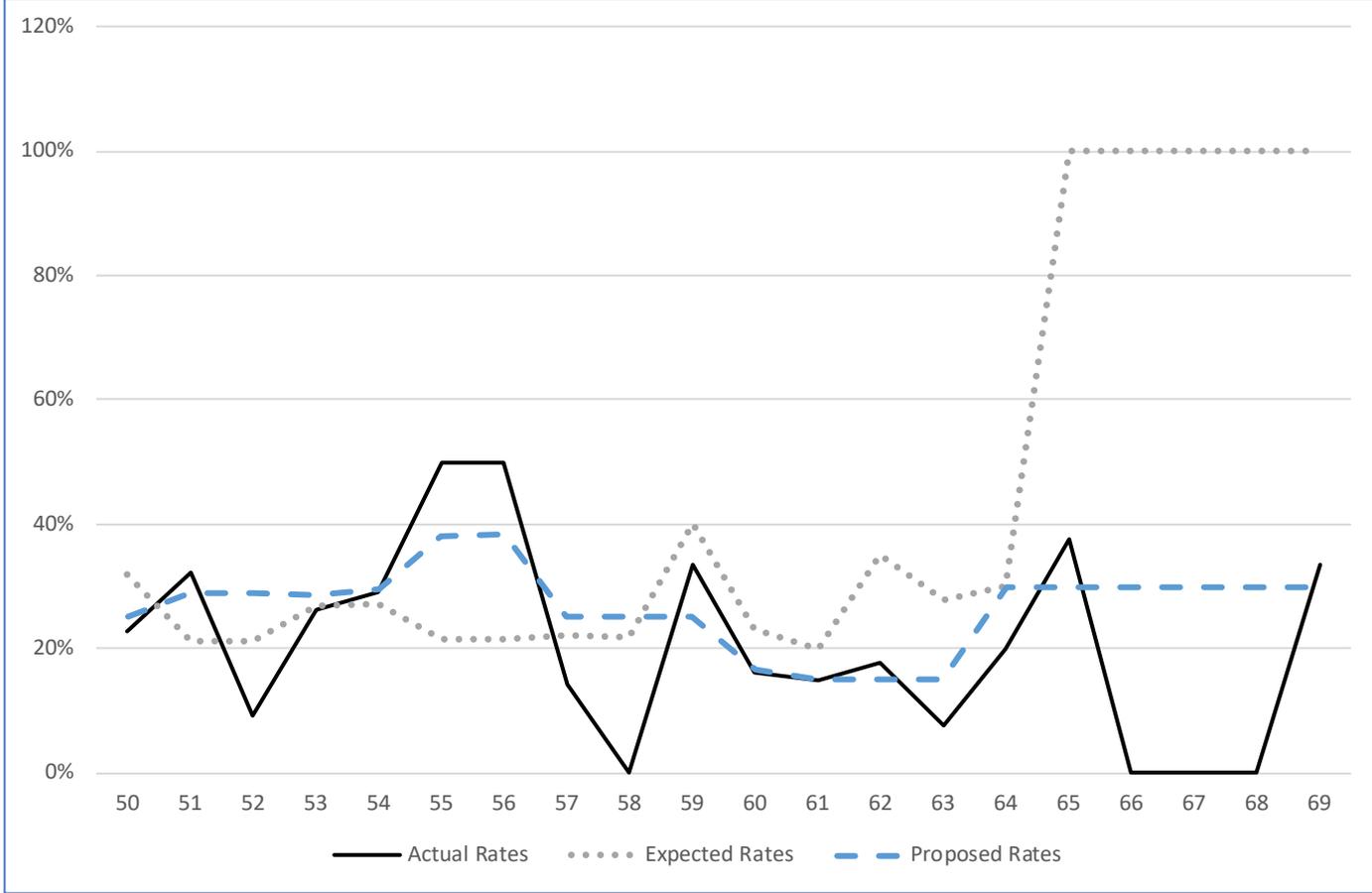
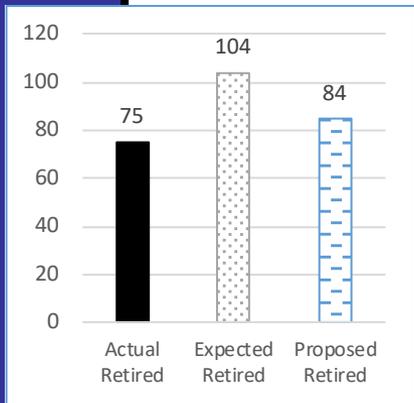




Retirement Rates - Eligible for Unreduced Top 10 Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.

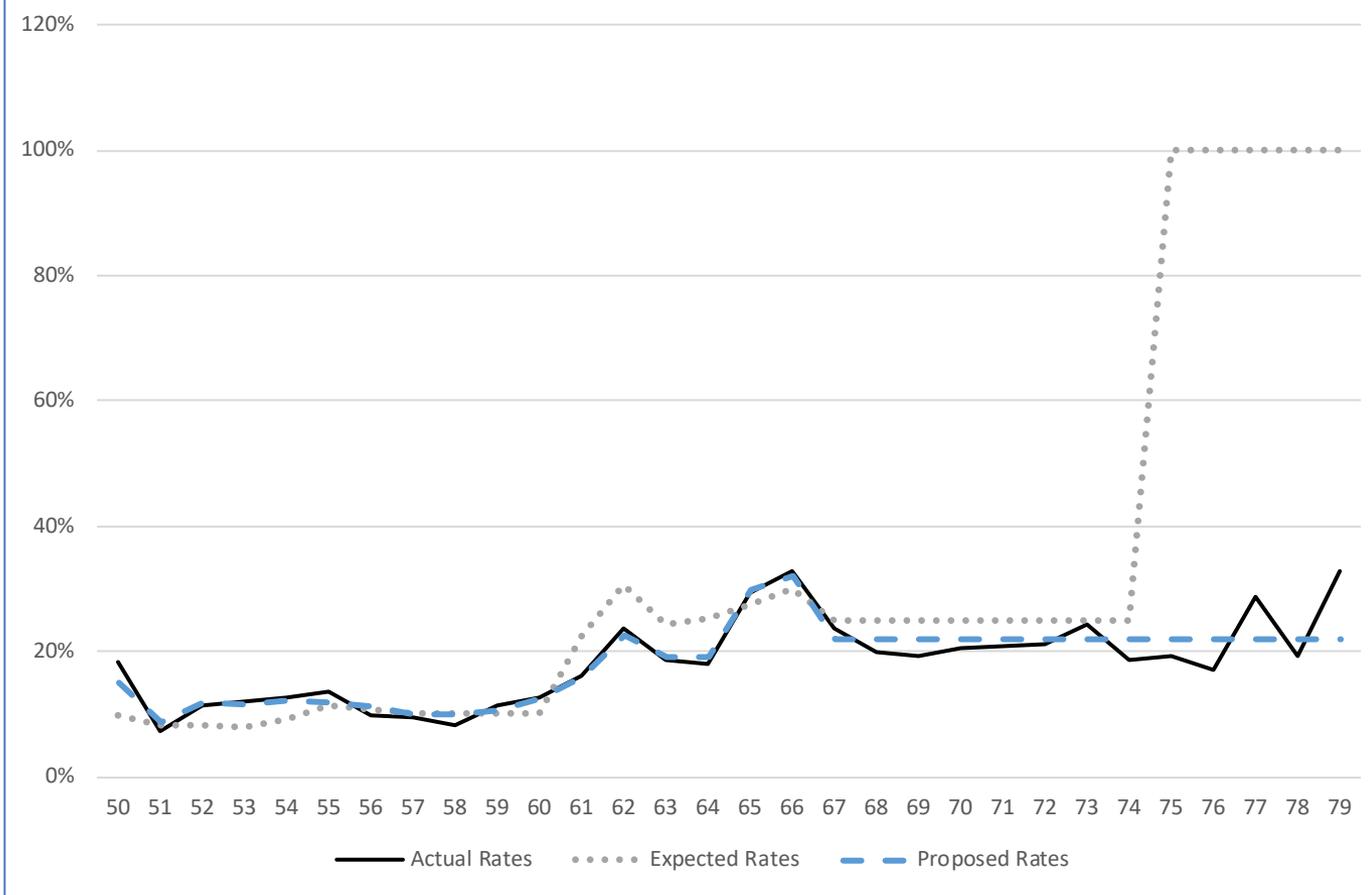
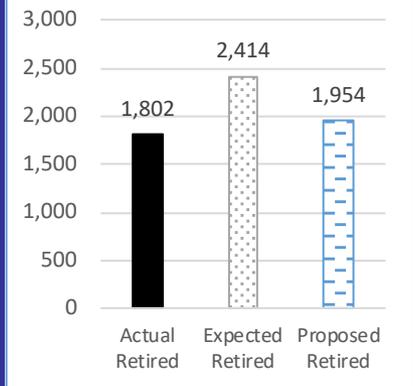




Retirement Rates - Eligible for Unreduced Non Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

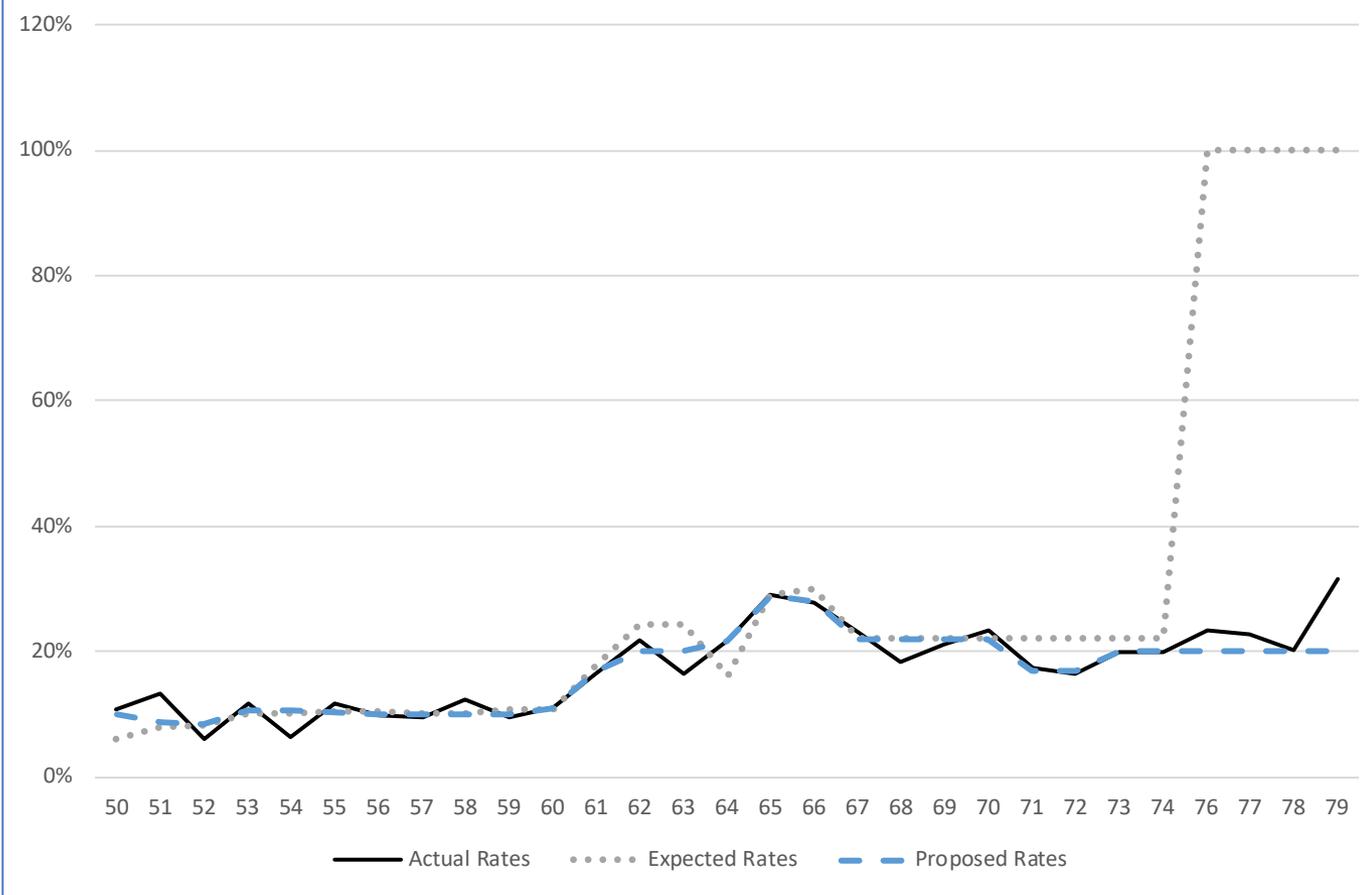
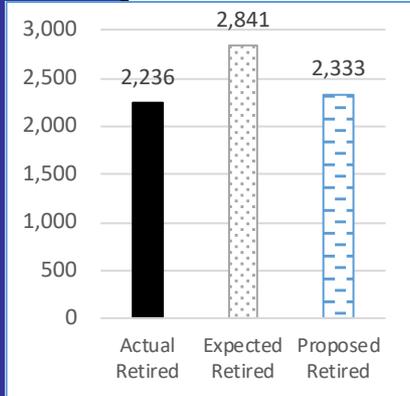




Retirement Rates - Eligible for Unreduced Non Top 10 Non Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 80.

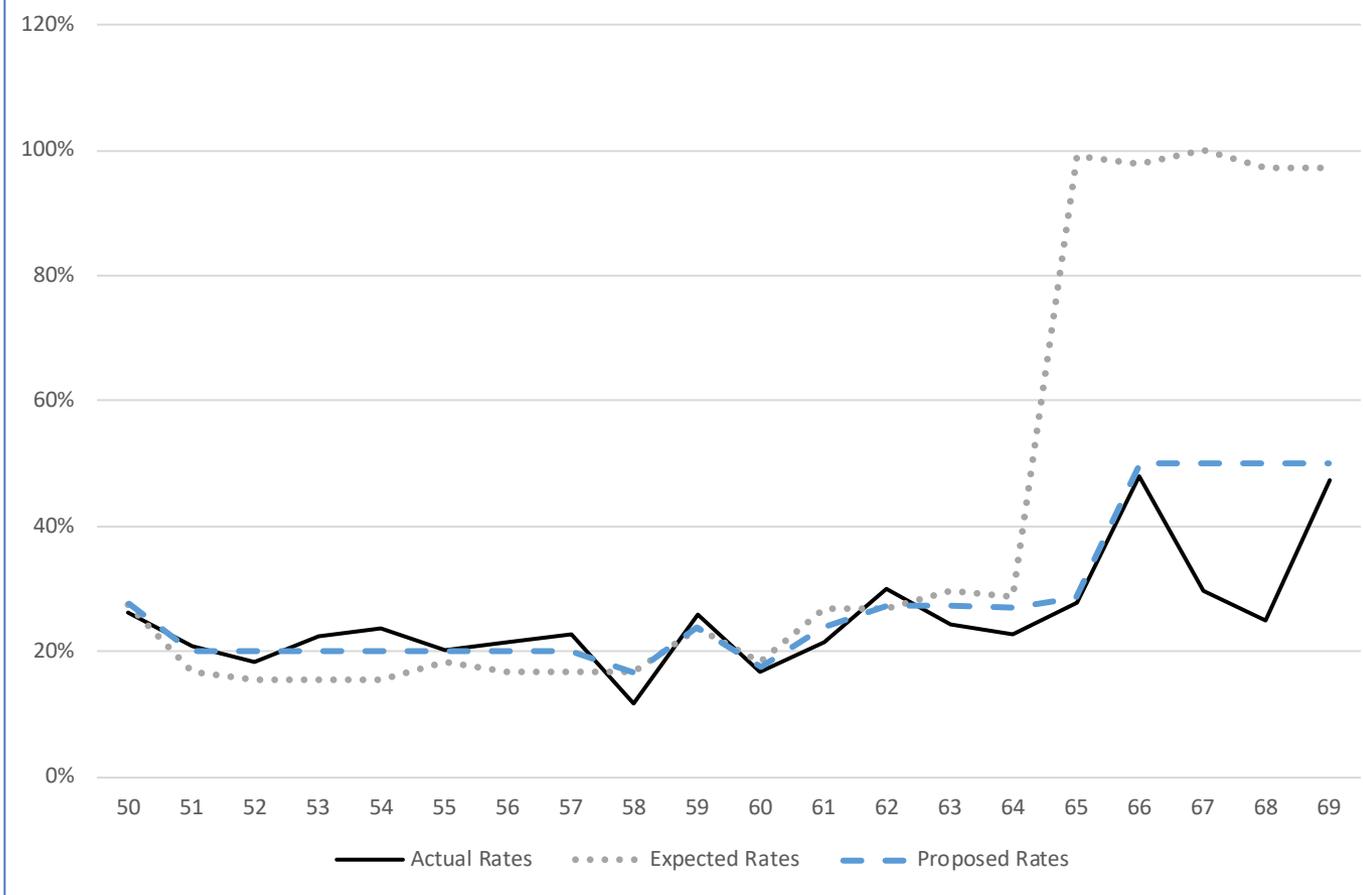
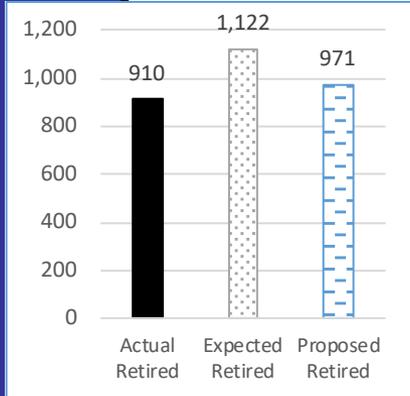




Retirement Rates - Eligible for Unreduced Non Top 10 Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.

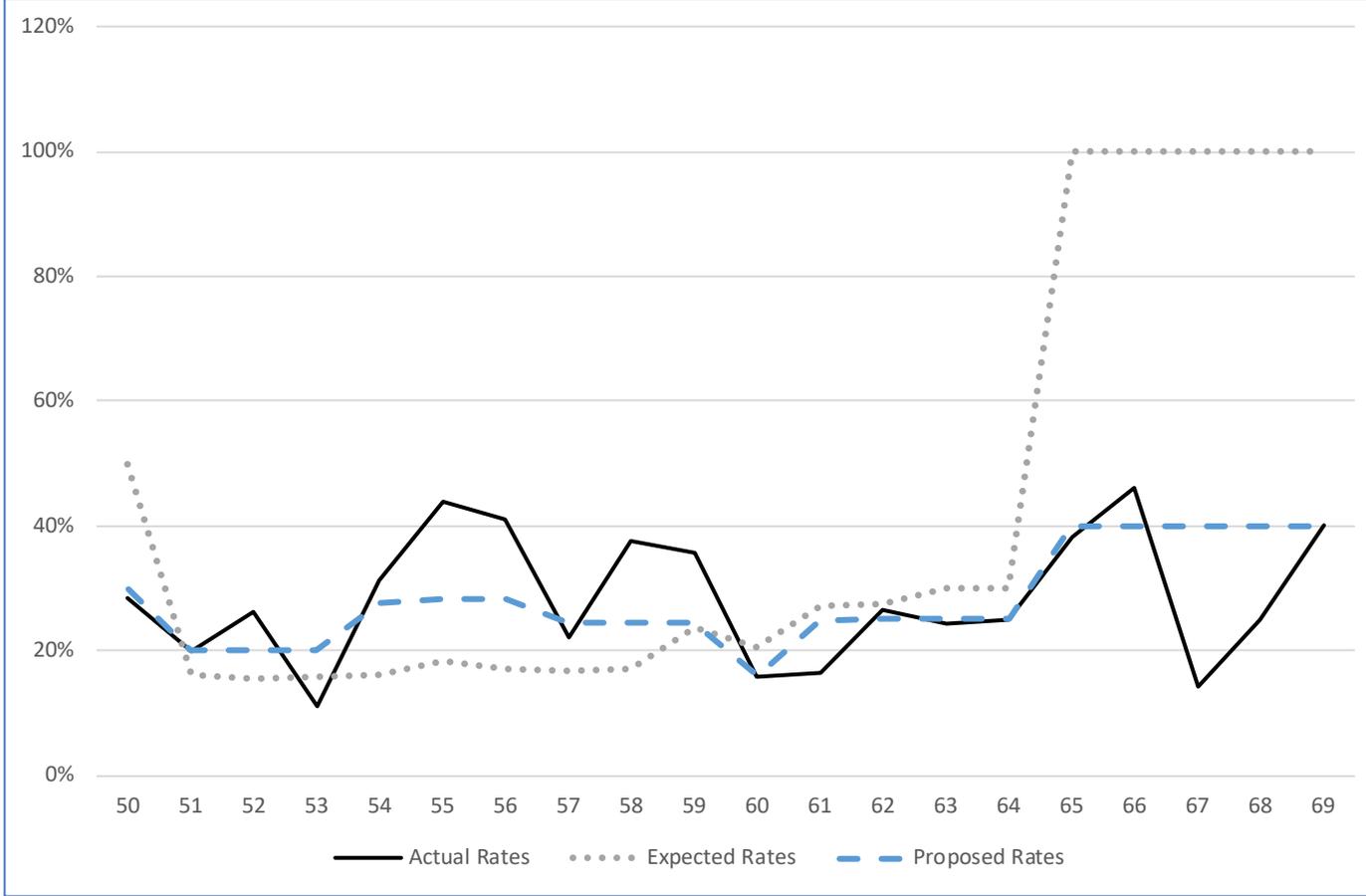
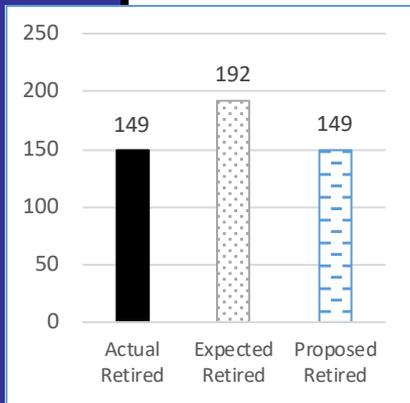




Retirement Rates - Eligible for Unreduced Non Top 10 Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review and were extended to age 70.

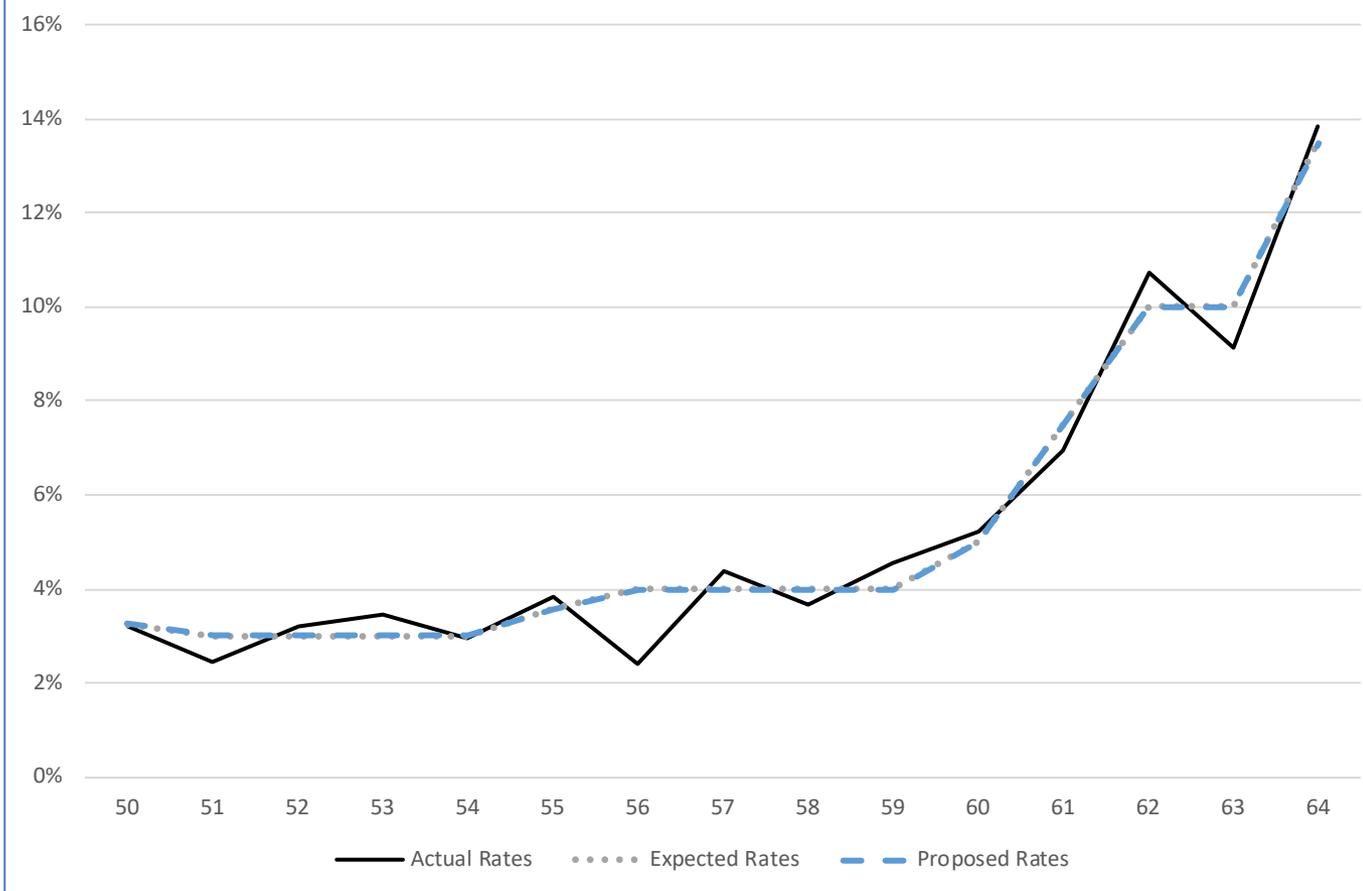
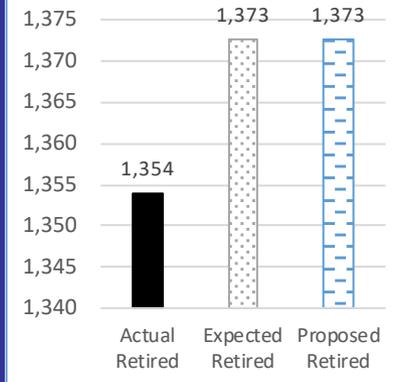




Retirement Rates - Eligible for Reduced State Males



Comment: Current rates are still a good match to experience. We recommend no change.

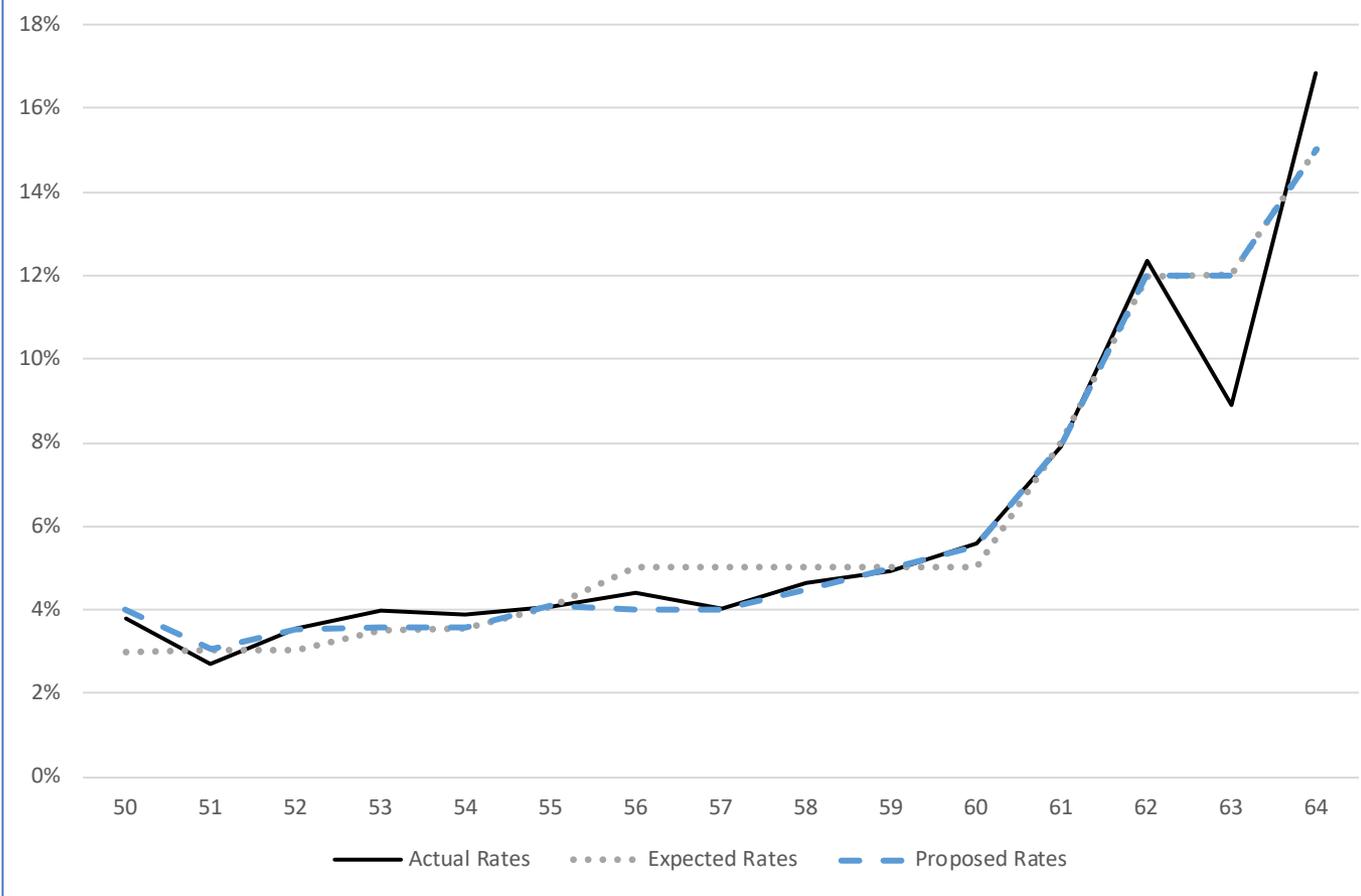
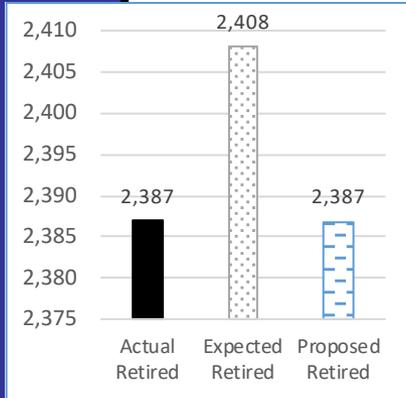




Retirement Rates - Eligible for Reduced State Females



Comment: Rates adjusted to be closer to experience since the last experience review.

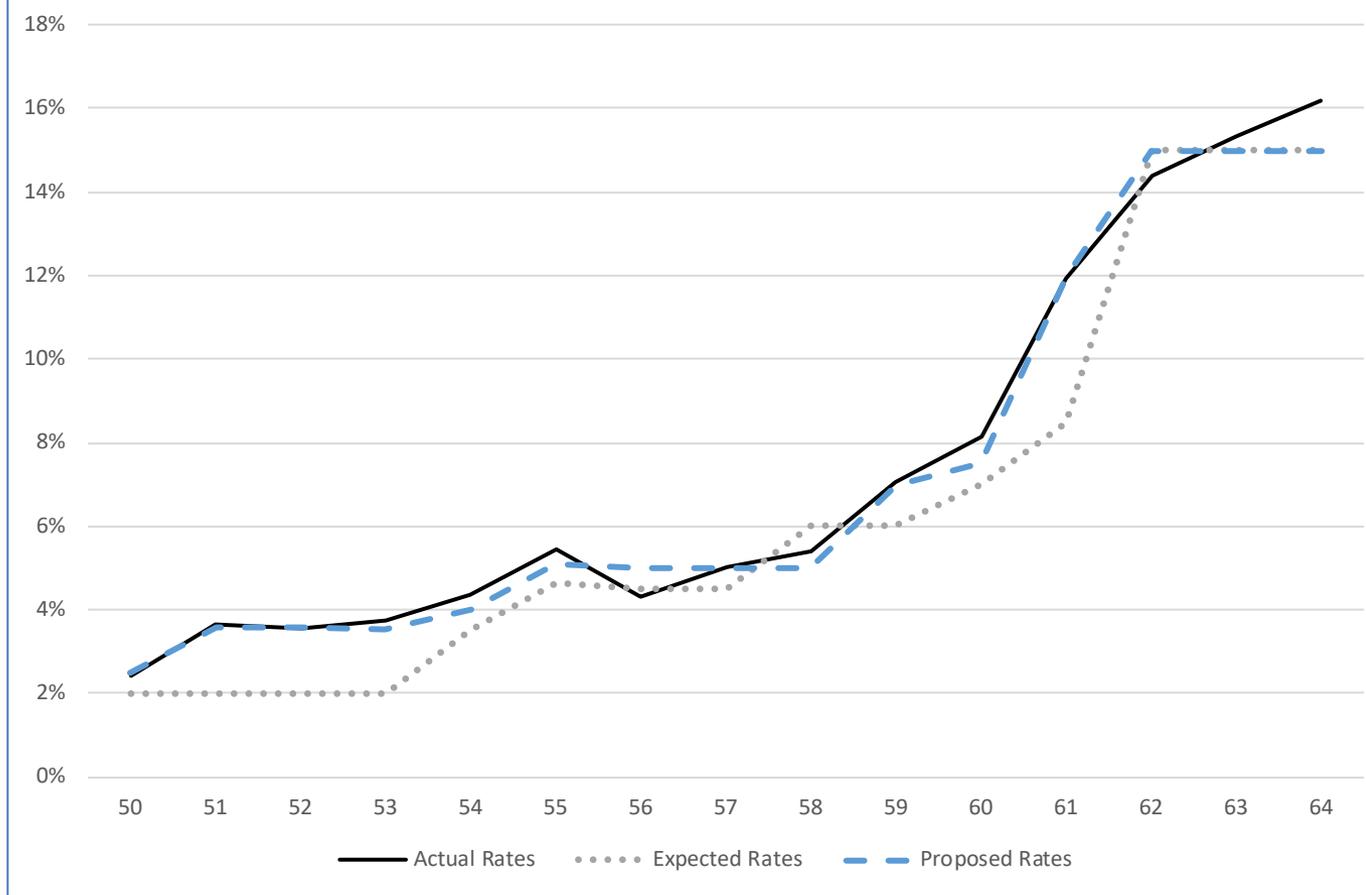
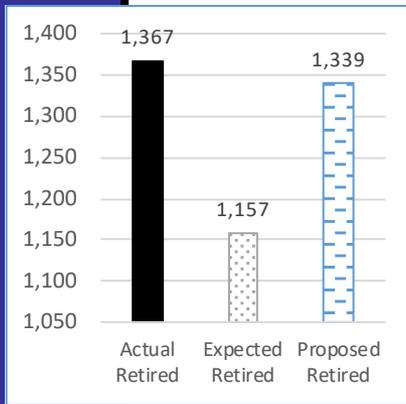




Retirement Rates - Eligible for Reduced Teachers Males



Comment: Rates adjusted to be closer to experience since the last experience review.

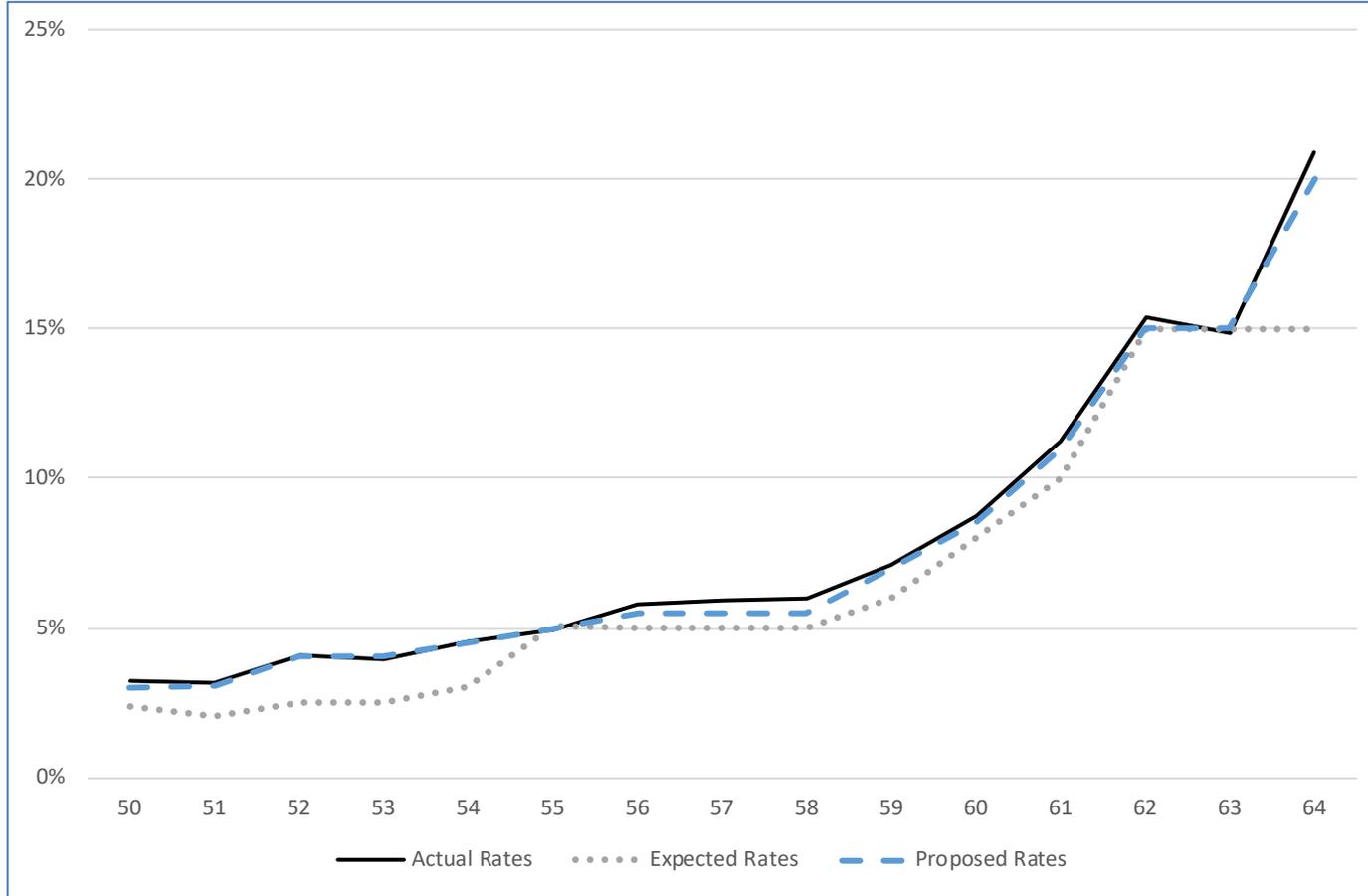
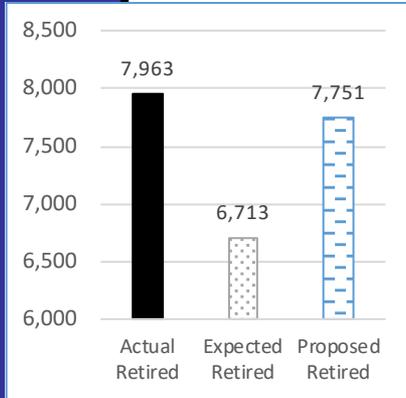




Retirement Rates - Eligible for Reduced Teachers Females



Comment: Rates adjusted to be closer to experience since the last experience review.

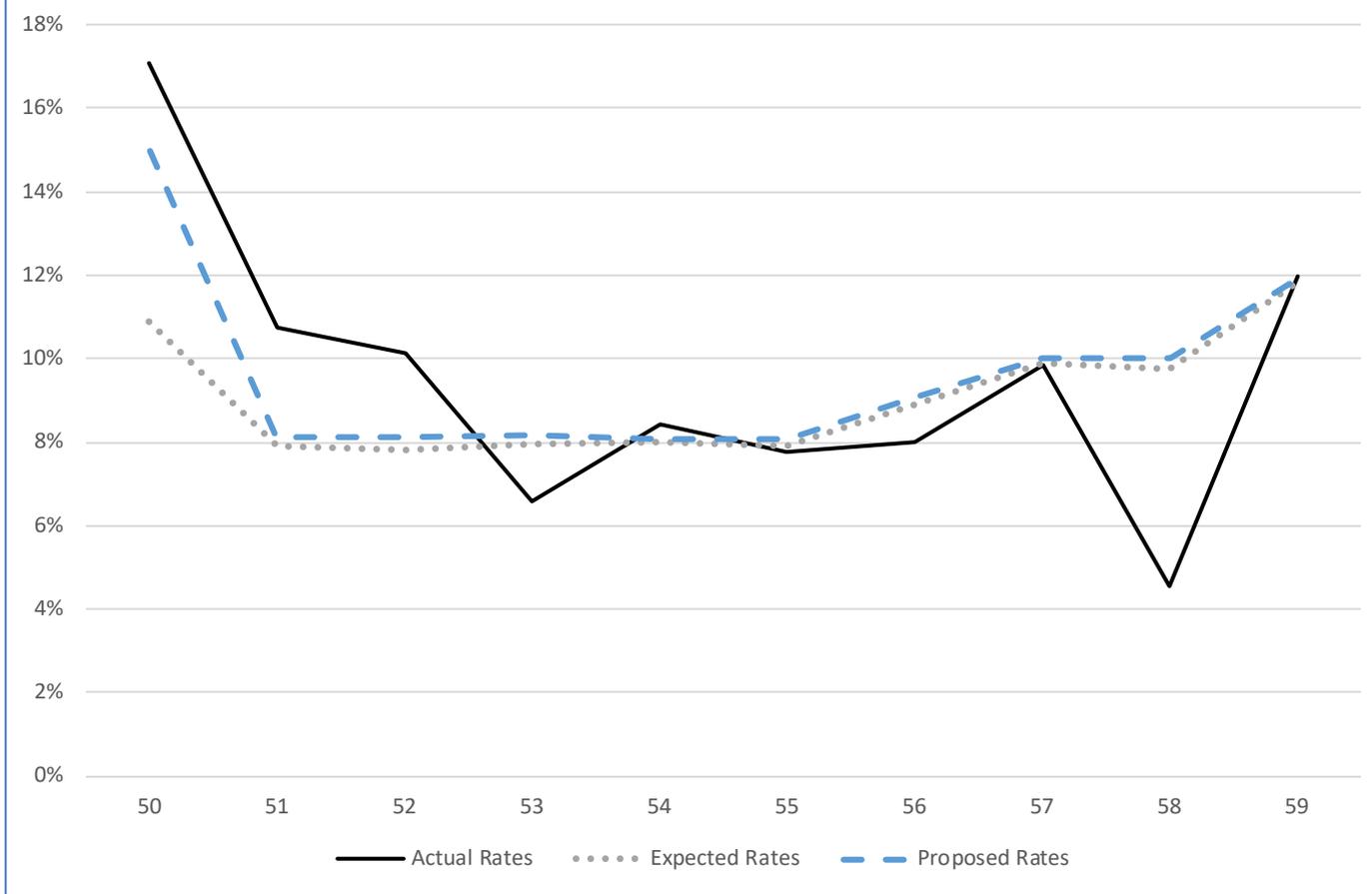
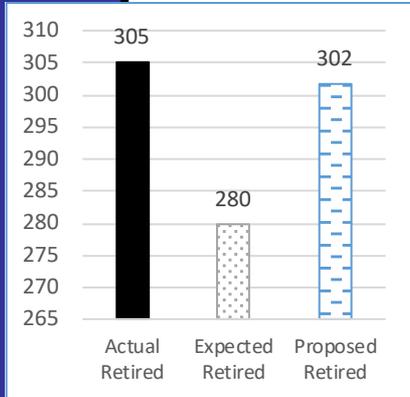




Retirement Rates - Eligible for Reduced VaLORS Males



Comment: Rates adjusted to be closer to experience since the last experience review.

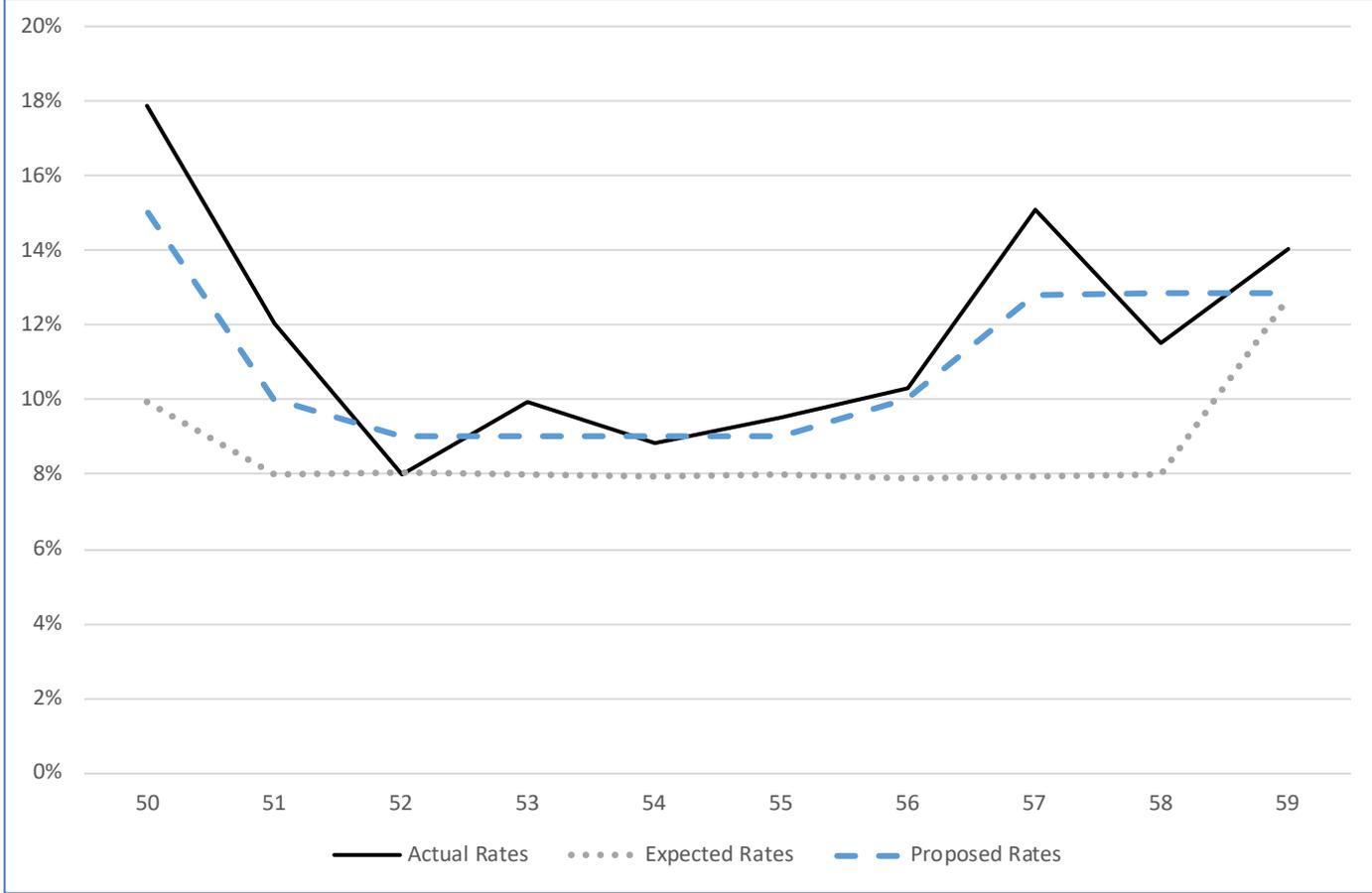
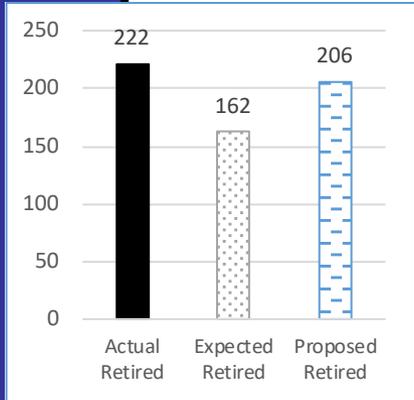




Retirement Rates - Eligible for Reduced VaLORS Females



Comment: Rates adjusted to be closer to experience since the last experience review.



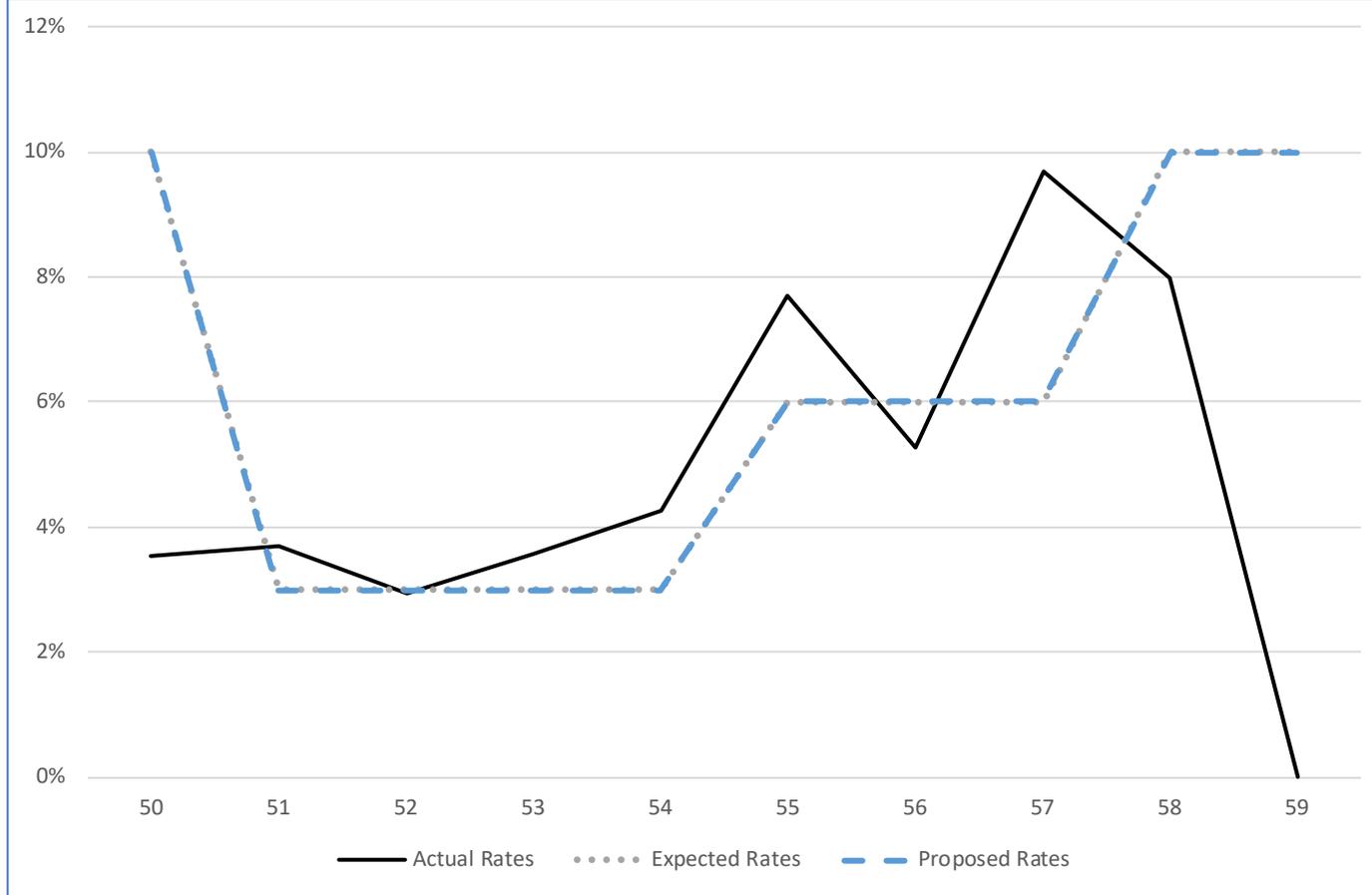
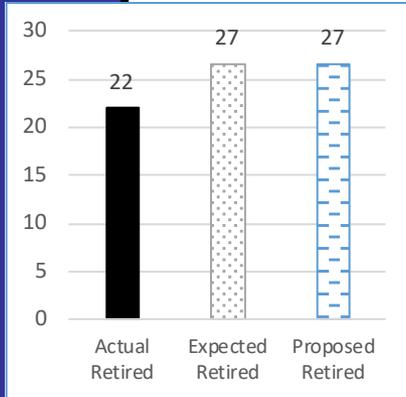


Retirement Rates - Eligible for Reduced SPORS

Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.

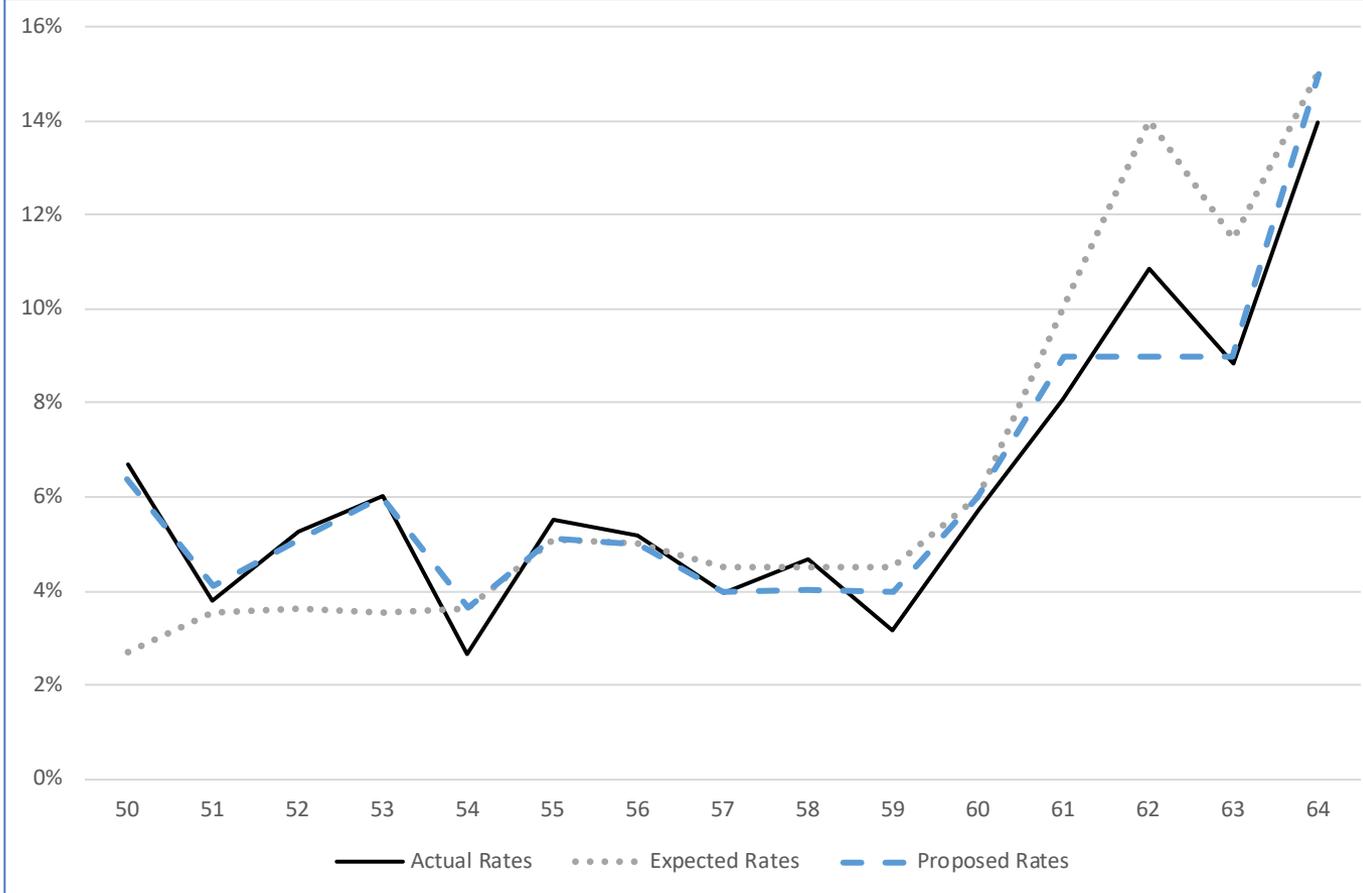
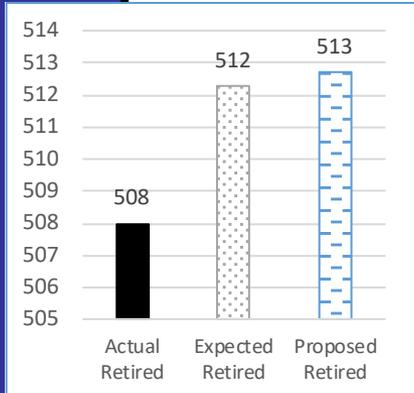




Retirement Rates - Eligible for Reduced Top 10 Non Hazardous Duty Males



Comment: Current rates are still a good match to experience. We recommend very slight changes.

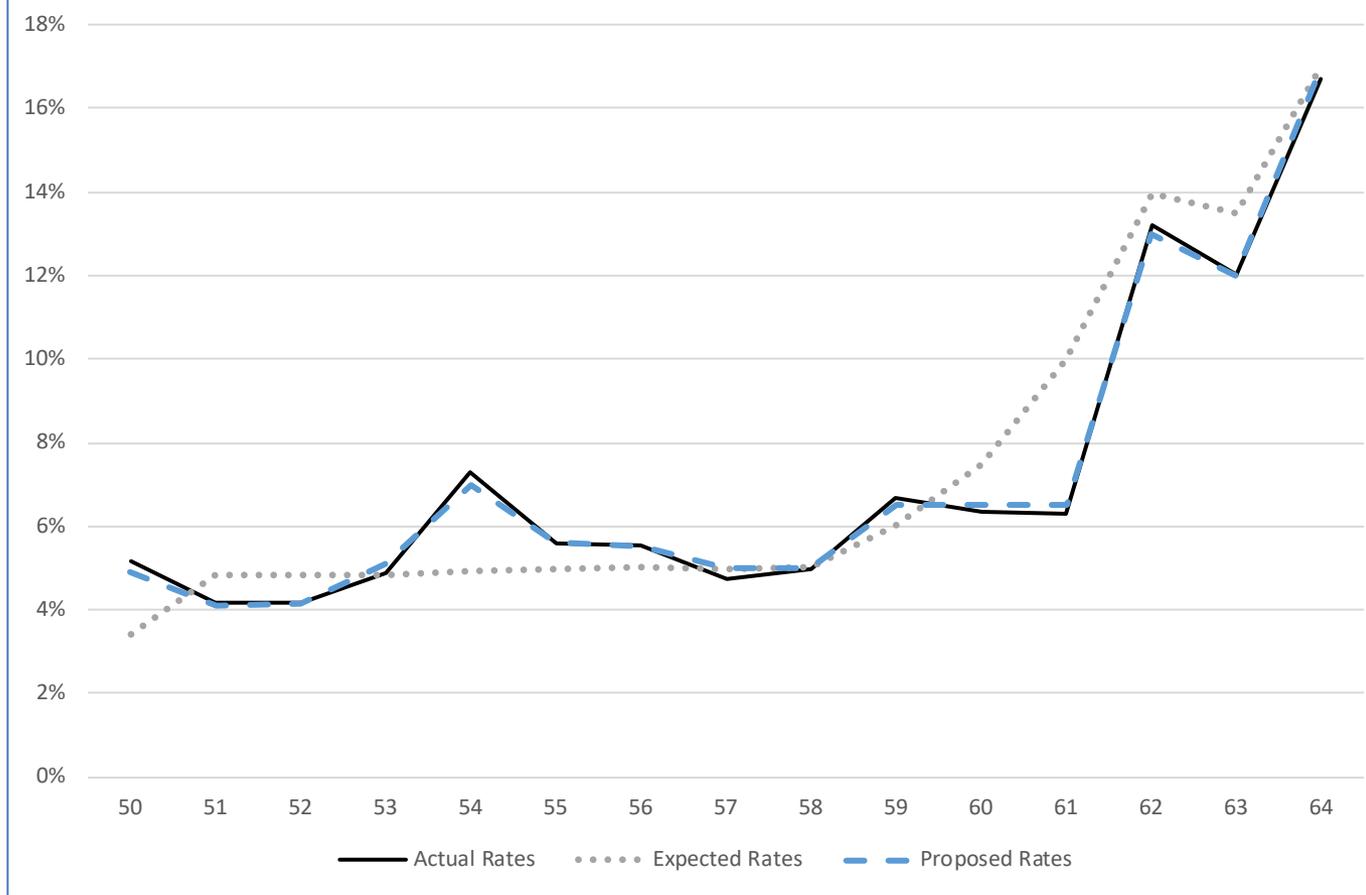
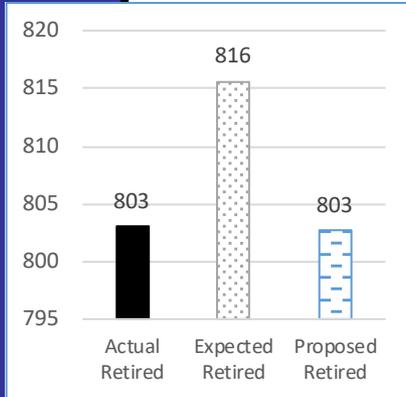




Retirement Rates - Eligible for Reduced Top 10 Non Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review.

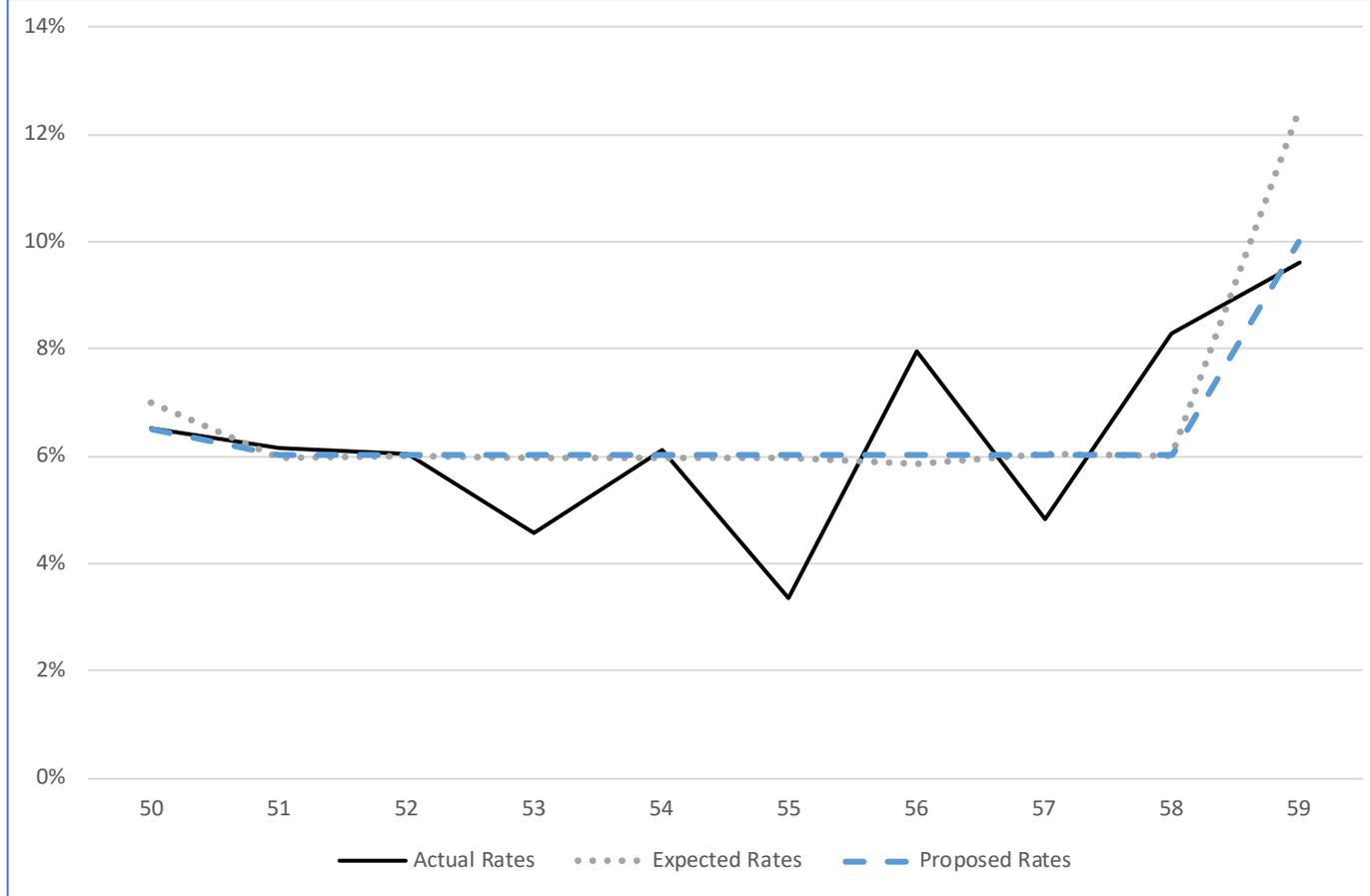
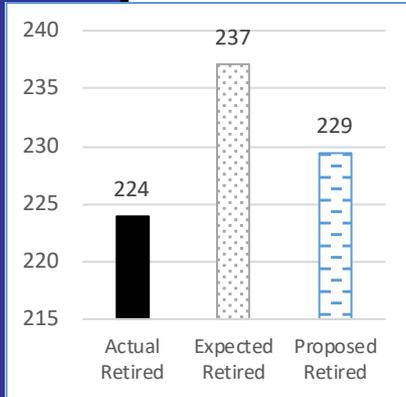




Retirement Rates - Eligible for Reduced Top 10 Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.

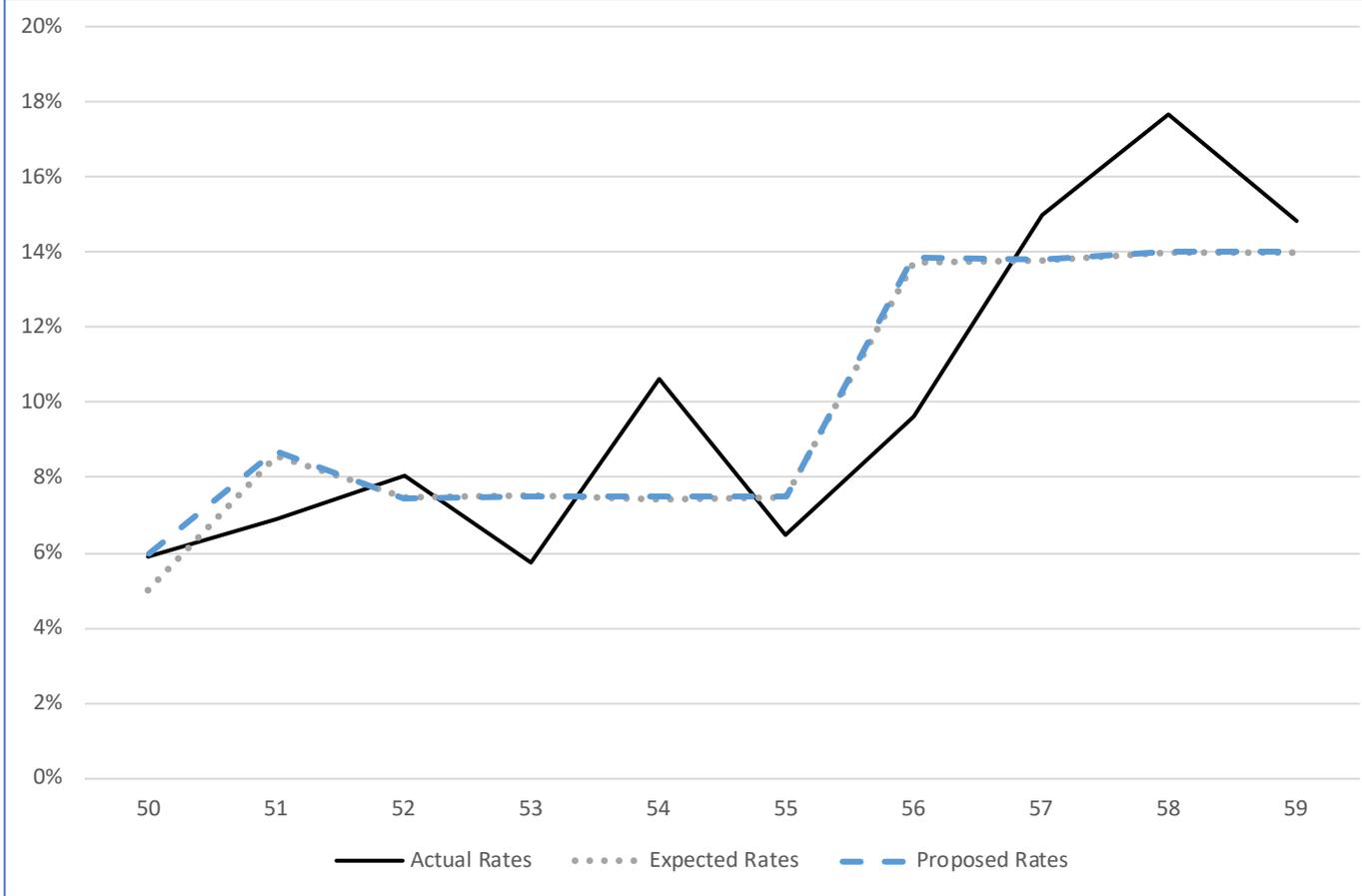
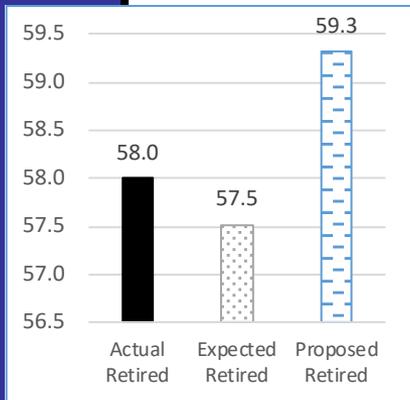




Retirement Rates - Eligible for Reduced Top 10 Hazardous Duty Females



Comment: Current rates are still a good match to experience. We recommend very slight changes.

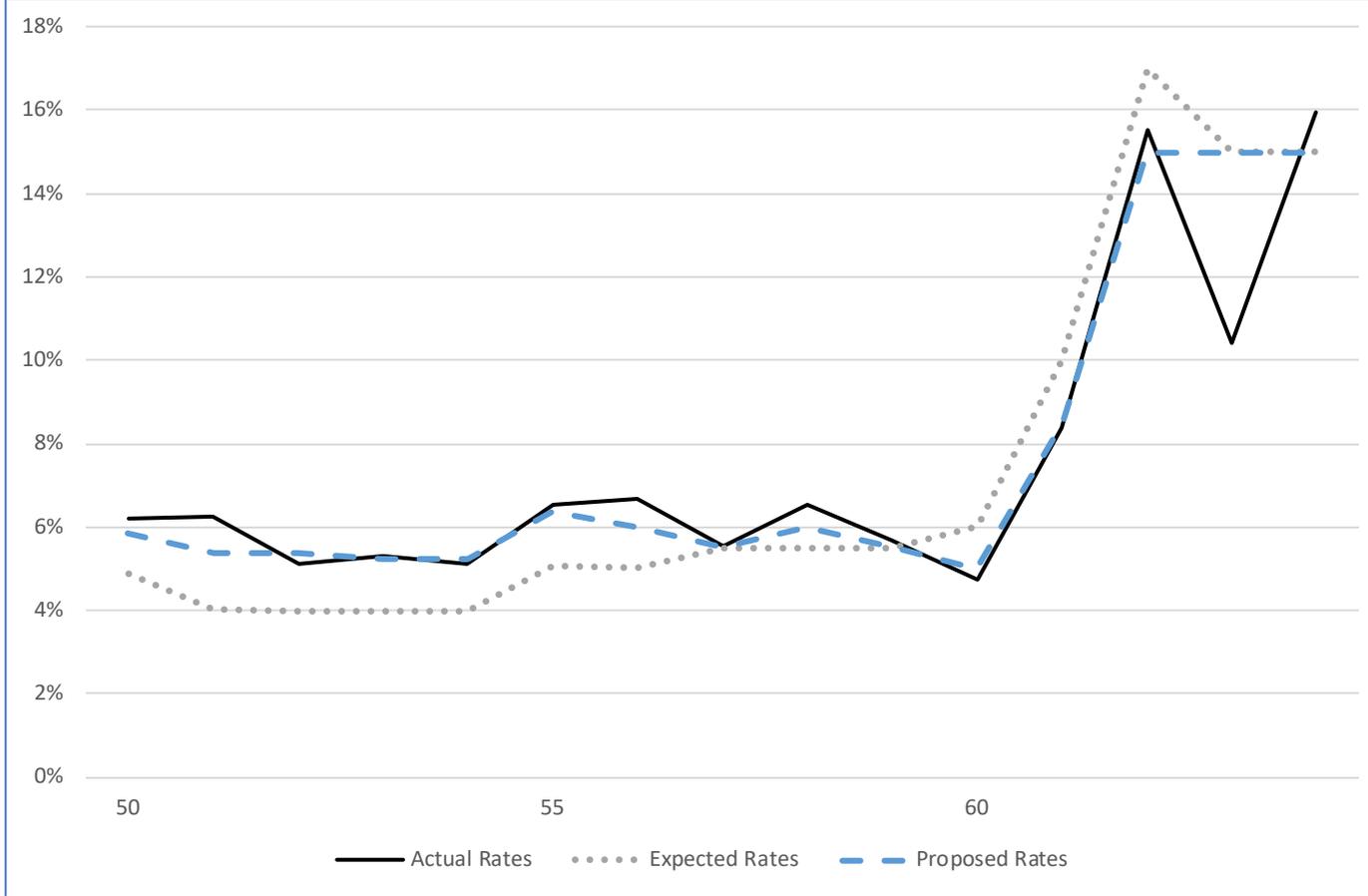
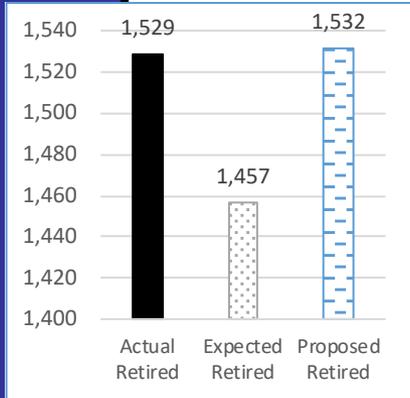




Retirement Rates - Eligible for Reduced Non Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.

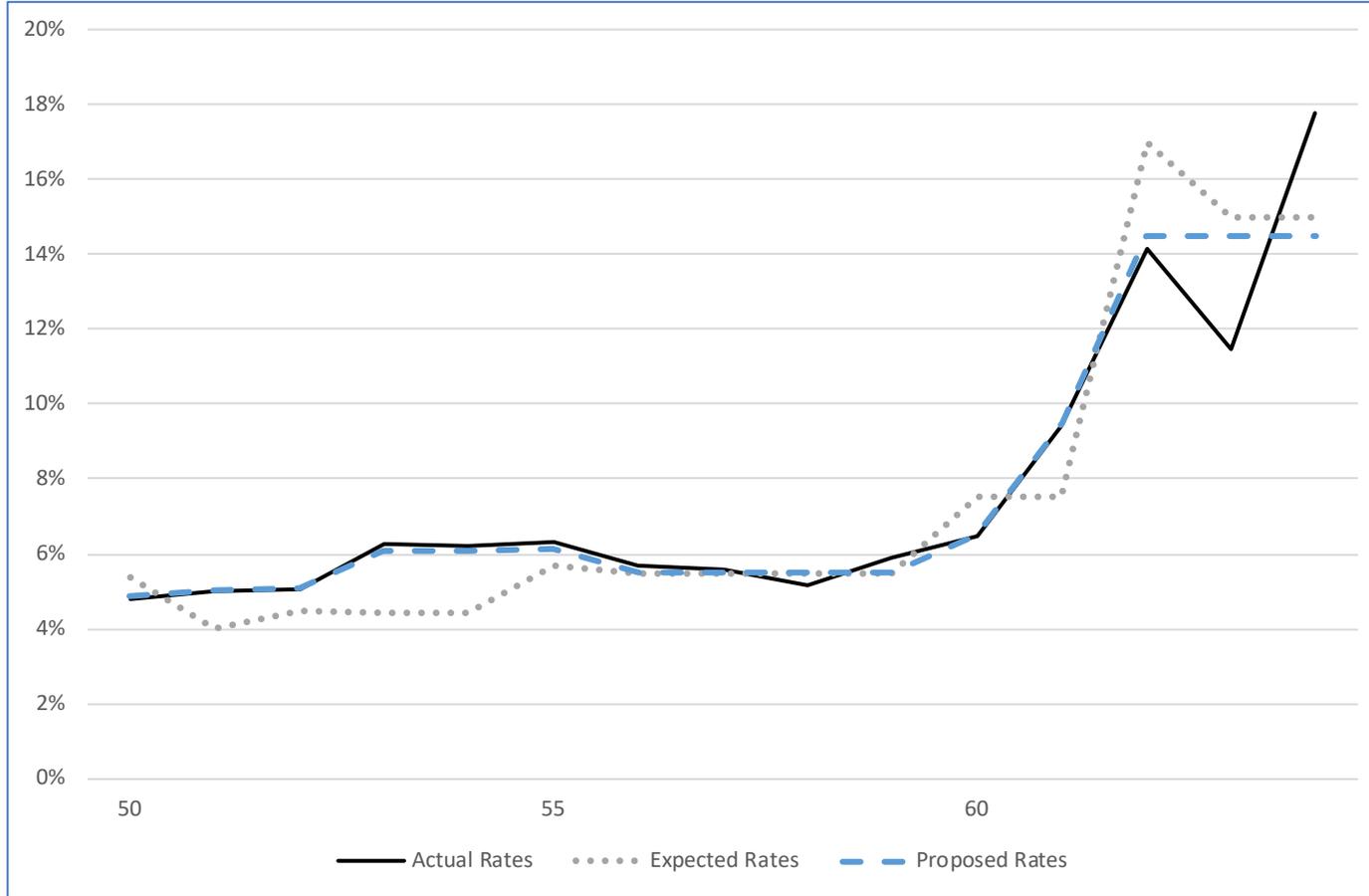
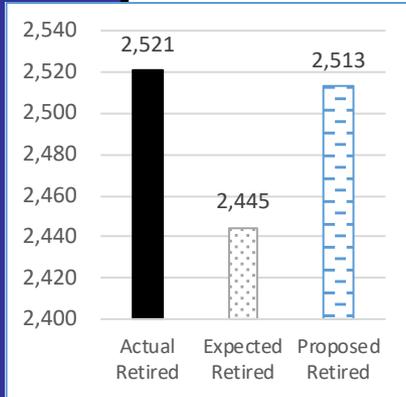




Retirement Rates - Eligible for Reduced Non Top 10 Non Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review.

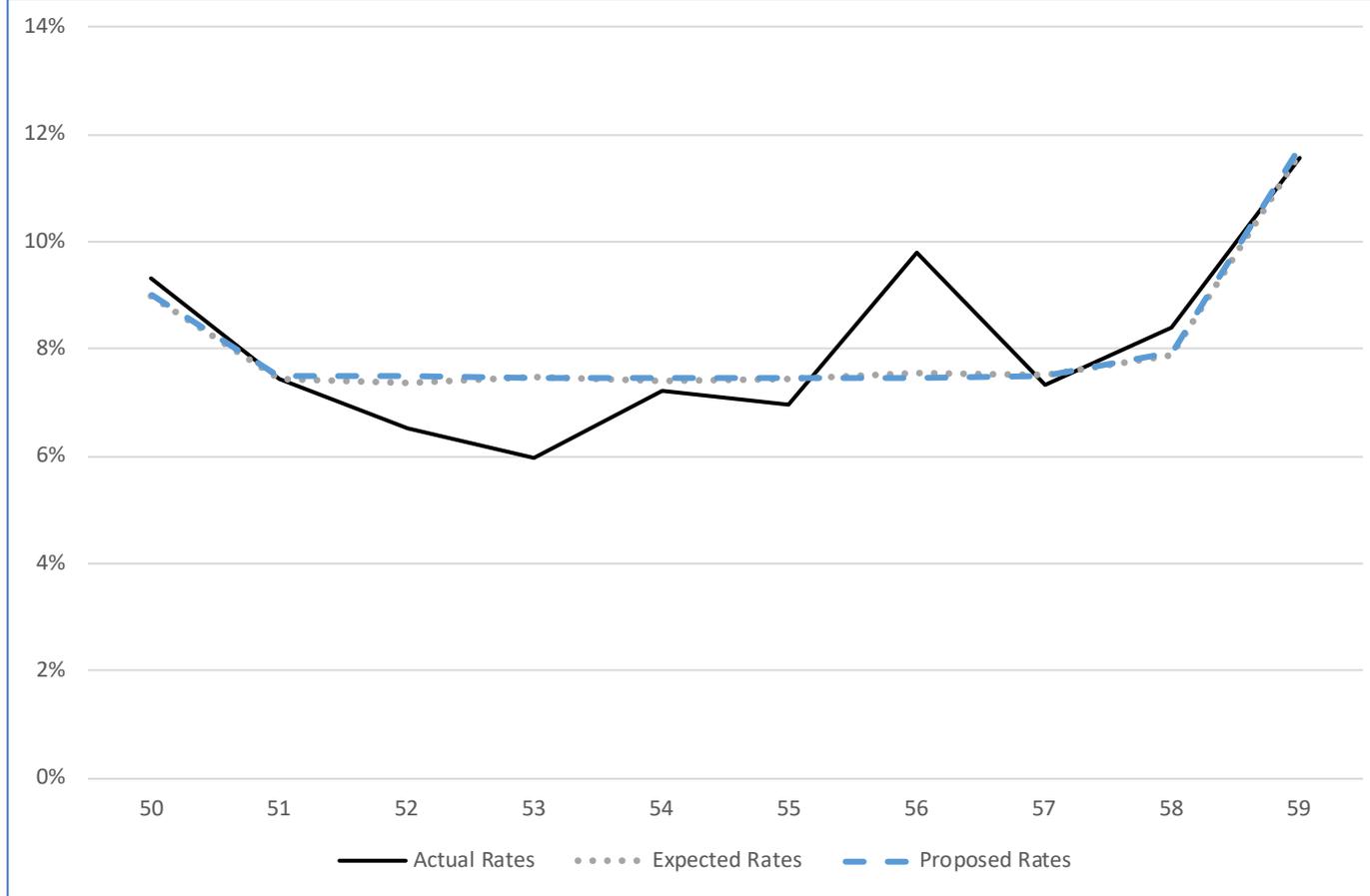
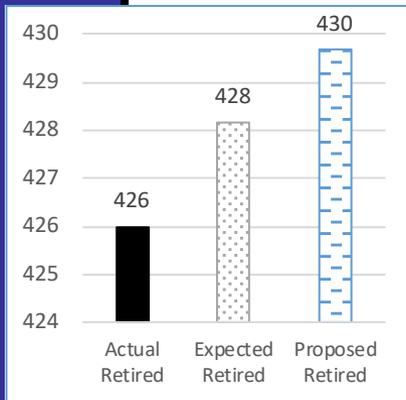




Retirement Rates - Eligible for Reduced Non Top 10 Hazardous Duty Males



Comment: Current rates are still a good match to experience. We recommend very slight changes.

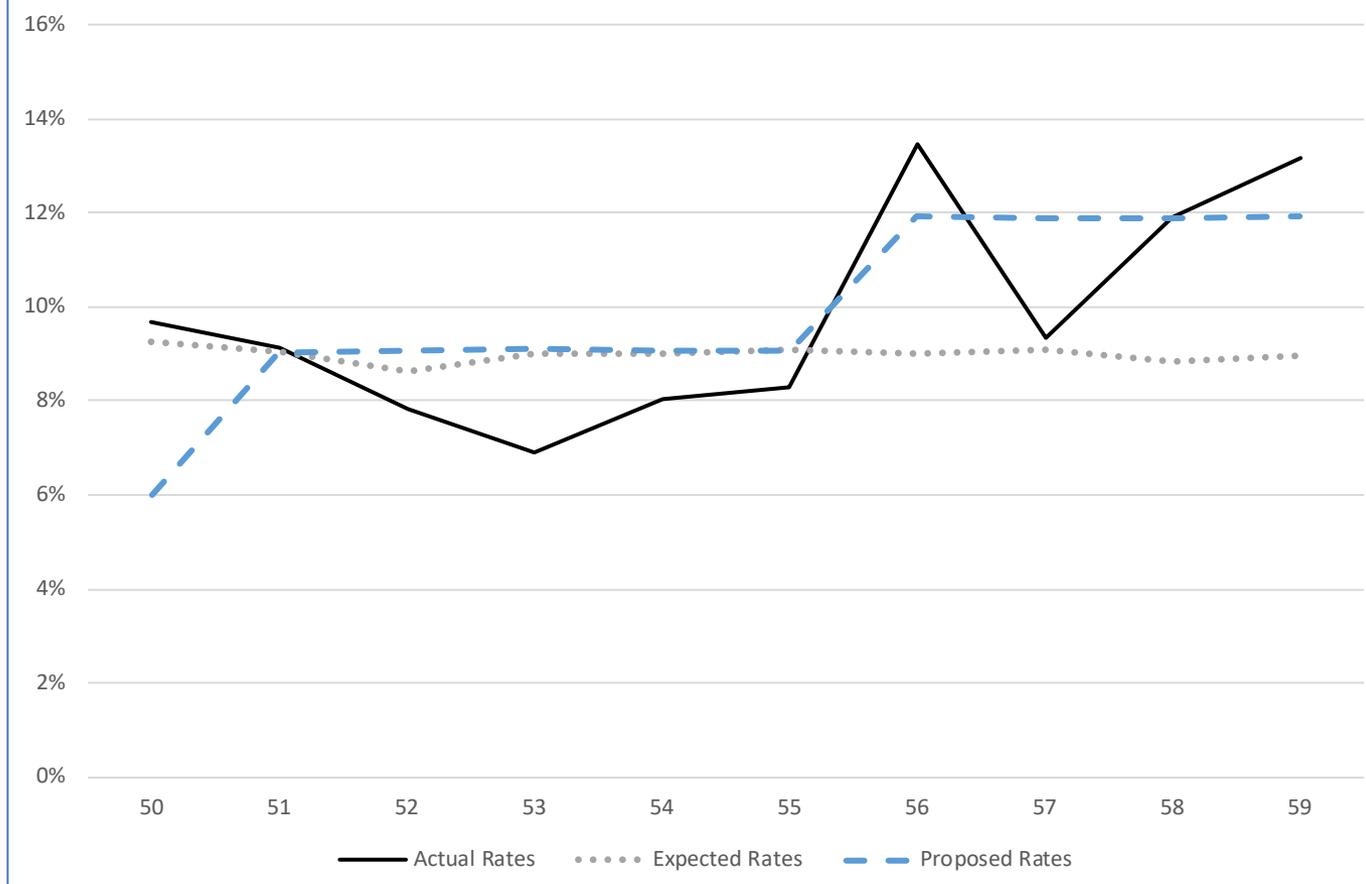
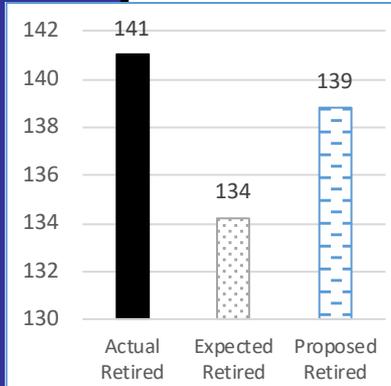




Retirement Rates - Eligible for Reduced Non Top 10 Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review.



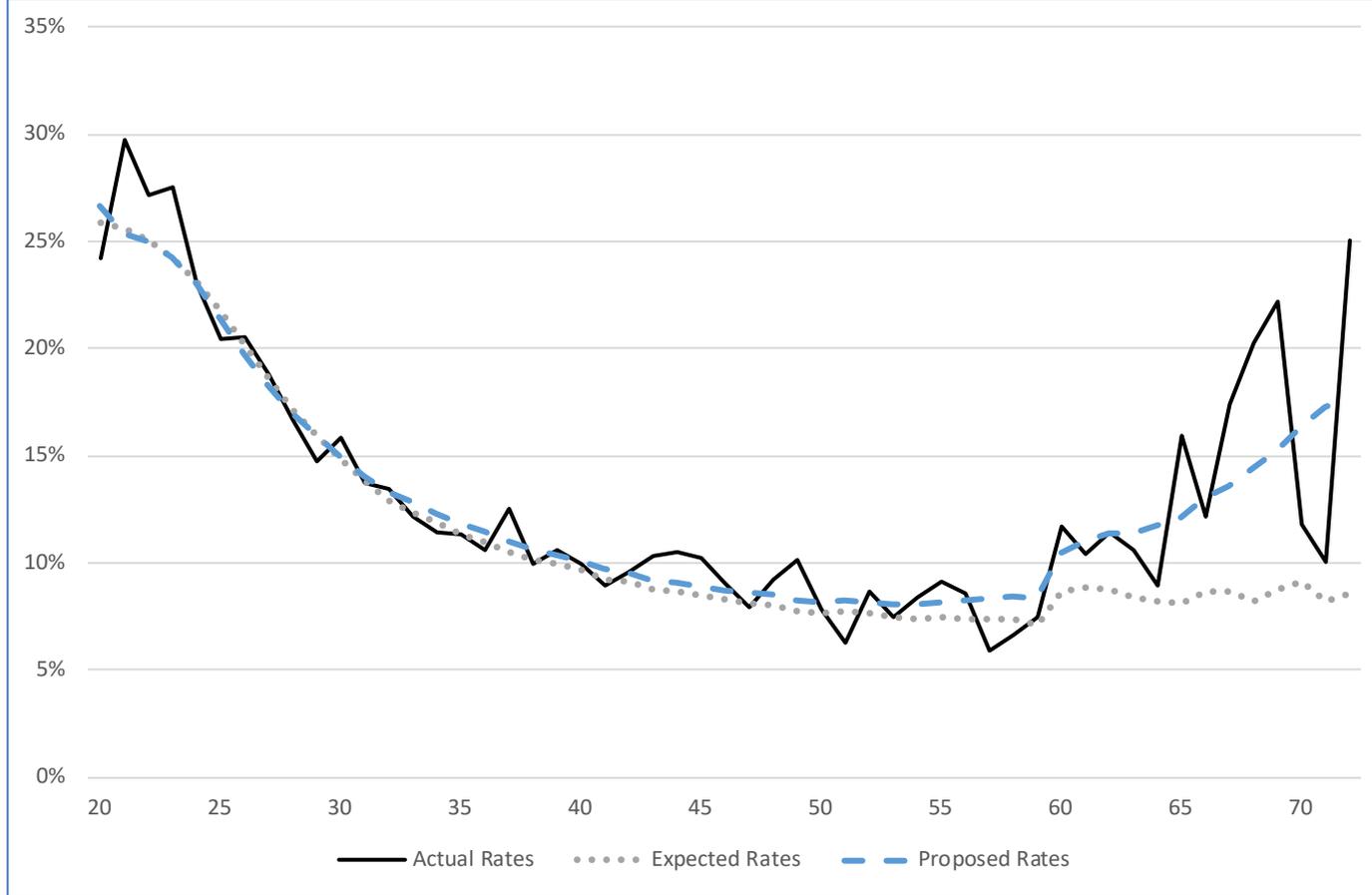
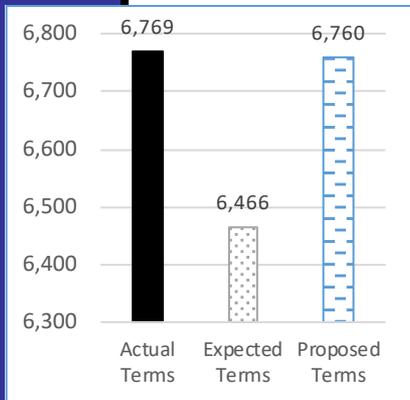


Termination Rates - <10 Years of Service

State Males



Comment: Rates adjusted to be closer to experience since the last experience review.



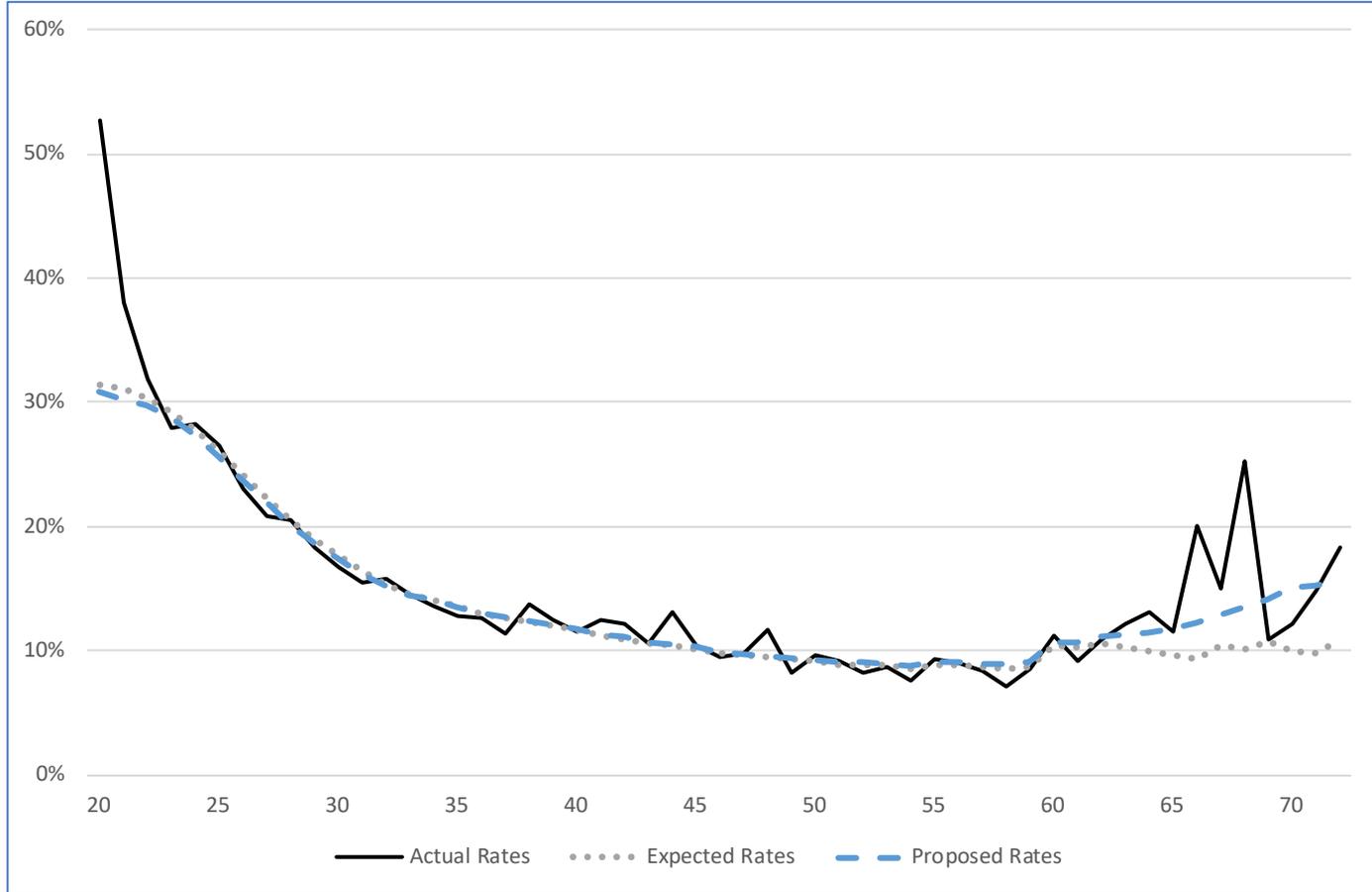
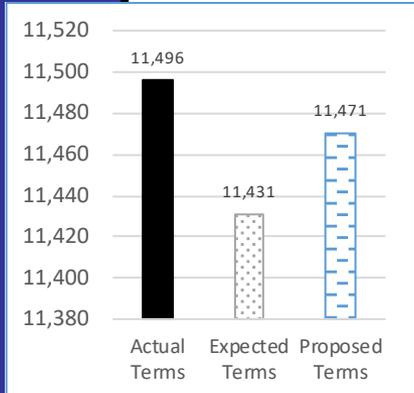


Termination Rates - <10 Years of Service

State Females



Comment: Rates adjusted to be closer to experience since the last experience review.





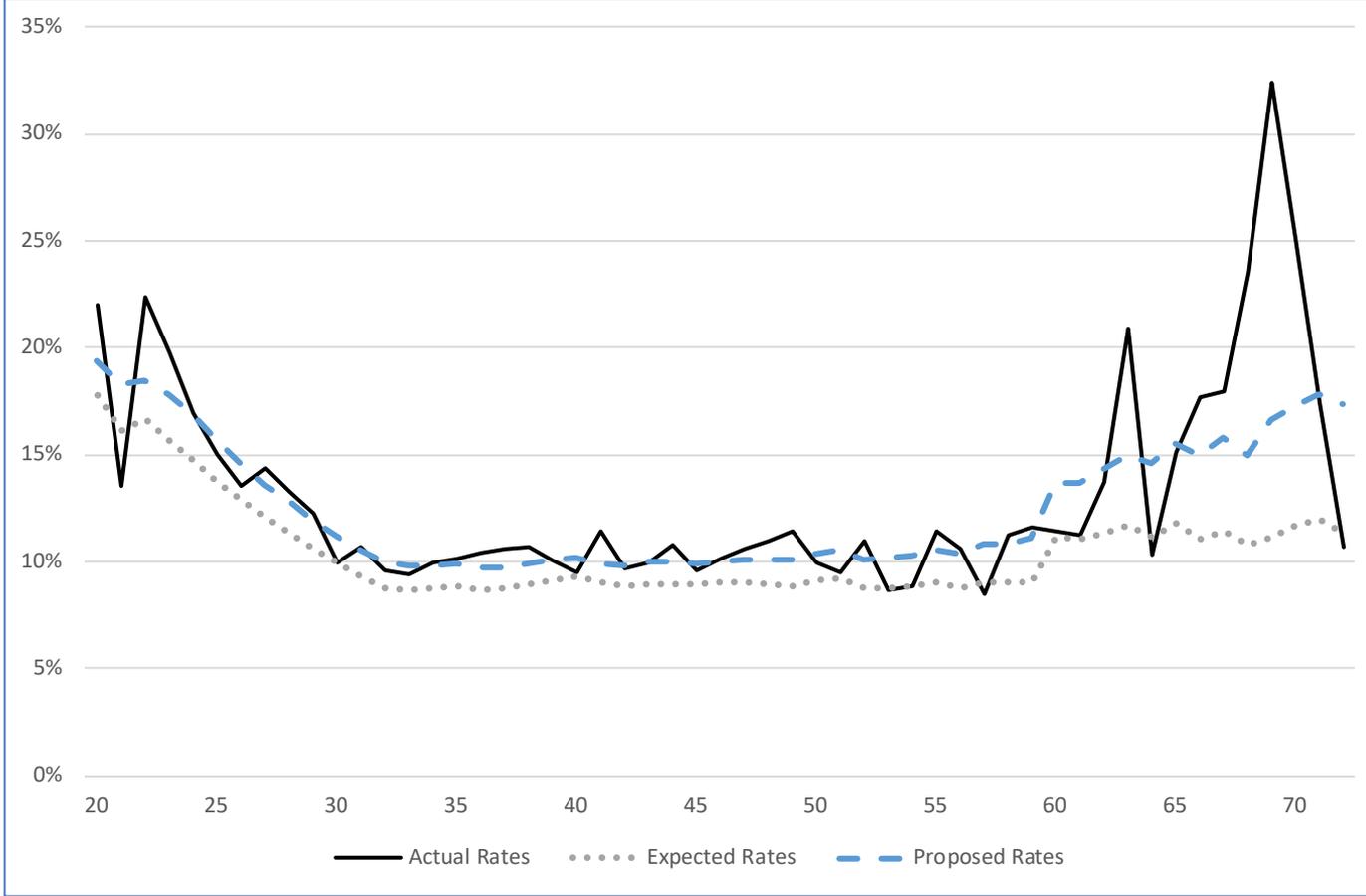
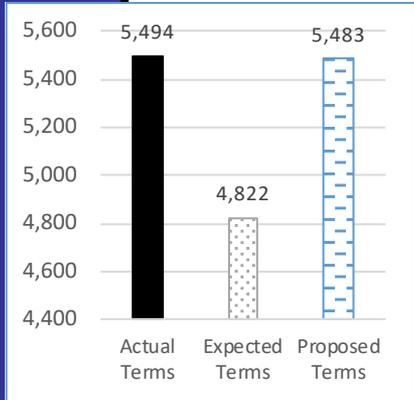
Termination Rates - <10 Years of Service

Teachers

Males



Comment: Rates adjusted to be closer to experience since the last experience review.





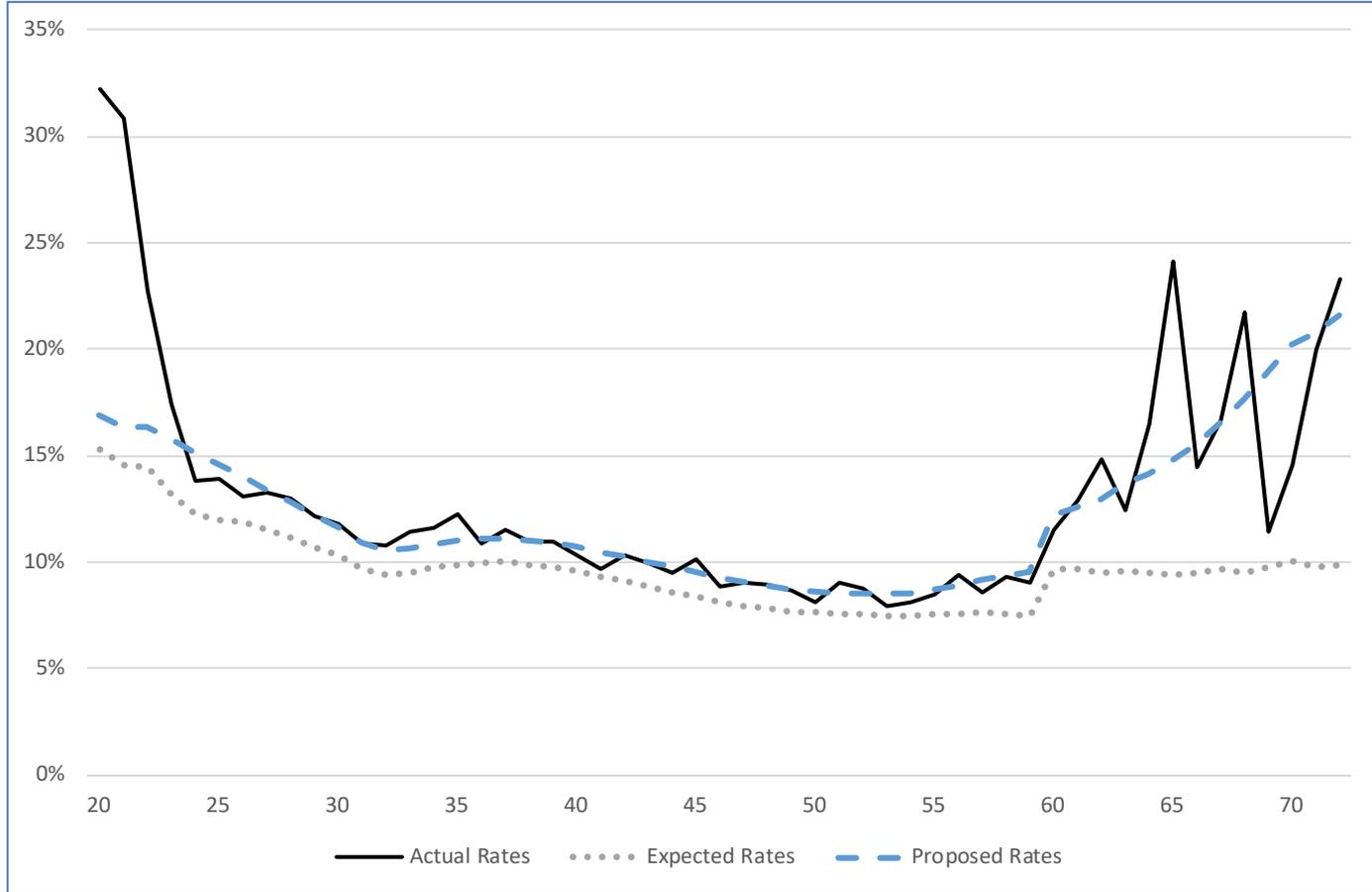
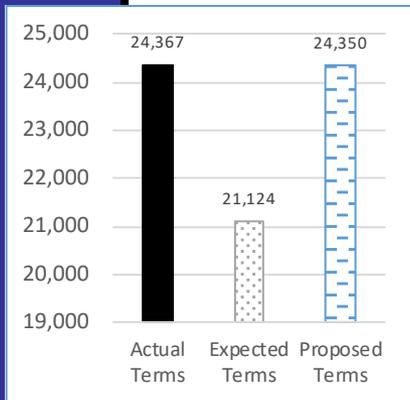
Termination Rates - <10 Years of Service

Teachers

Females



Comment: Rates adjusted to be closer to experience since the last experience review.



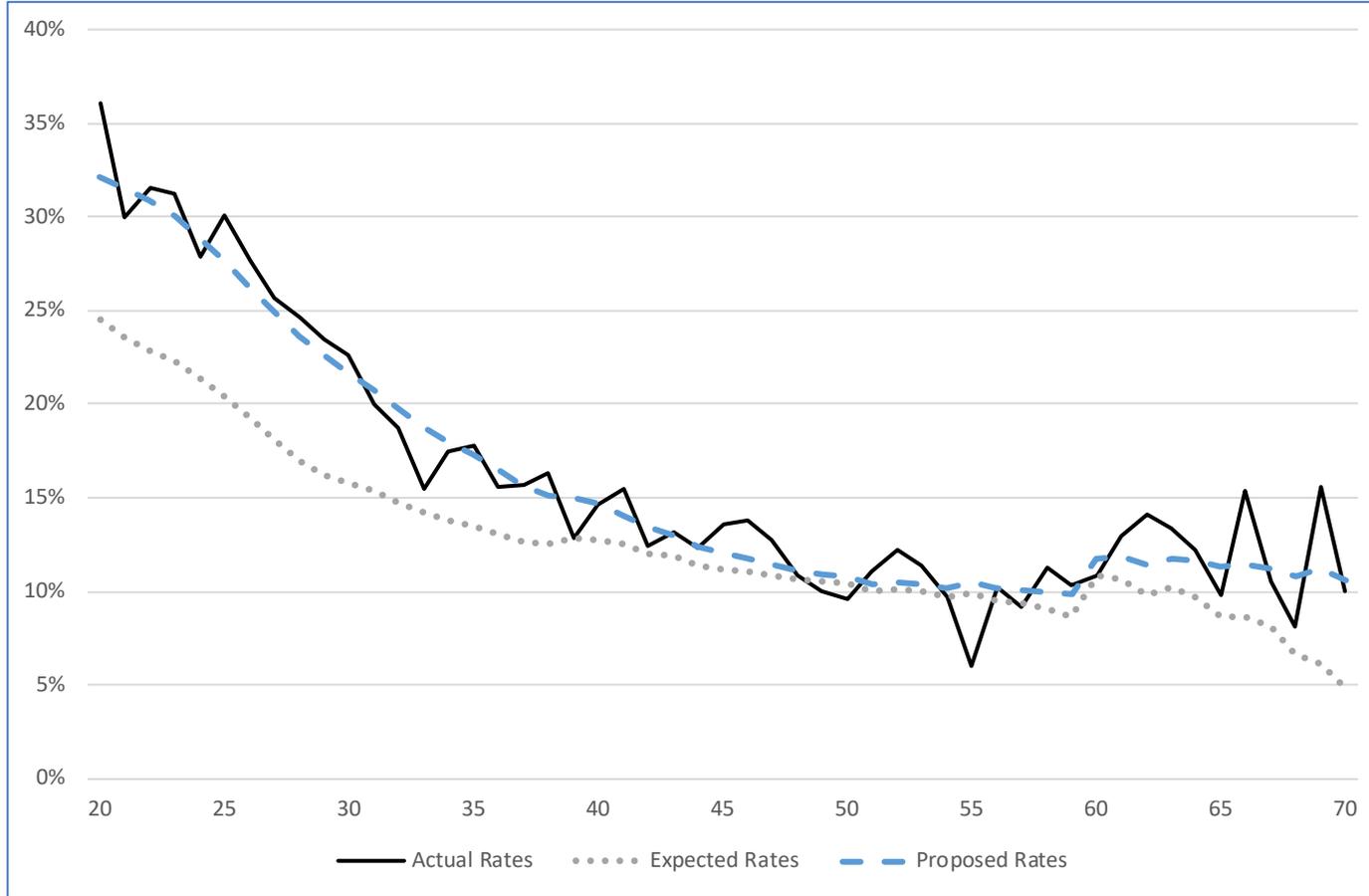
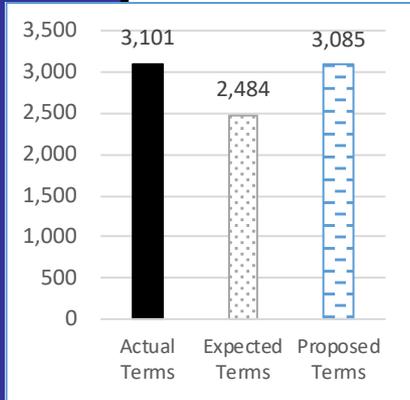


Termination Rates - <10 Years of Service

Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.





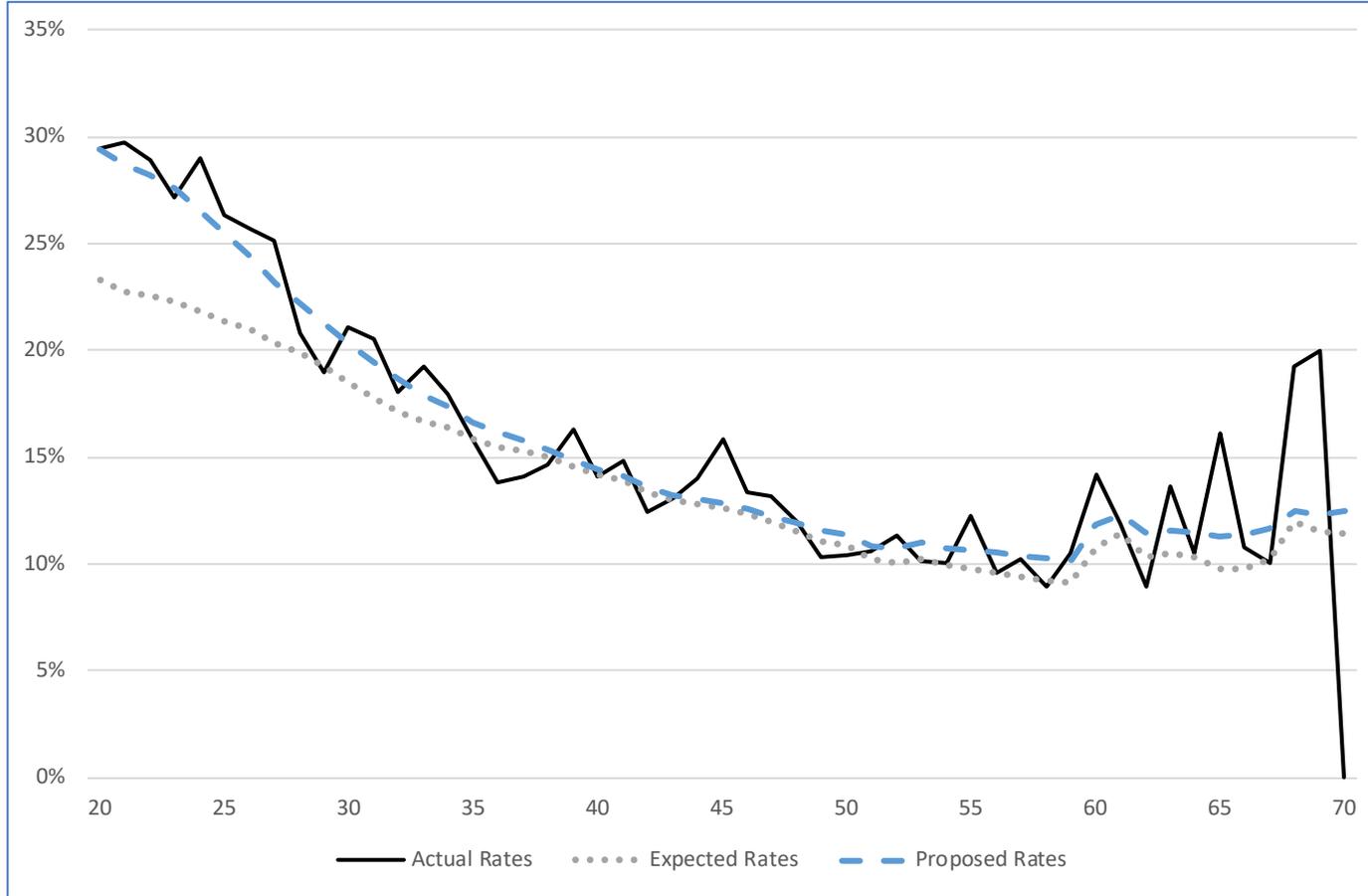
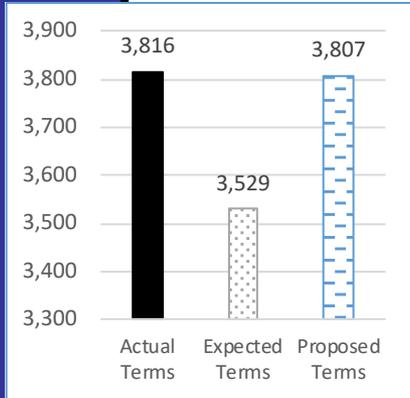
Termination Rates - <10 Years of Service

Top 10 Non Hazardous Duty

Females



Comment: Rates adjusted to be closer to experience since the last experience review.





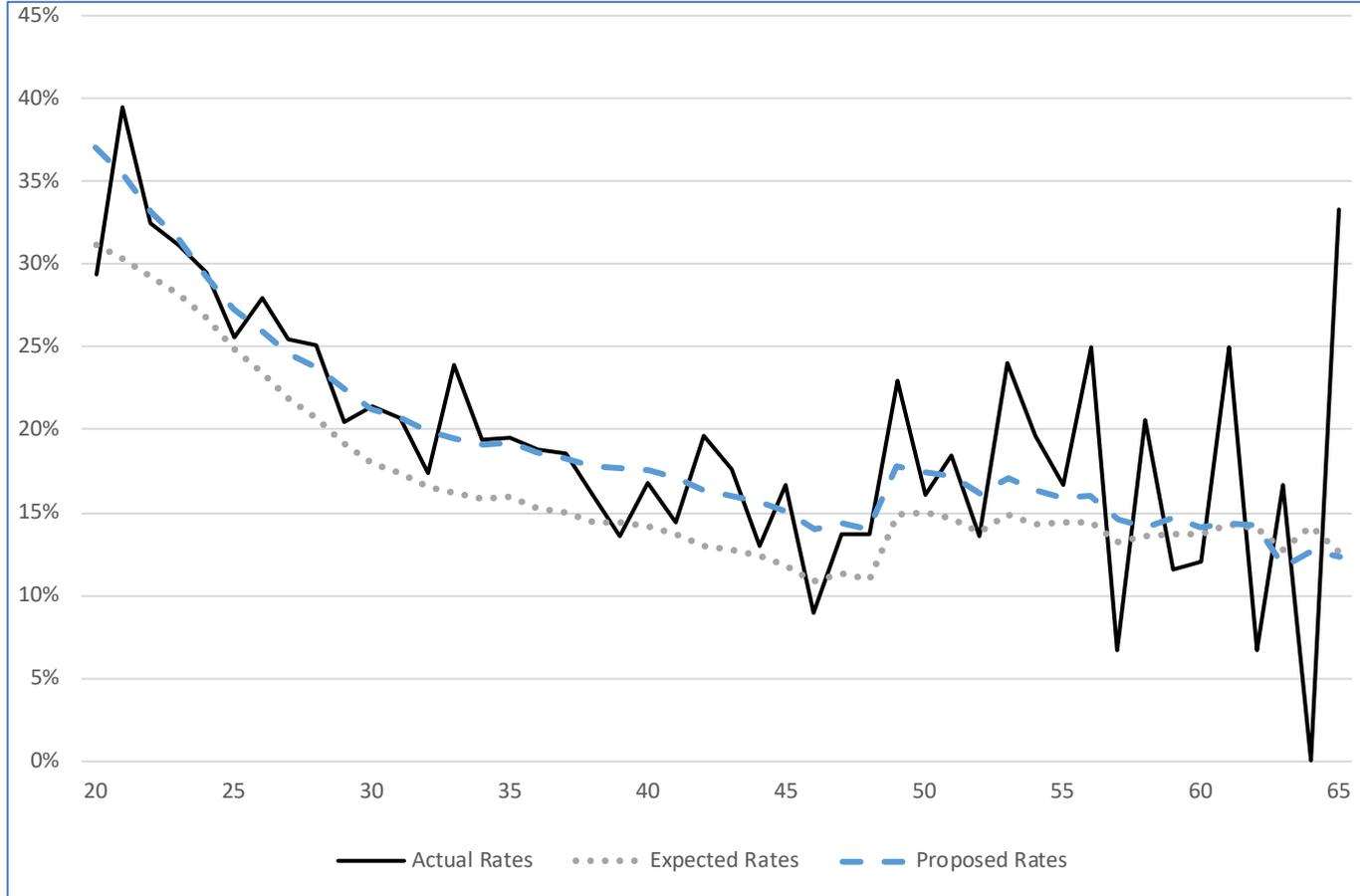
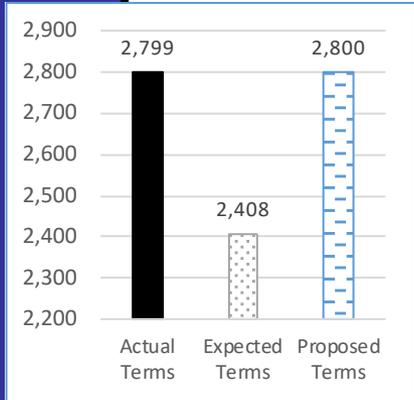
Termination Rates - <10 Years of Service

VaLORS

Males



Comment: Rates adjusted to be closer to experience since the last experience review.





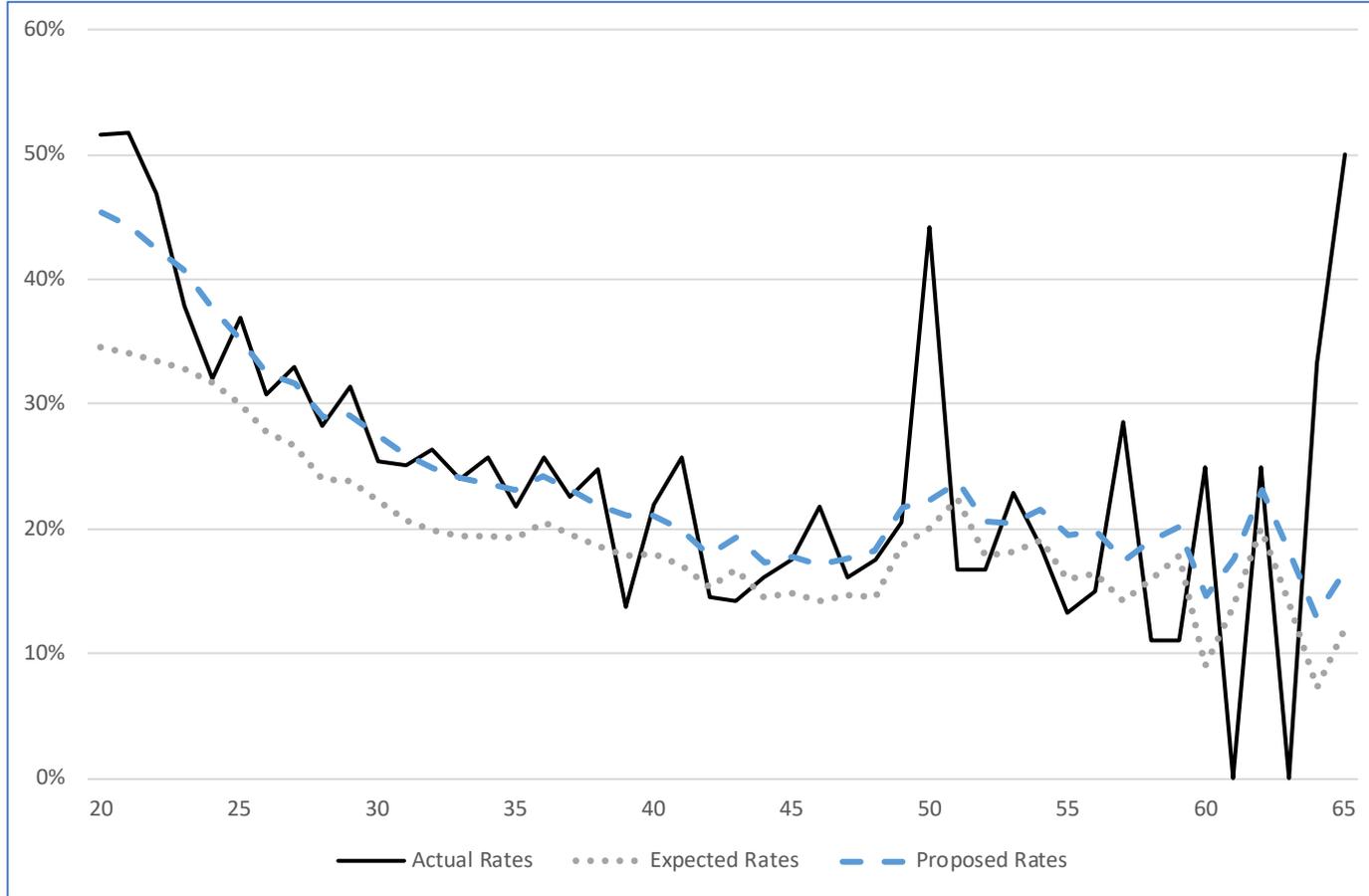
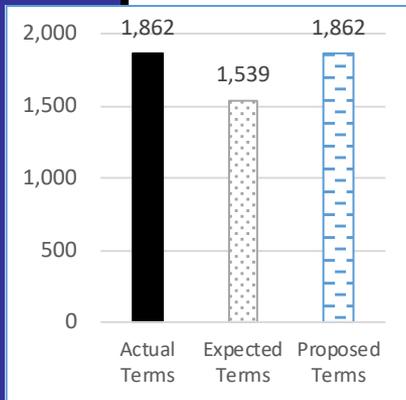
Termination Rates - <10 Years of Service

VaLORS

Females



Comment: Rates adjusted to be closer to experience since the last experience review.

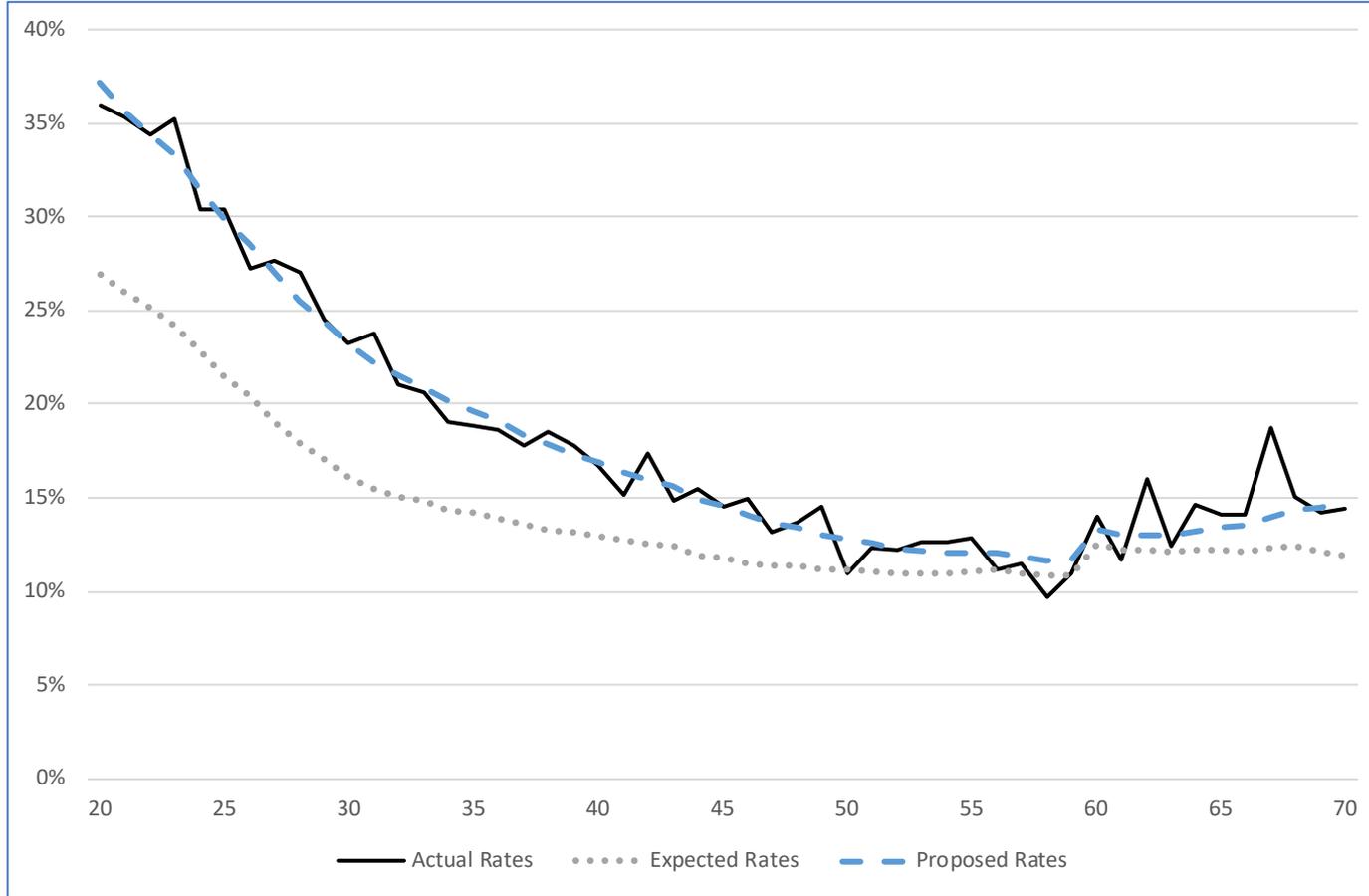
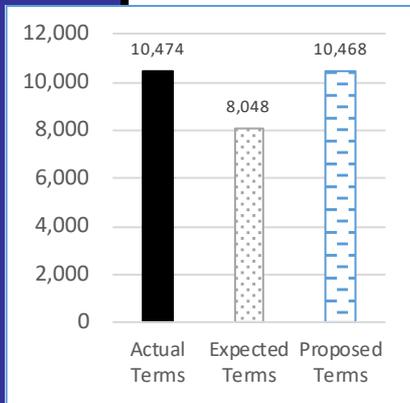




Termination Rates - <10 Years of Service Non Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.

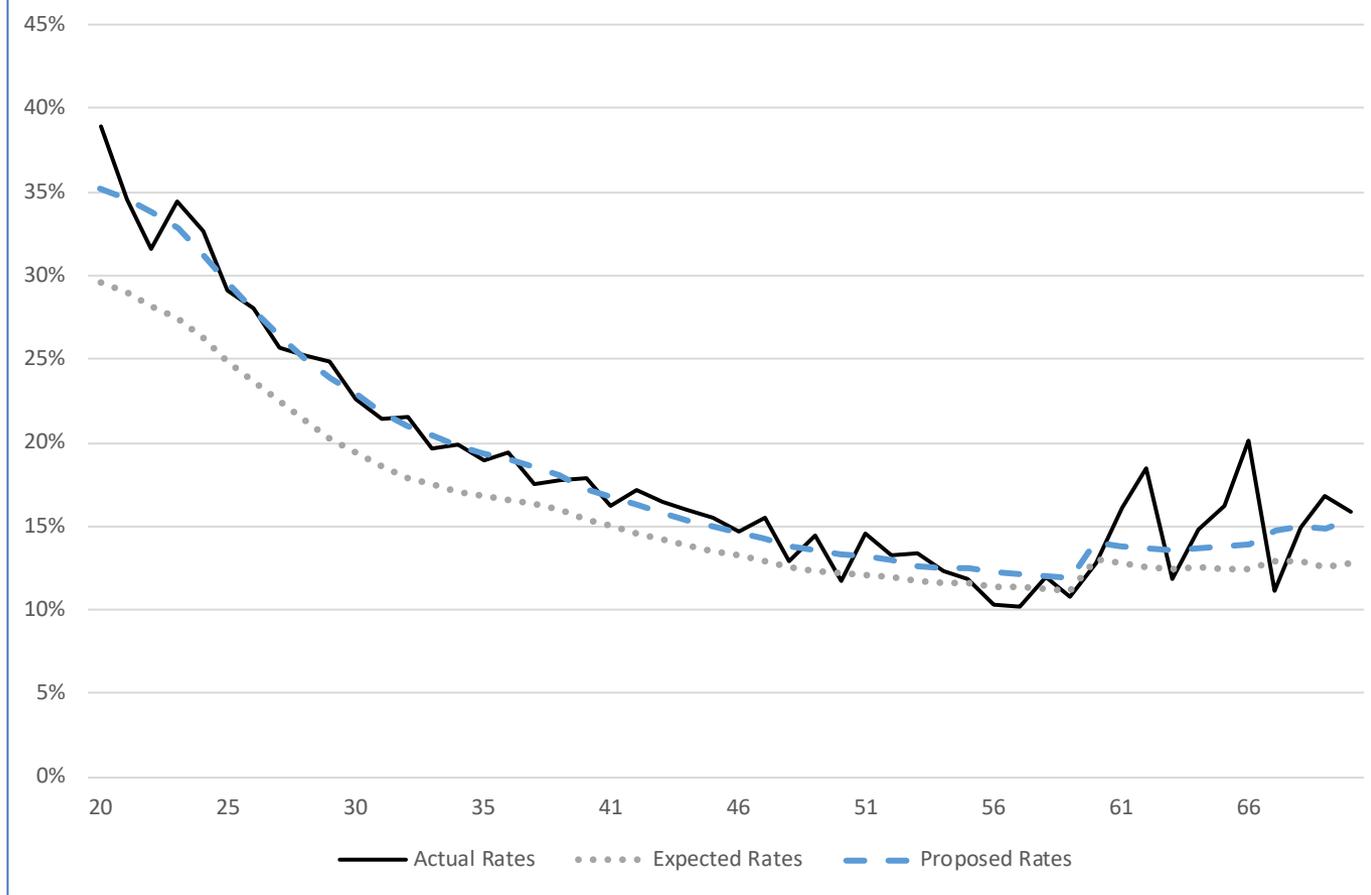
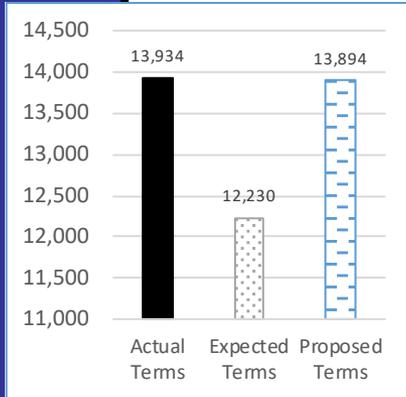




Termination Rates - <10 Years of Service Non Top 10 Non Hazardous Duty Females

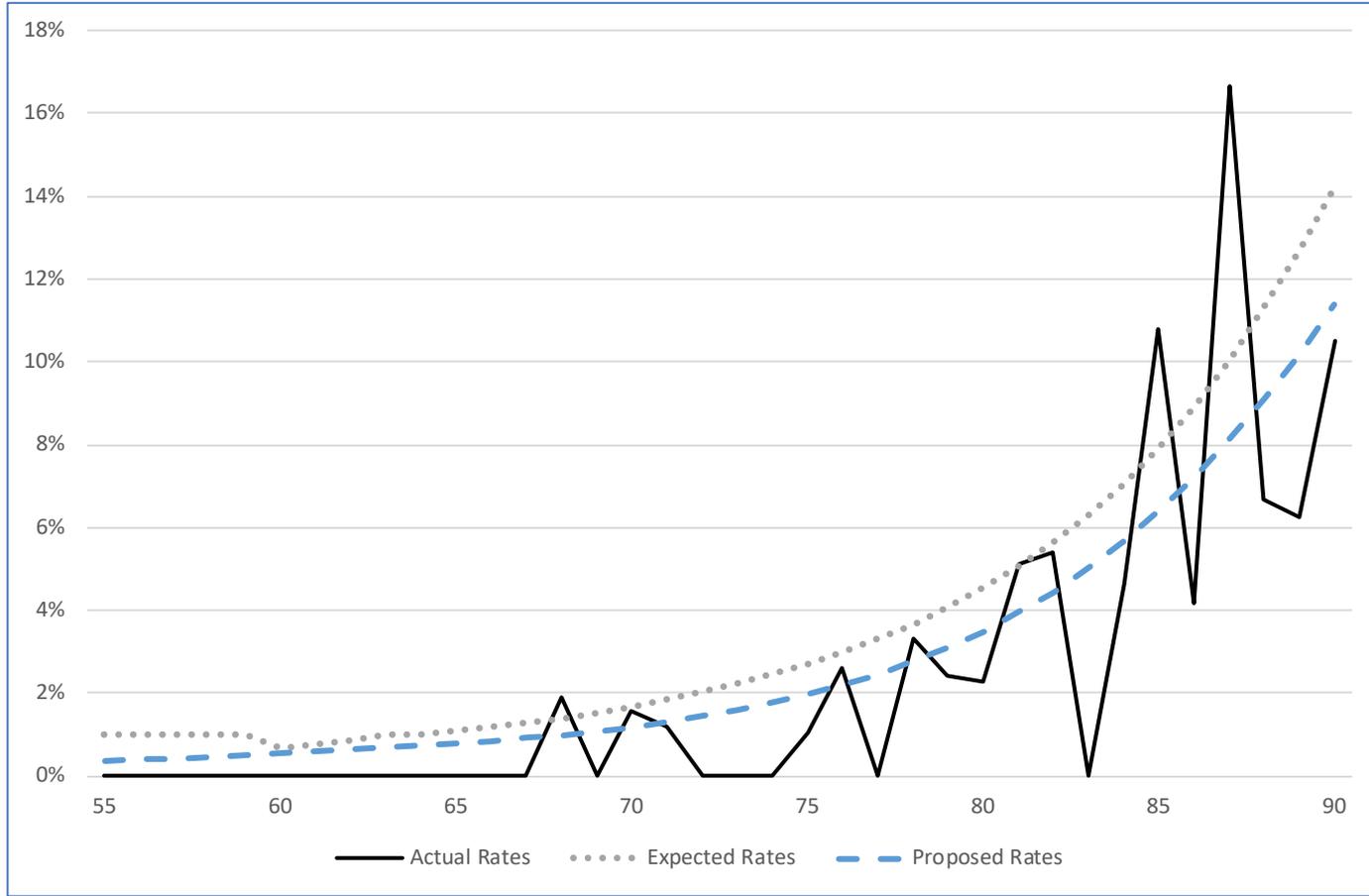
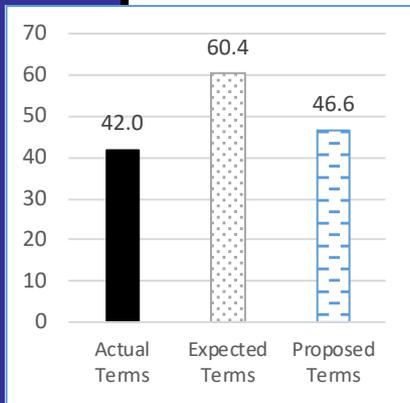


Comment: Rates adjusted to be closer to experience since the last experience review.



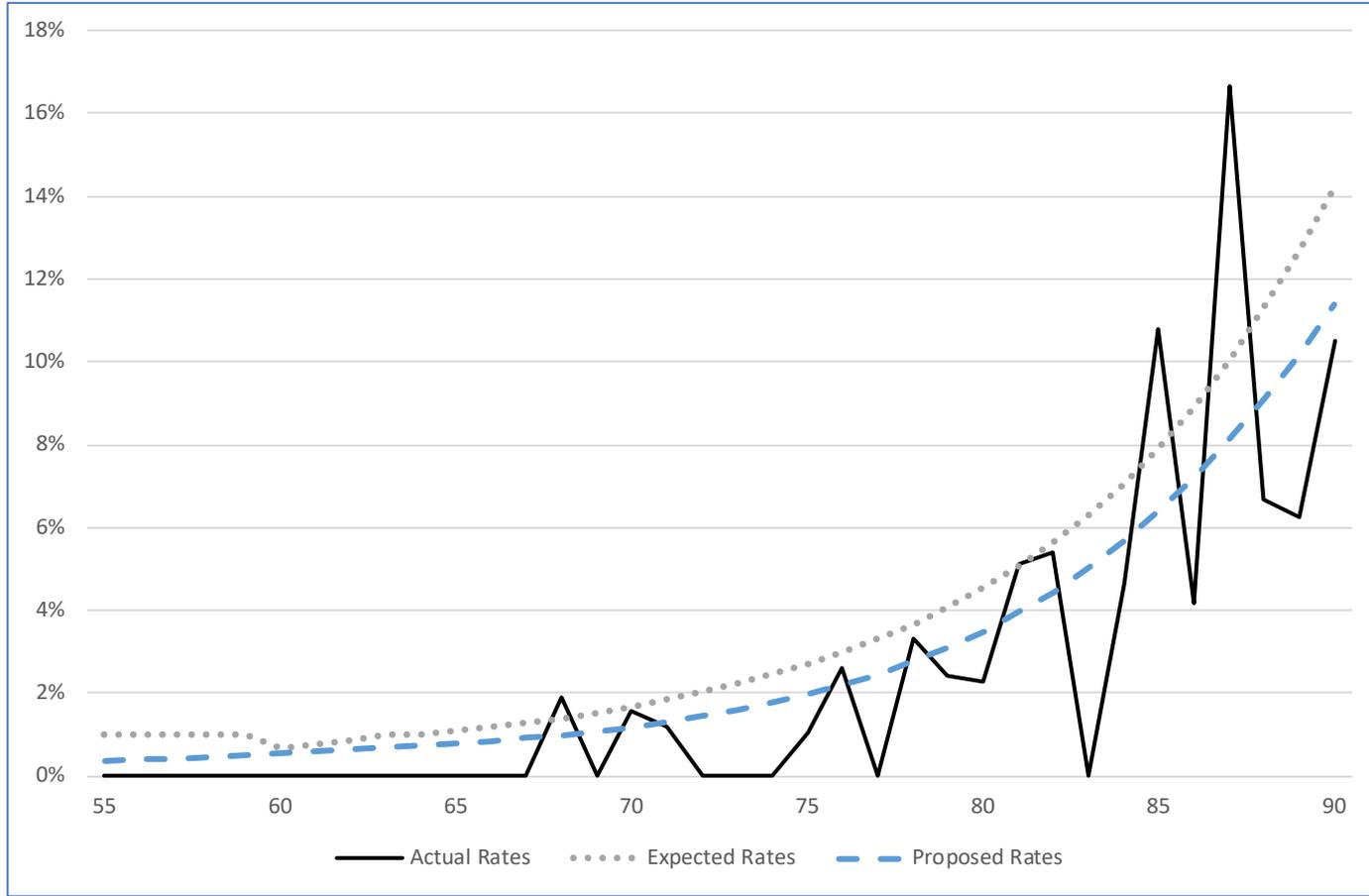
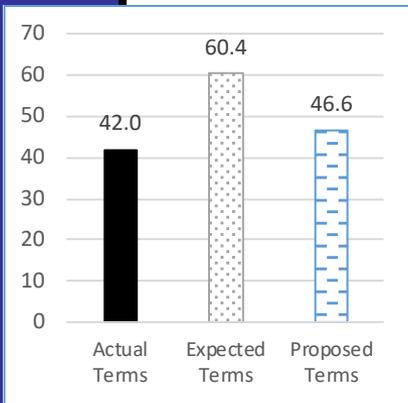


Termination Rates - <10 Years of Service Non Top 10 Hazardous Duty Males





Termination Rates - <10 Years of Service Non Top 10 Hazardous Duty Females

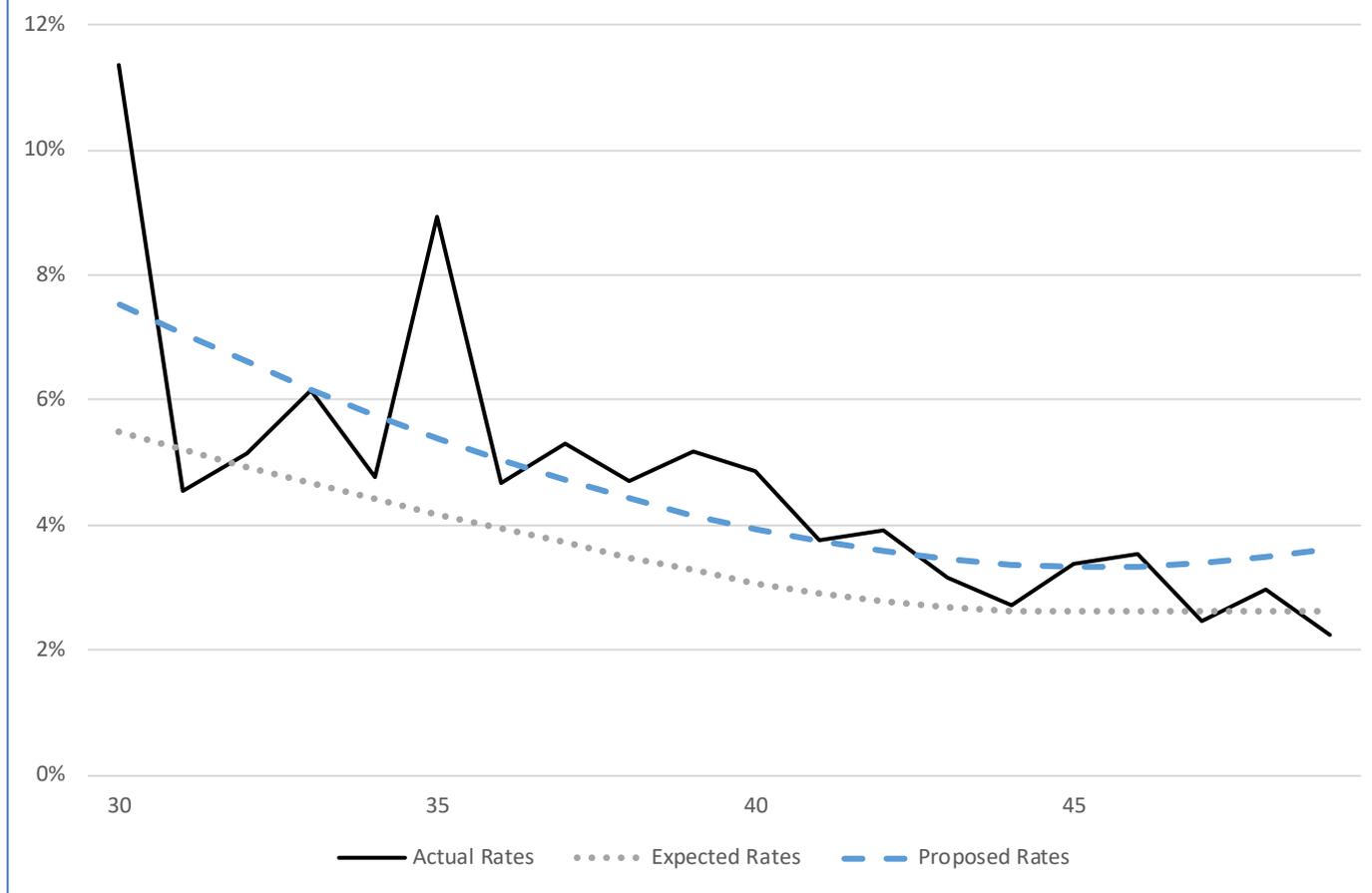
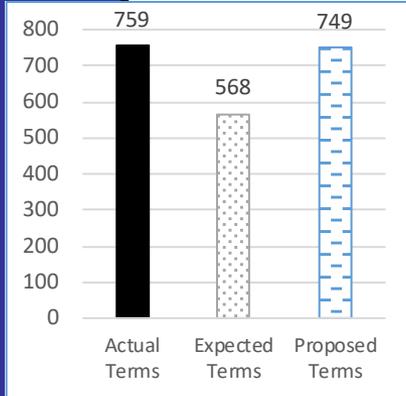




Termination Rates - 10 + Years of Service State Males



Comment: Rates adjusted to be closer to experience since the last experience review.



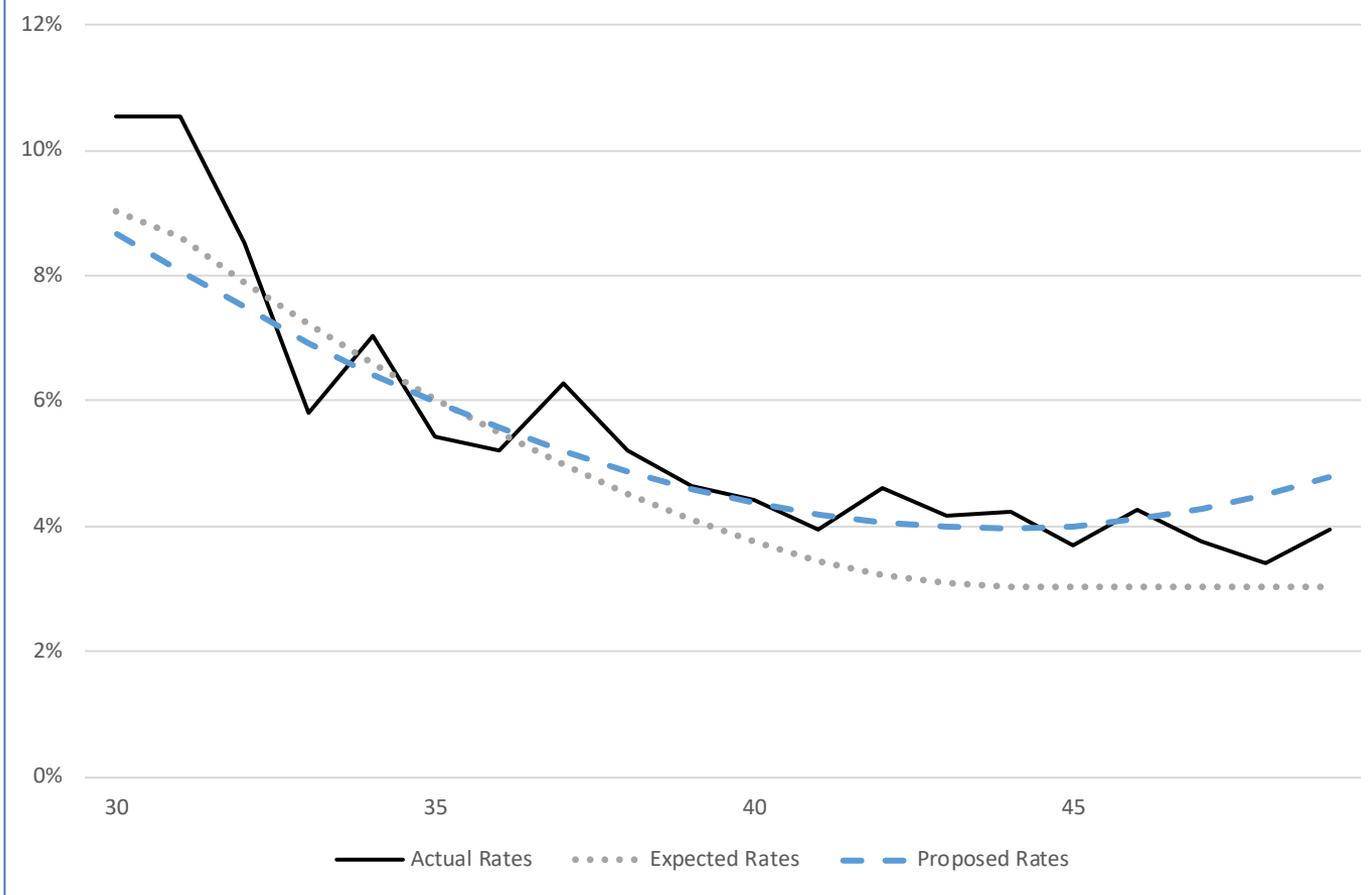
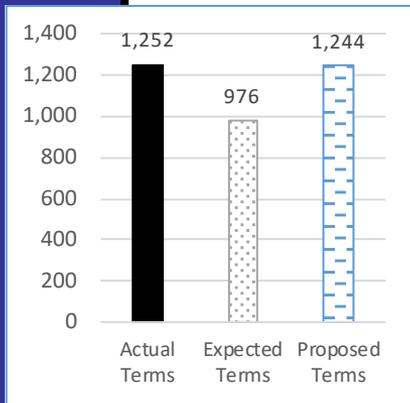


Termination Rates - 10 + Years of Service

State Females



Comment: Rates adjusted to be closer to experience since the last experience review.





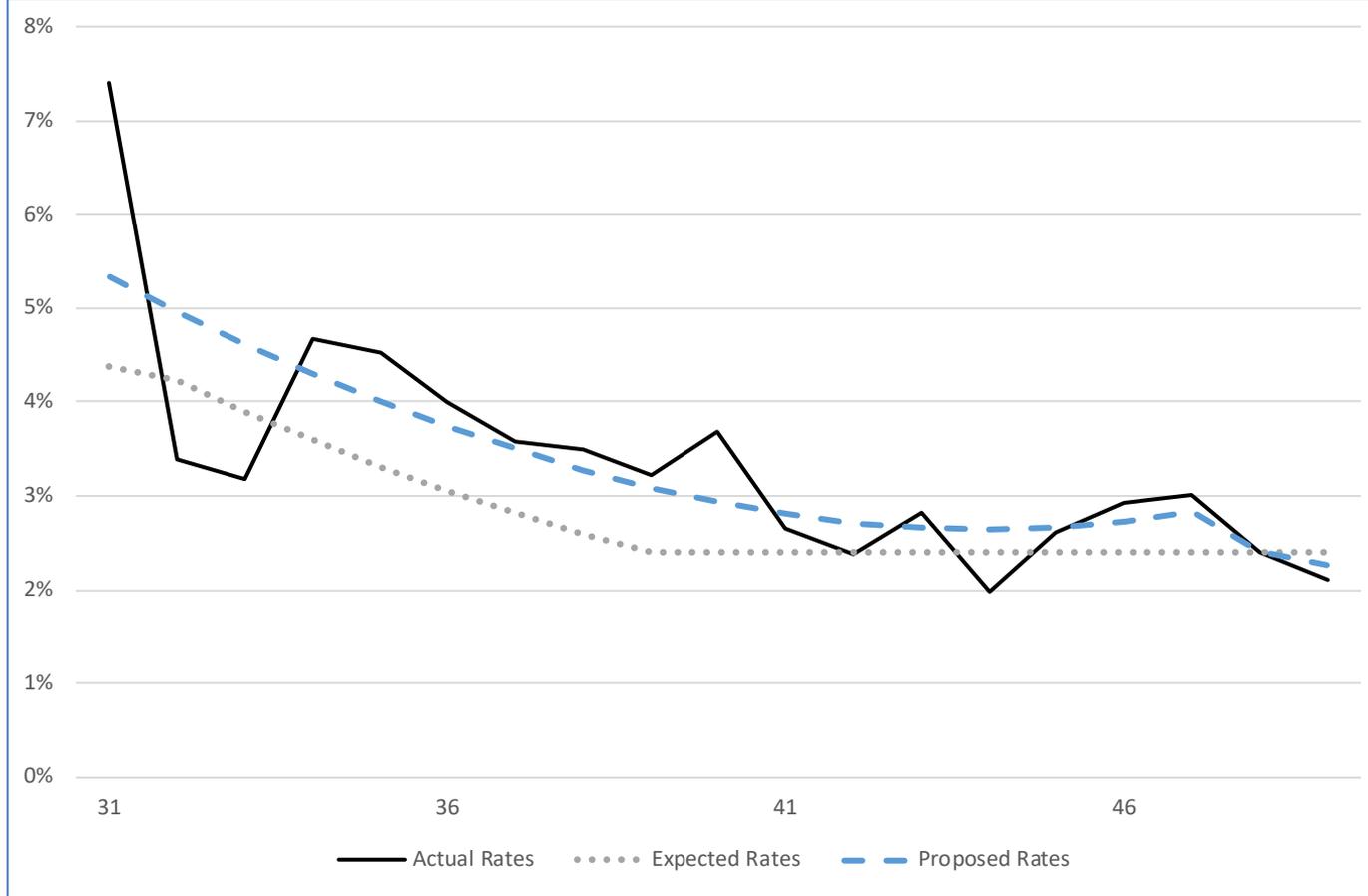
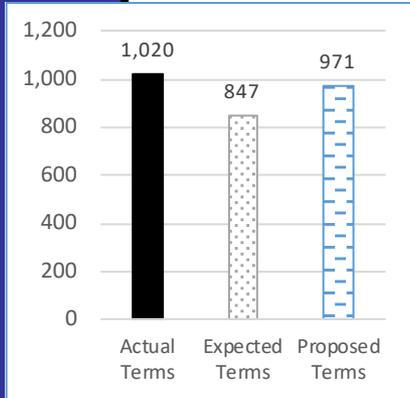
Termination Rates - 10 + Years of Service

Teachers

Males



Comment: Rates adjusted to be closer to experience since the last experience review.





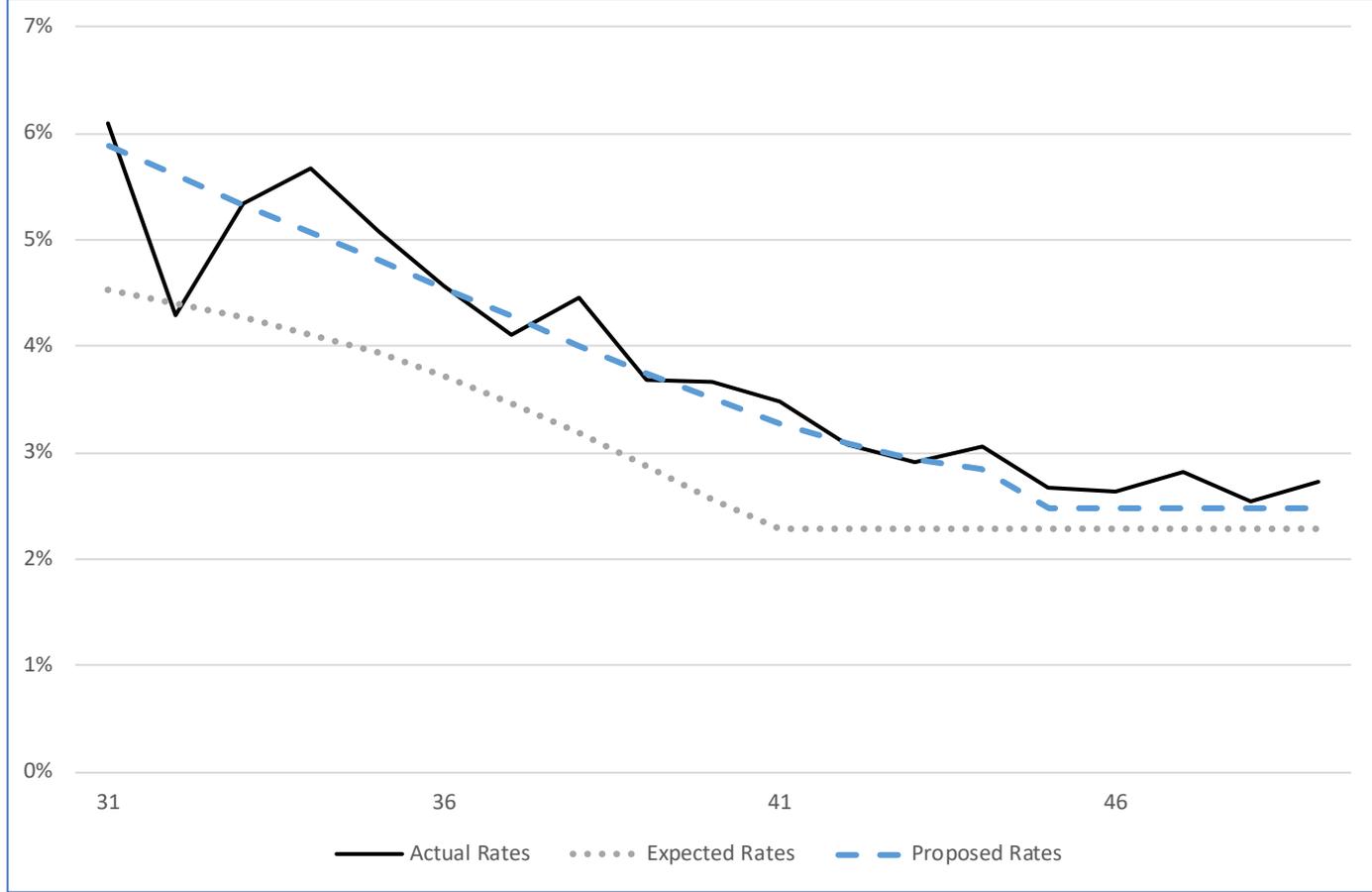
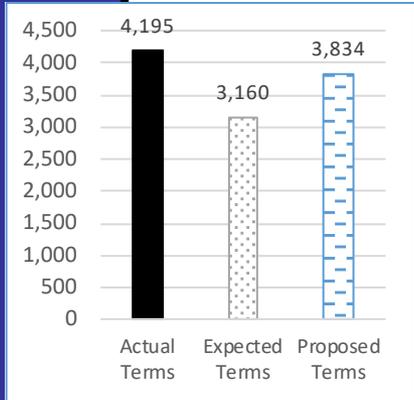
Termination Rates - 10 + Years of Service

Teachers

Females



Comment: Rates adjusted to be closer to experience since the last experience review.





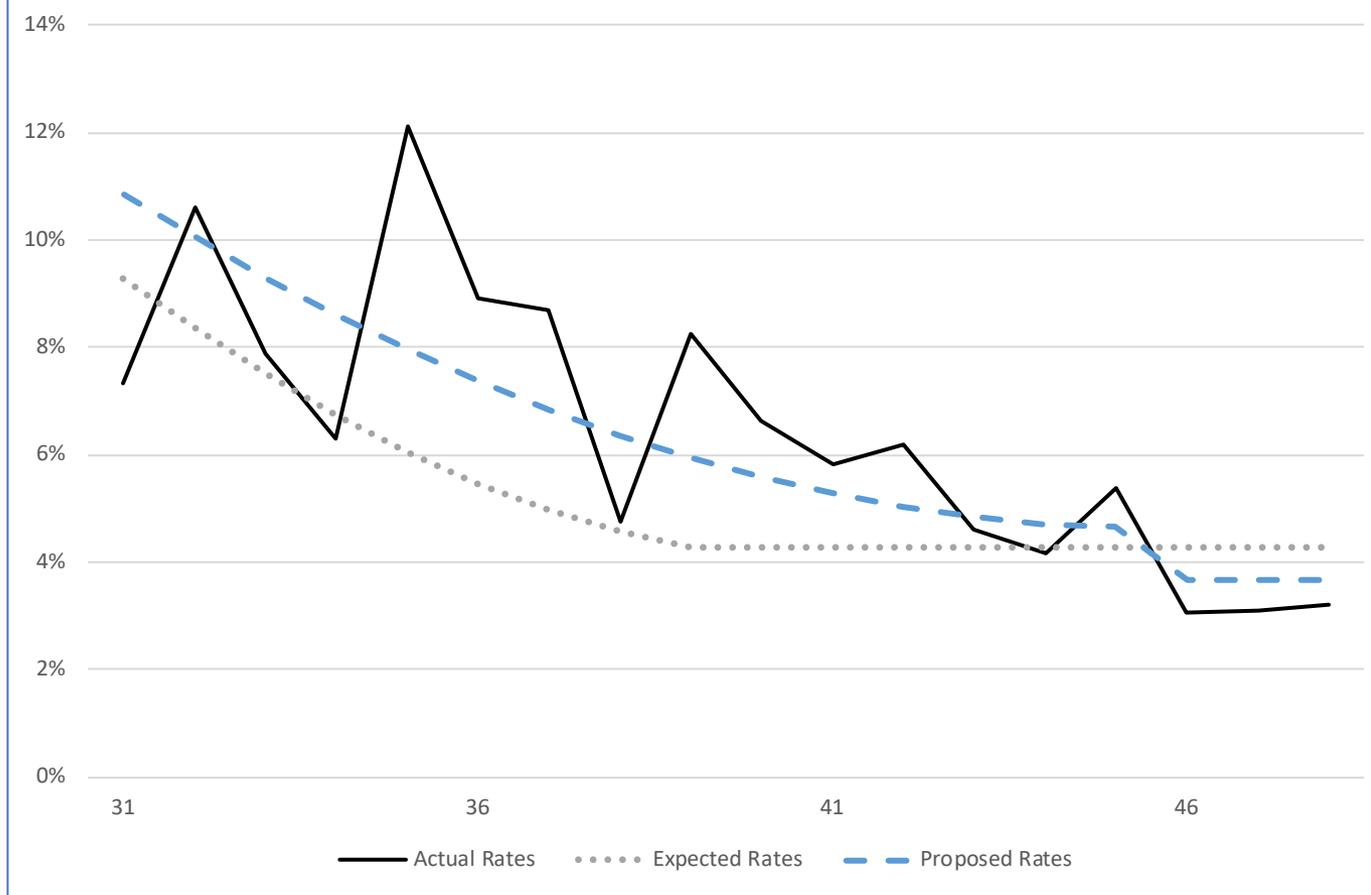
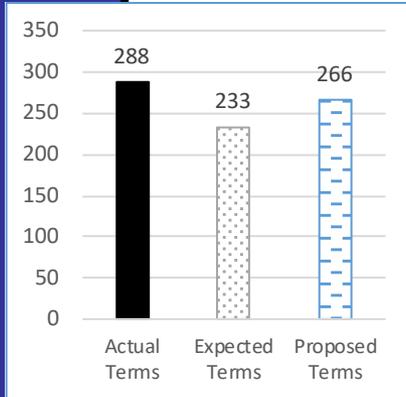
Termination Rates - 10 + Years of Service

VaLORS

Males



Comment: Rates adjusted to be closer to experience since the last experience review.





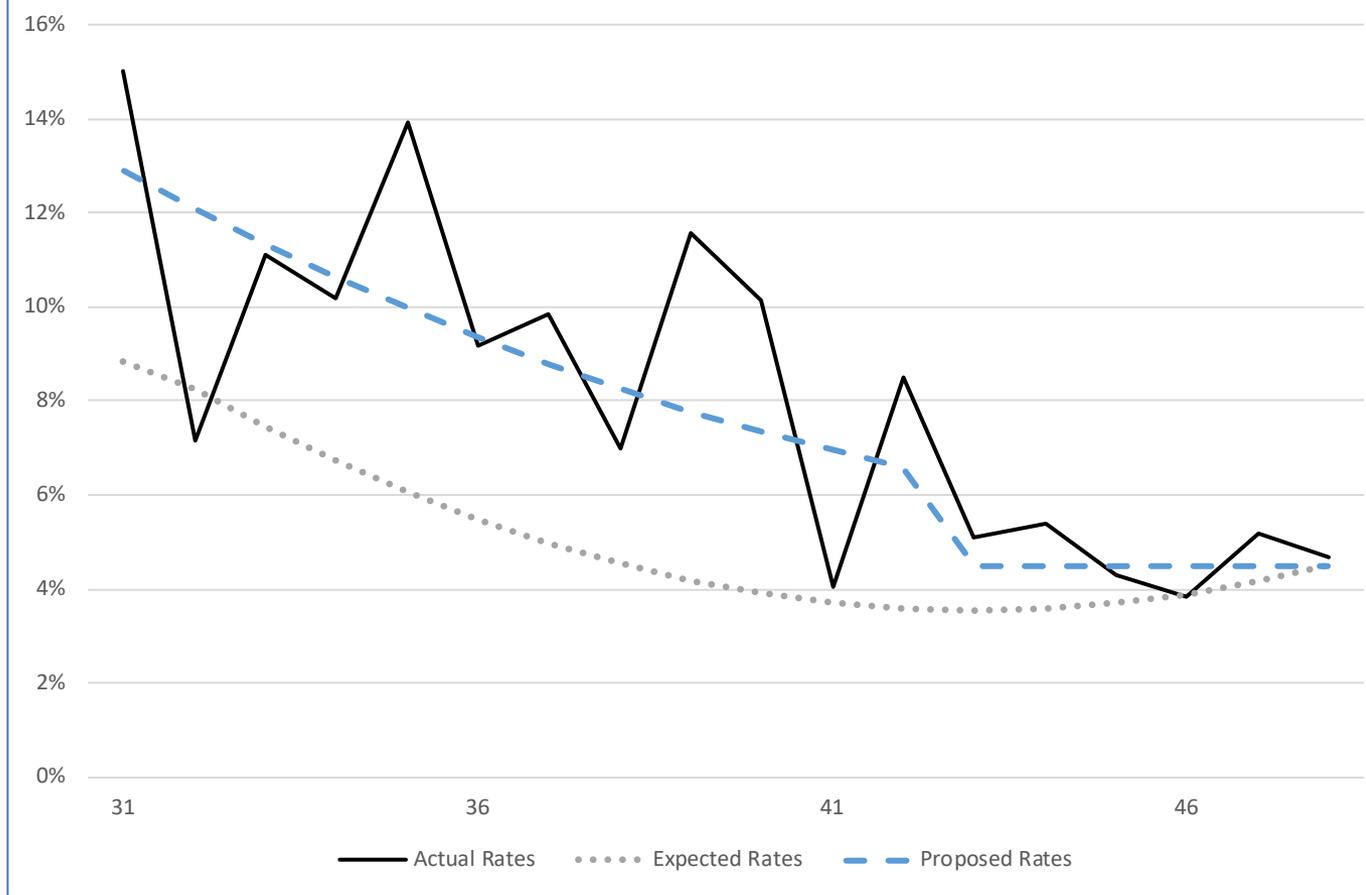
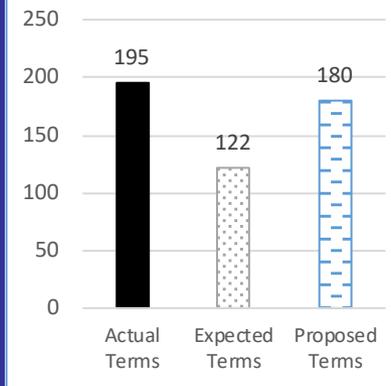
Termination Rates - 10 + Years of Service

VaLORS

Females



Comment: Rates adjusted to be closer to experience since the last experience review.



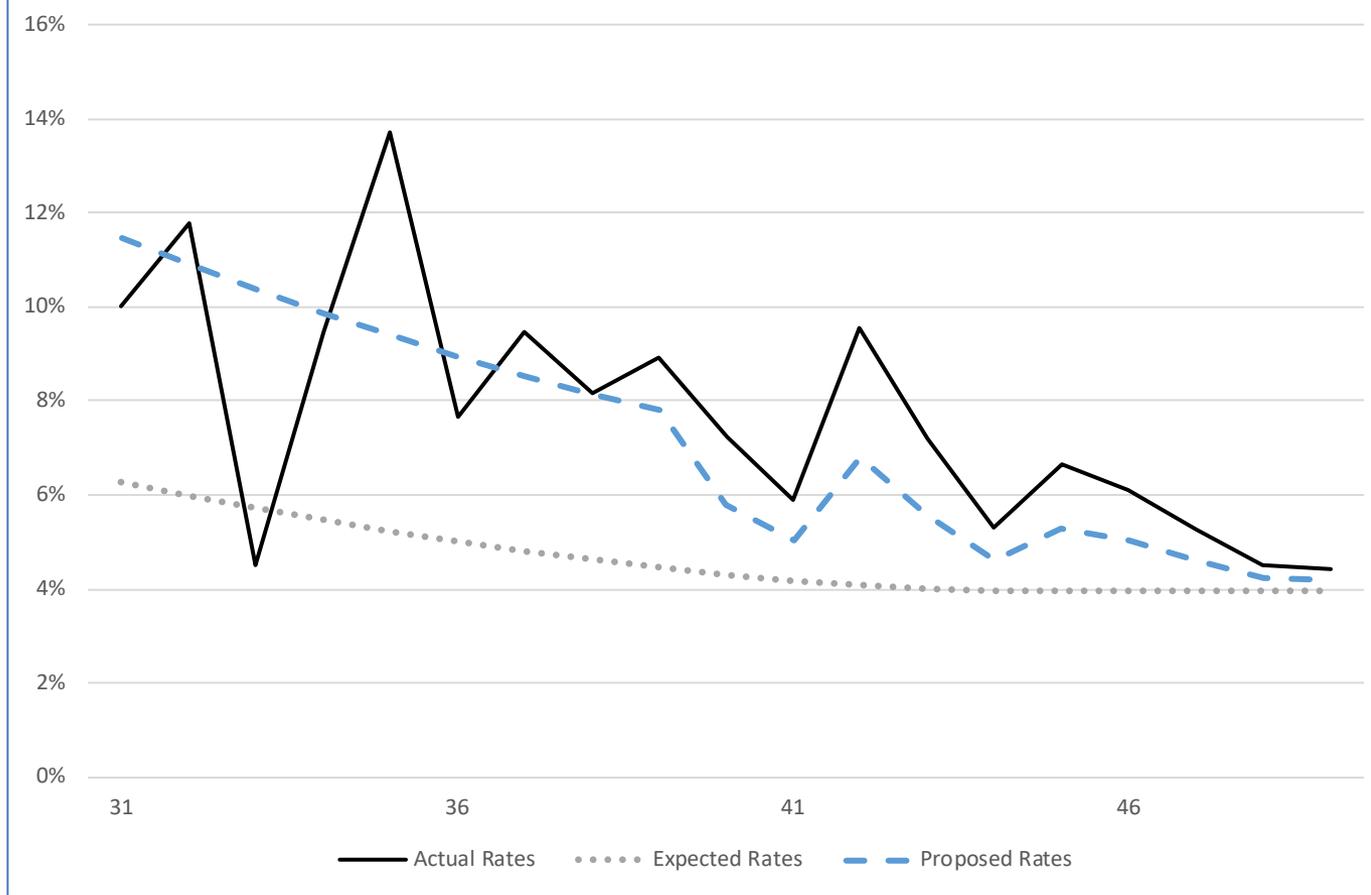
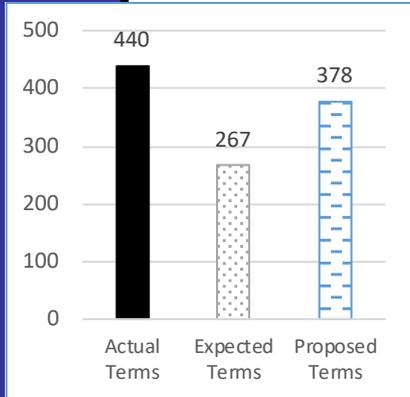


Termination Rates - 10 + Years of Service

Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.



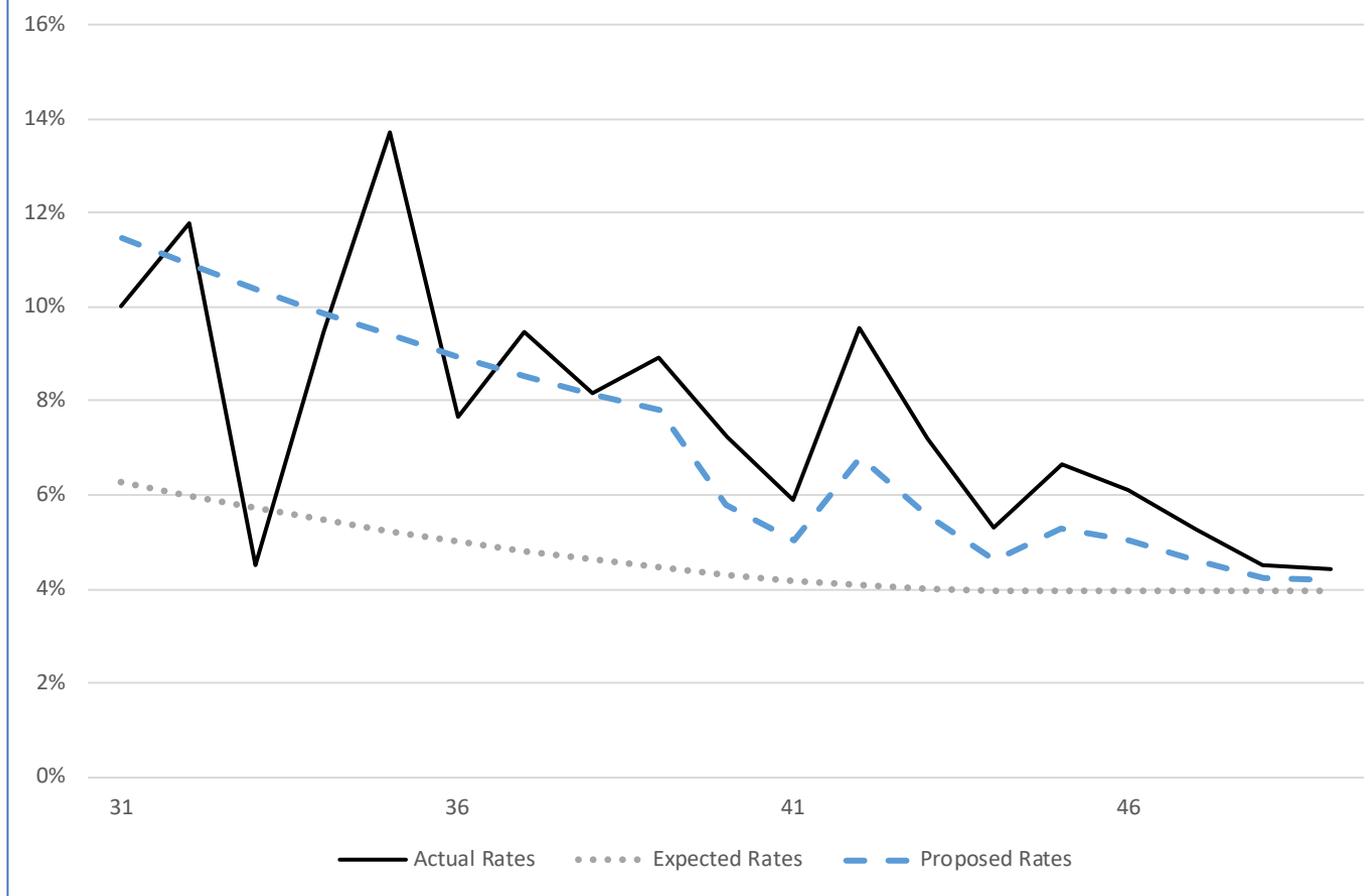
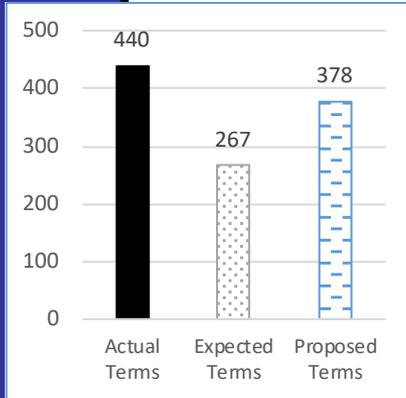


Termination Rates - 10 + Years of Service

Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.



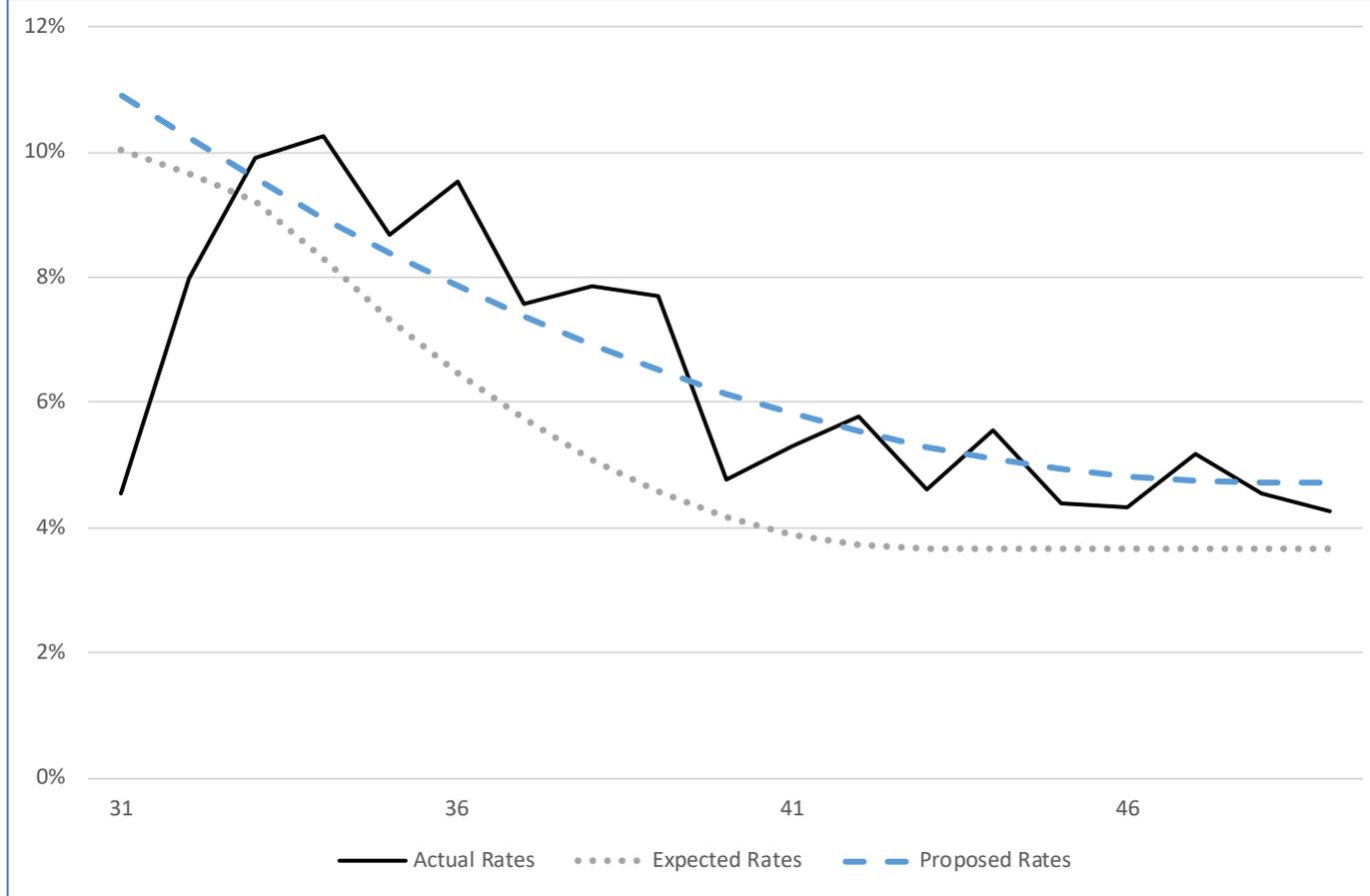
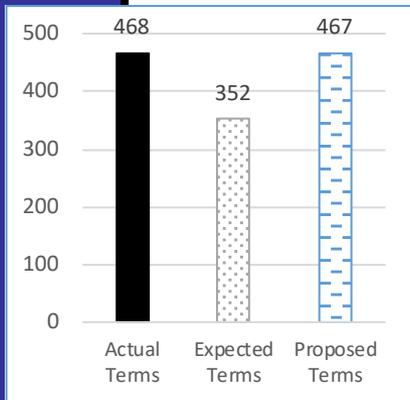


Termination Rates - 10 + Years of Service

Top 10 Non Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review.



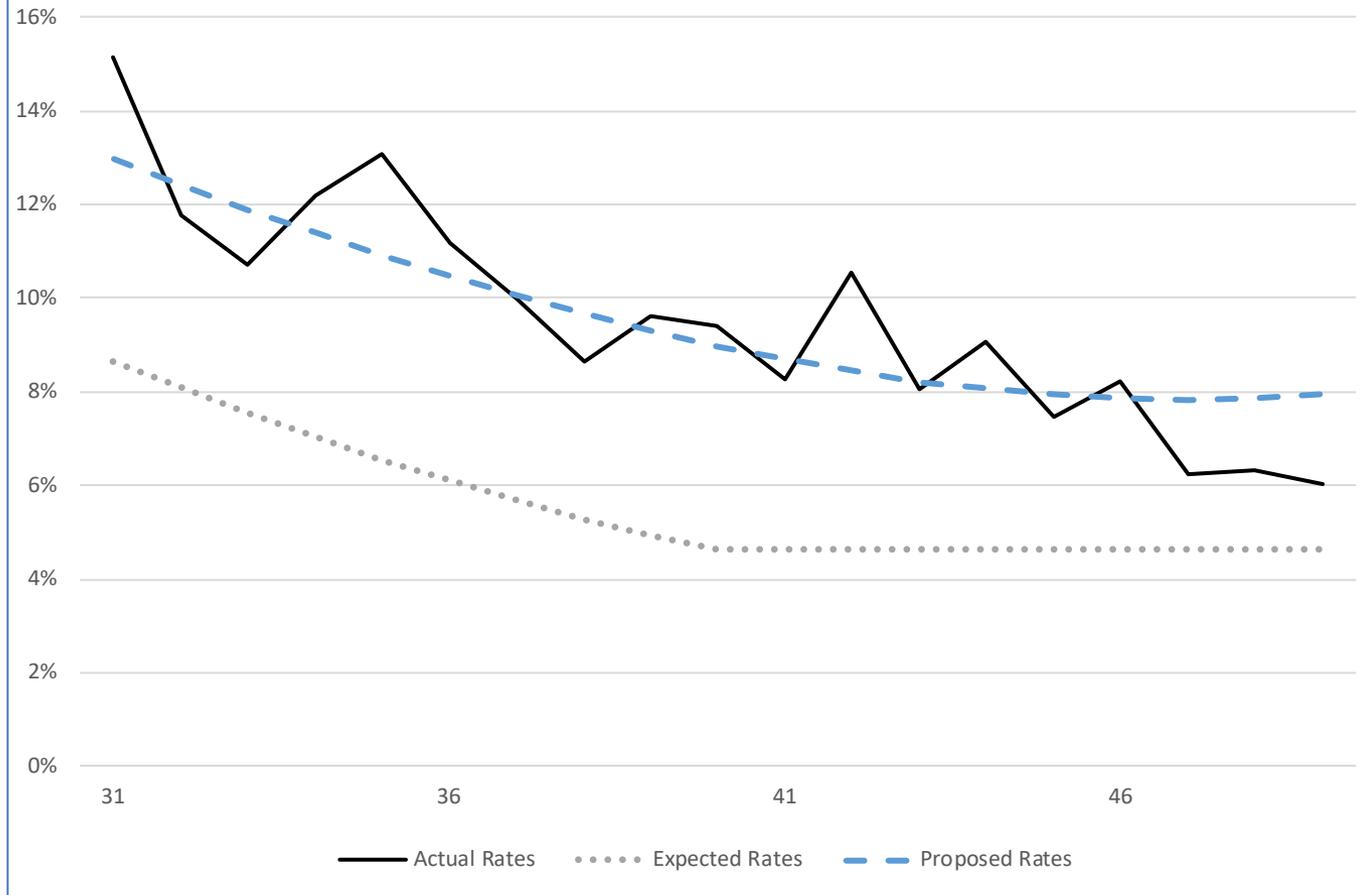
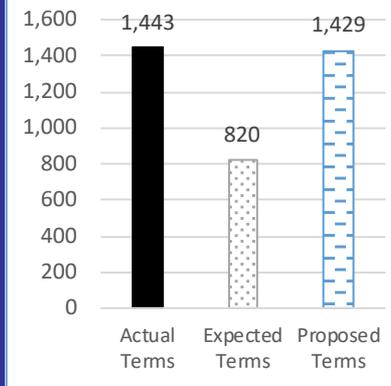


Termination Rates - 10 + Years of Service

Non Top 10 Non Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.

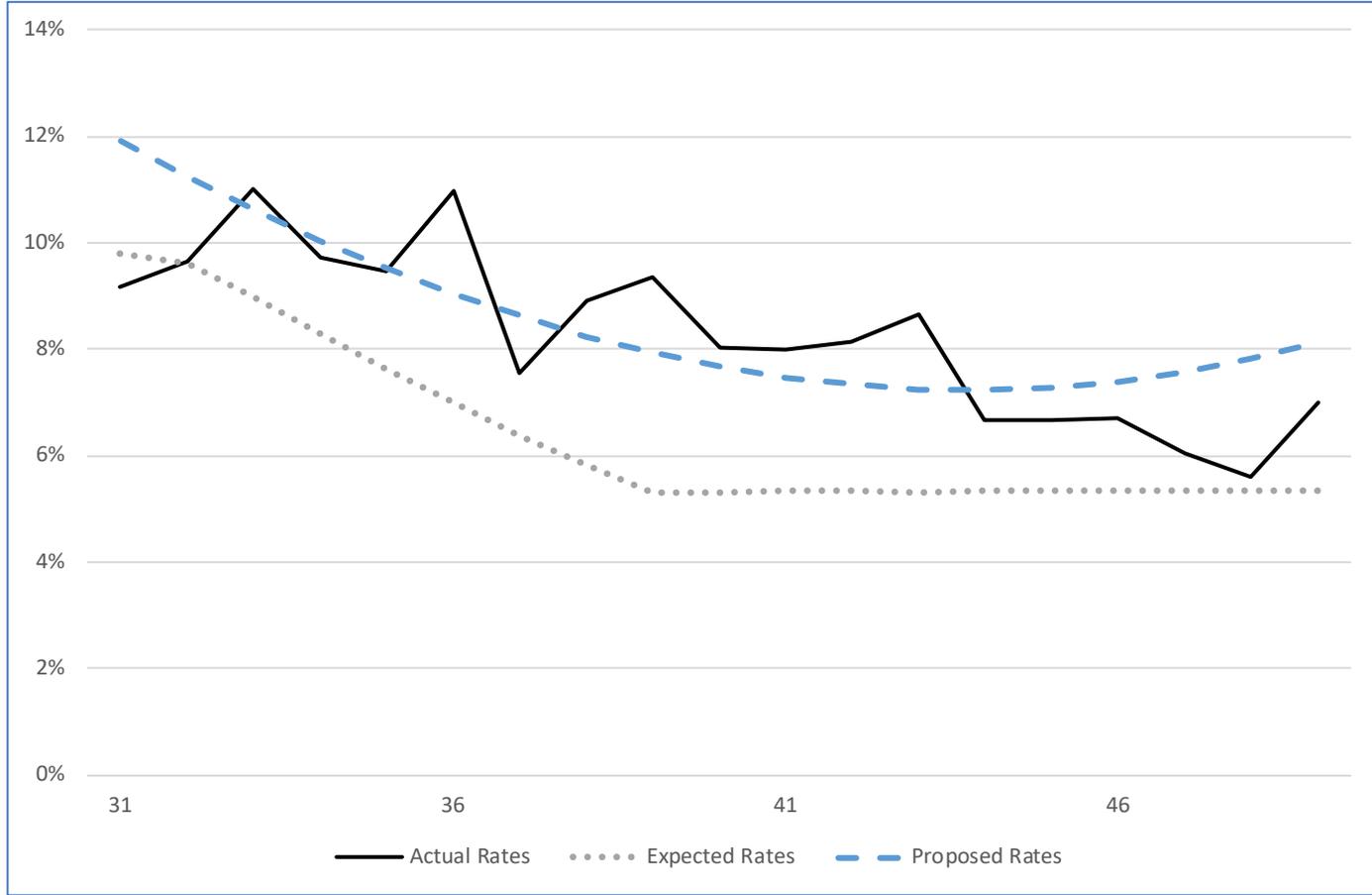
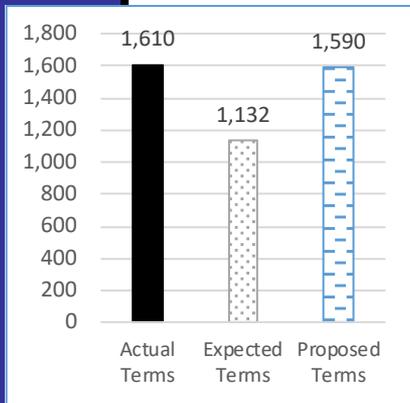




Termination Rates - 10 + Years of Service Non Top 10 Non Hazardous Duty Females



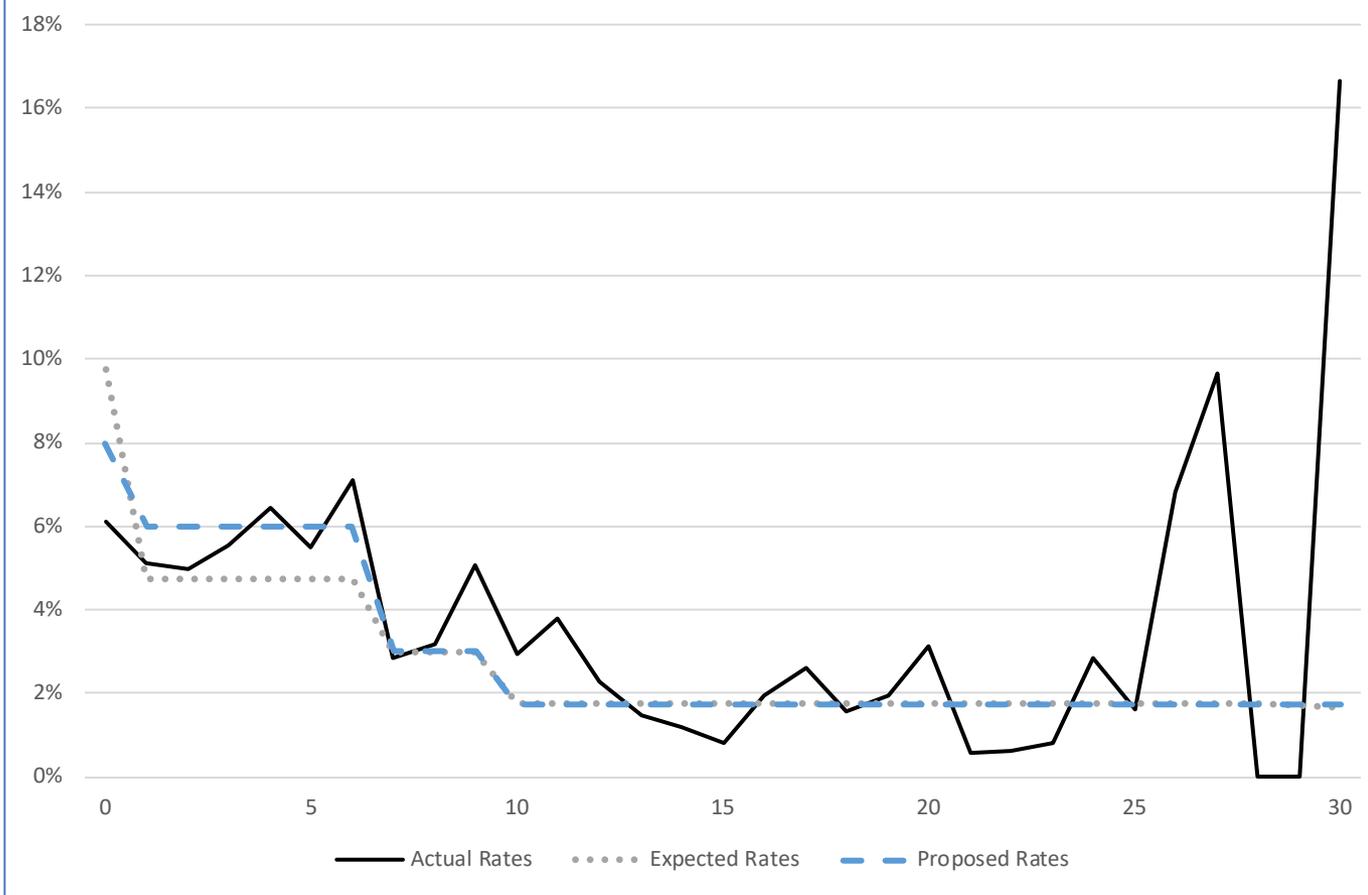
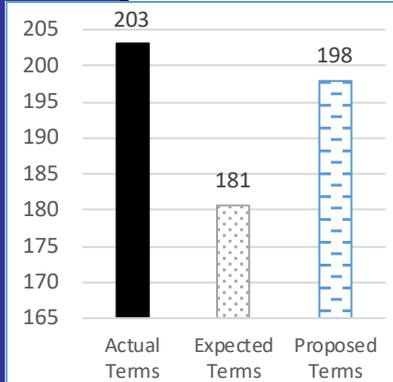
Comment: Rates adjusted to be closer to experience since the last experience review.





Termination Rates SPORS Males and Females

Comment: Rates adjusted to be closer to experience since the last experience review.

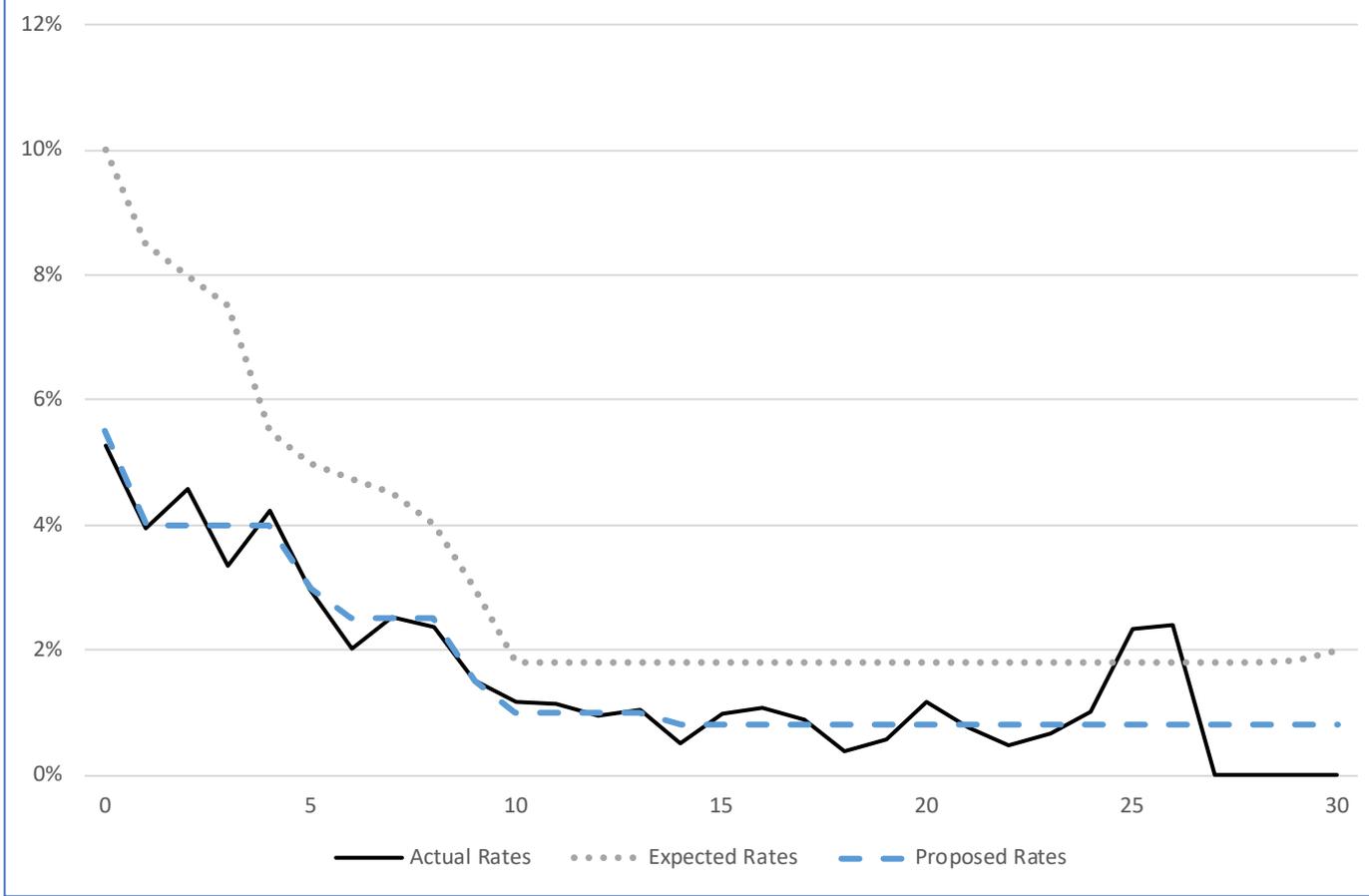
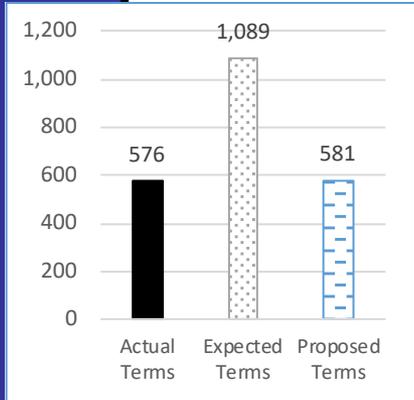




Termination Rates Top 10 Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.

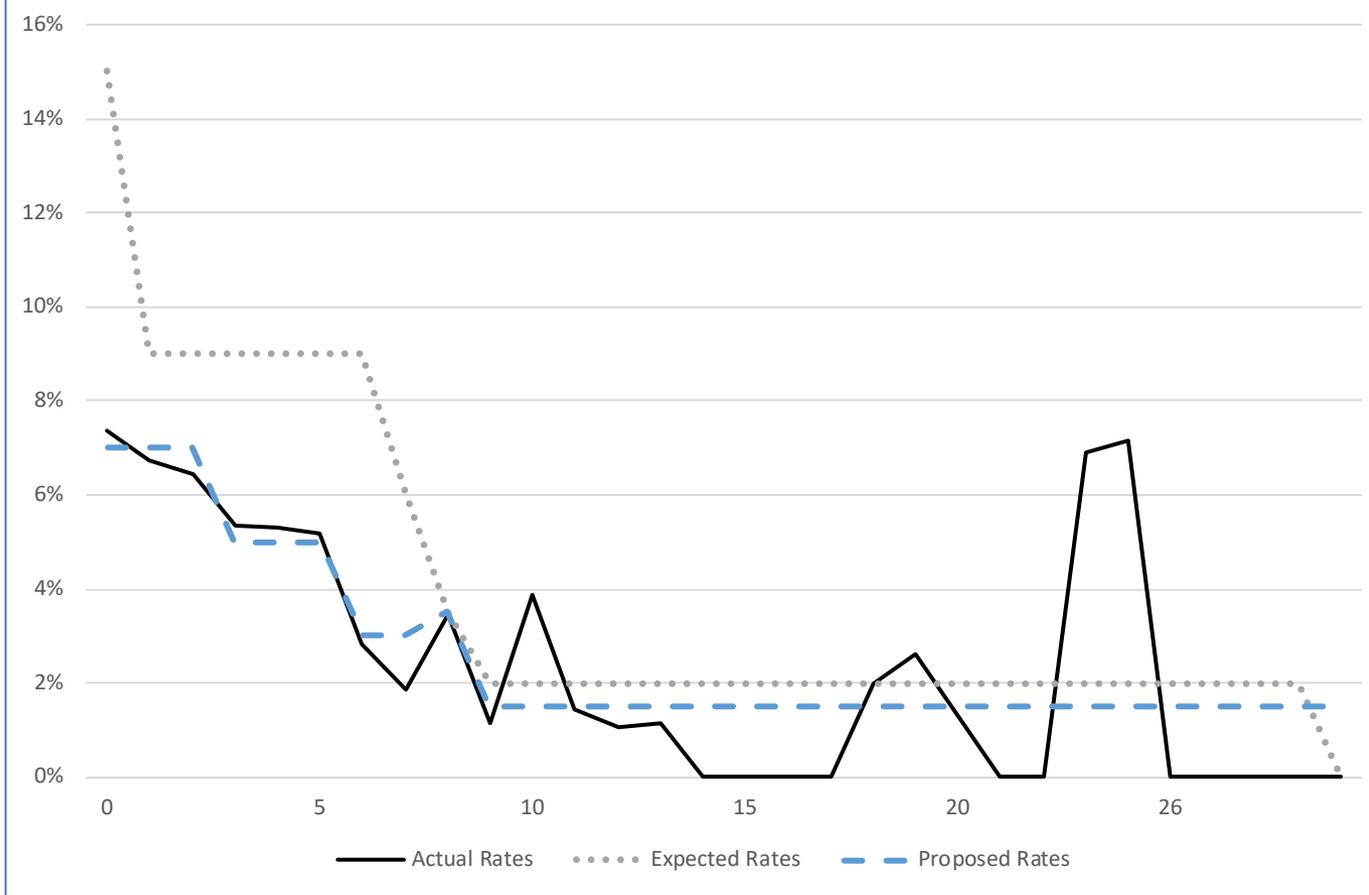
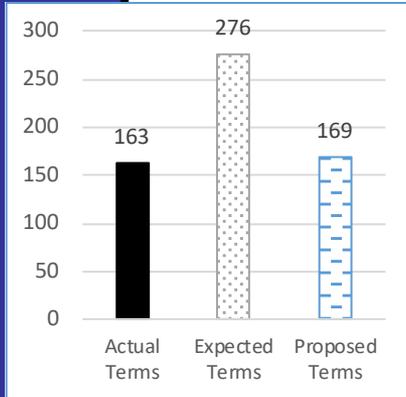




Termination Rates Top 10 Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review.

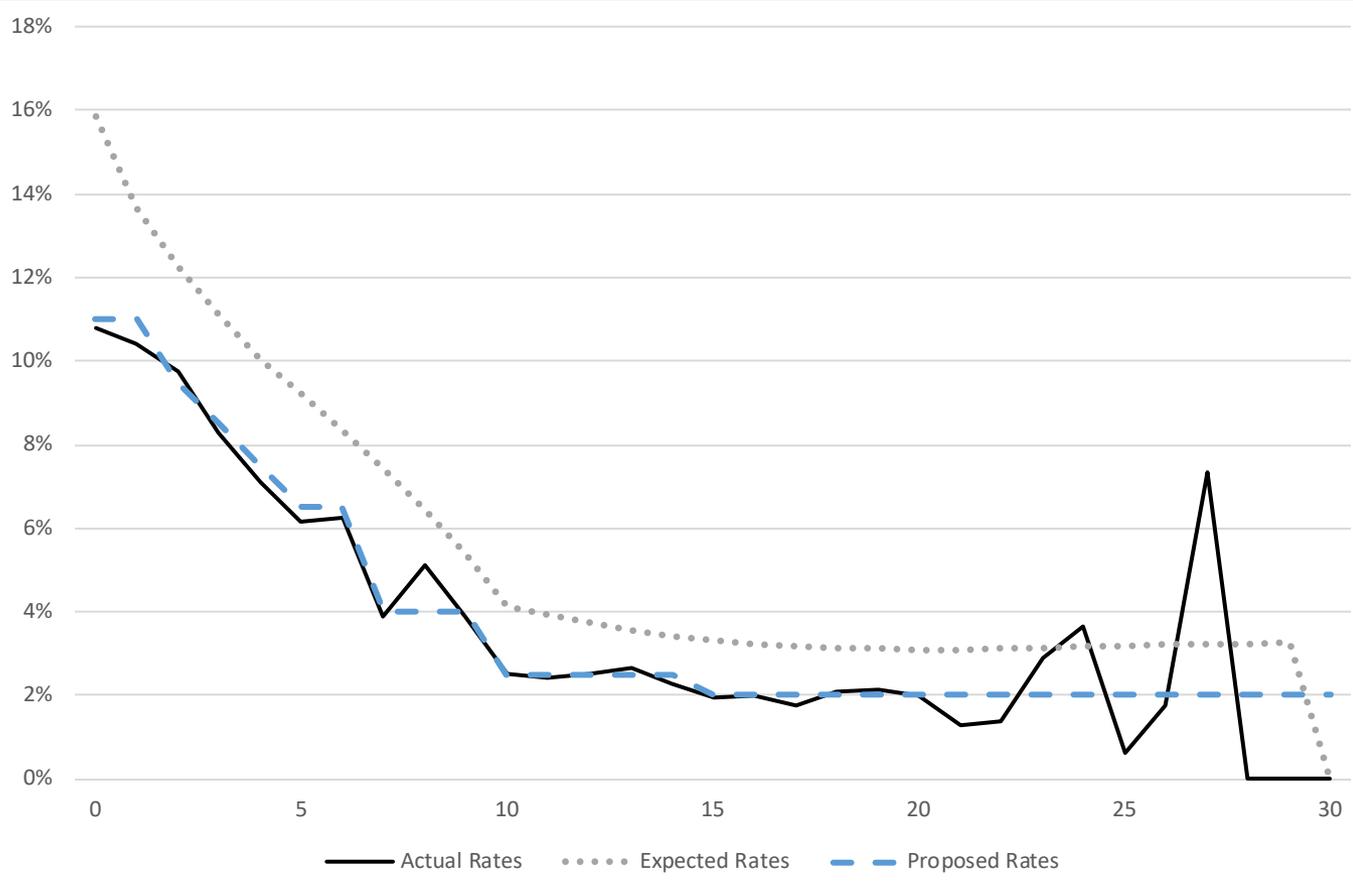
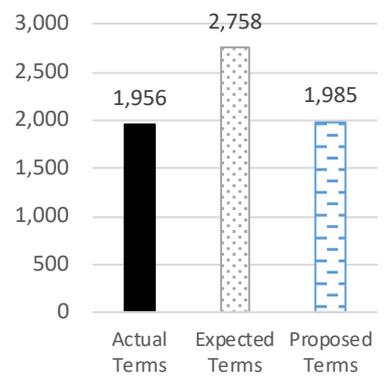




Termination Rates Non Top 10 Hazardous Duty Males



Comment: Rates adjusted to be closer to experience since the last experience review.

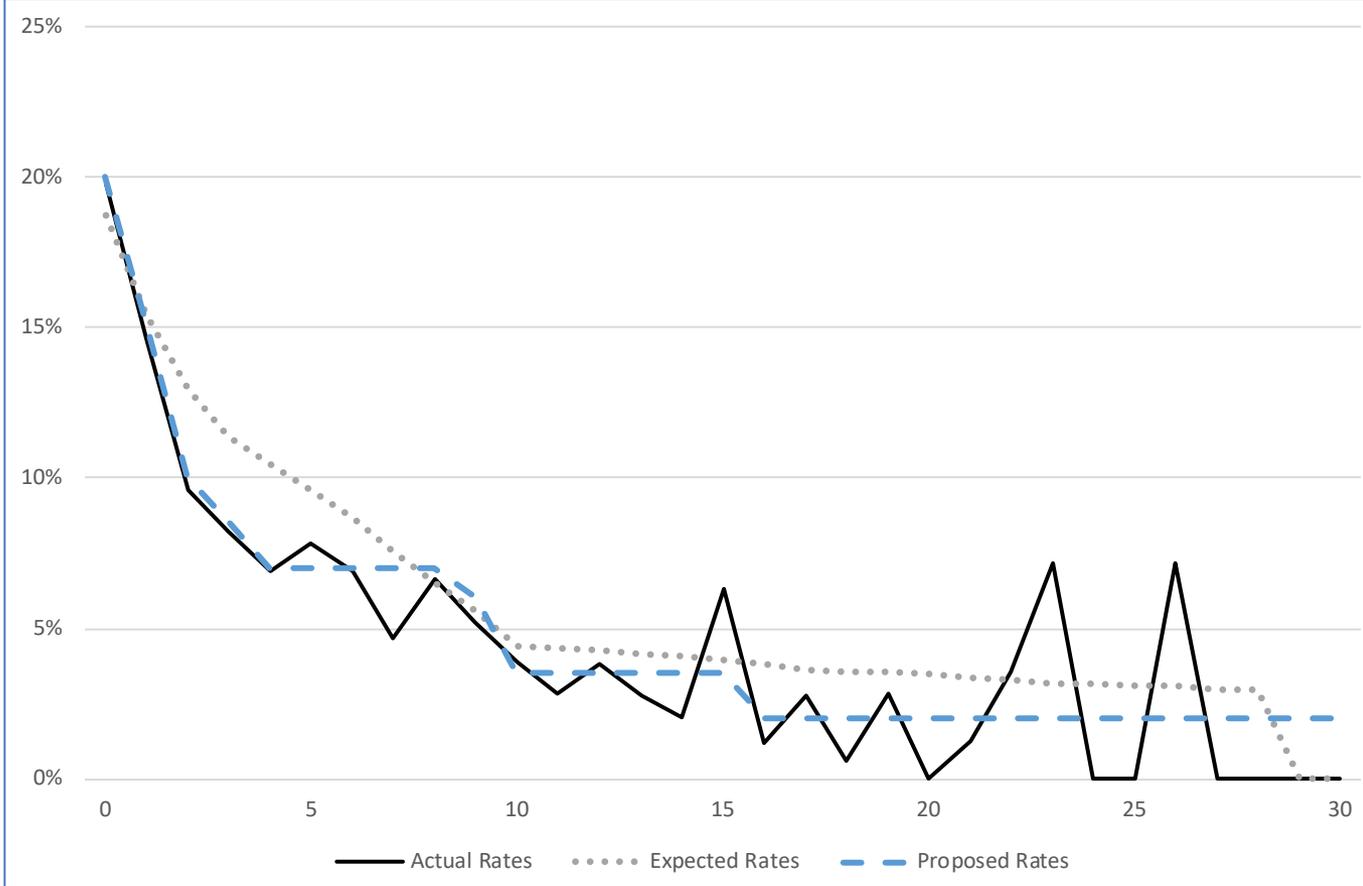
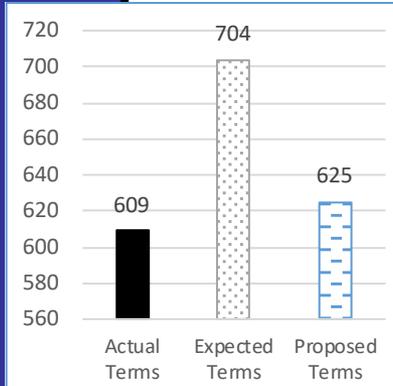




Termination Rates Non Top 10 Hazardous Duty Females



Comment: Rates adjusted to be closer to experience since the last experience review.

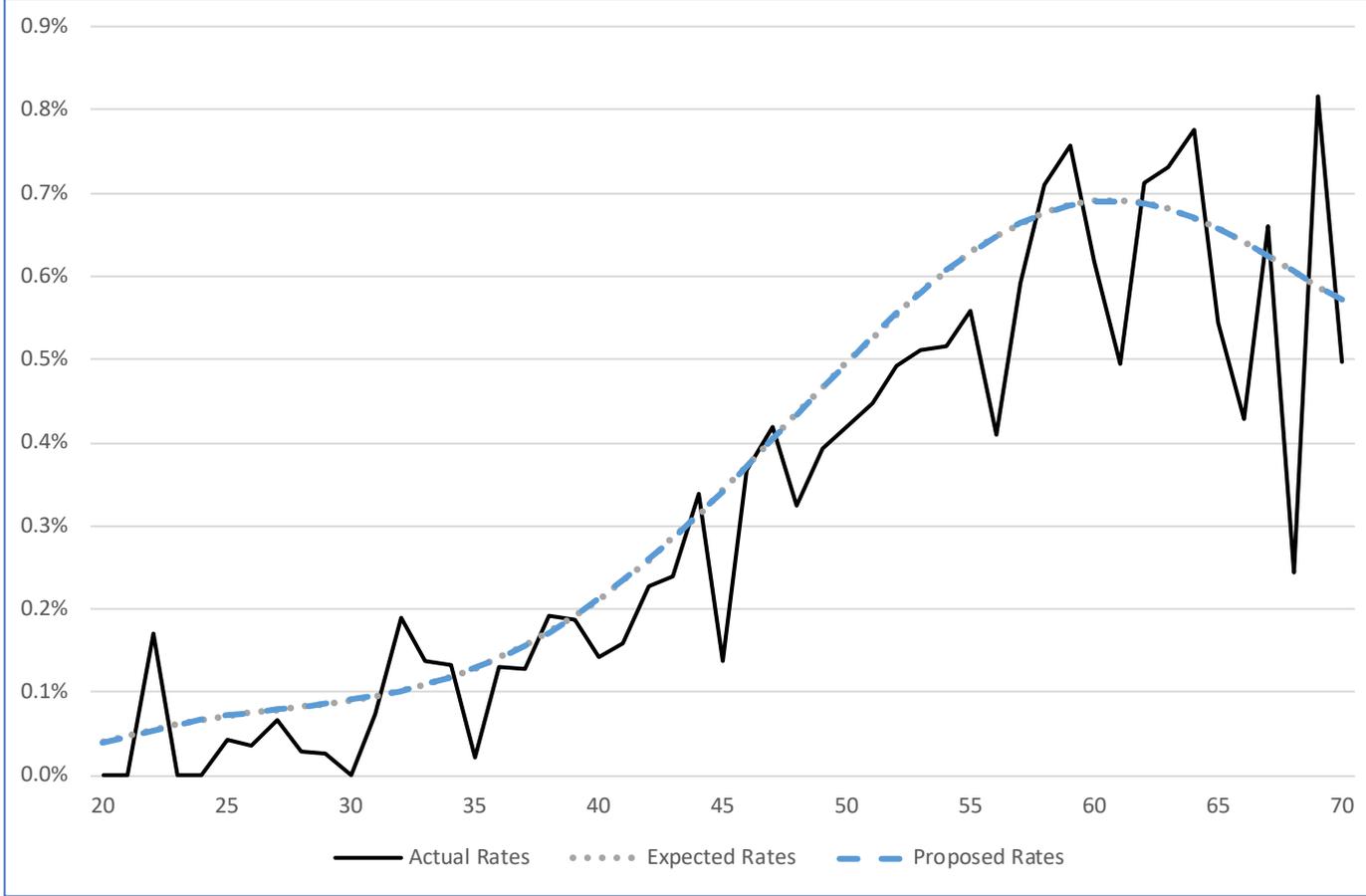
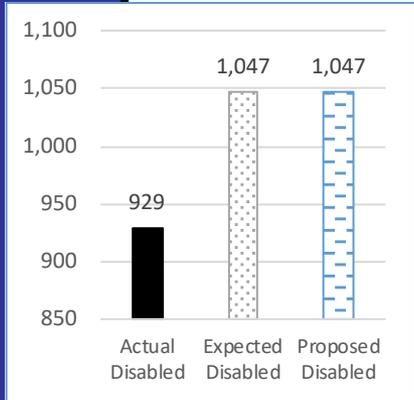




Disability Rates State Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

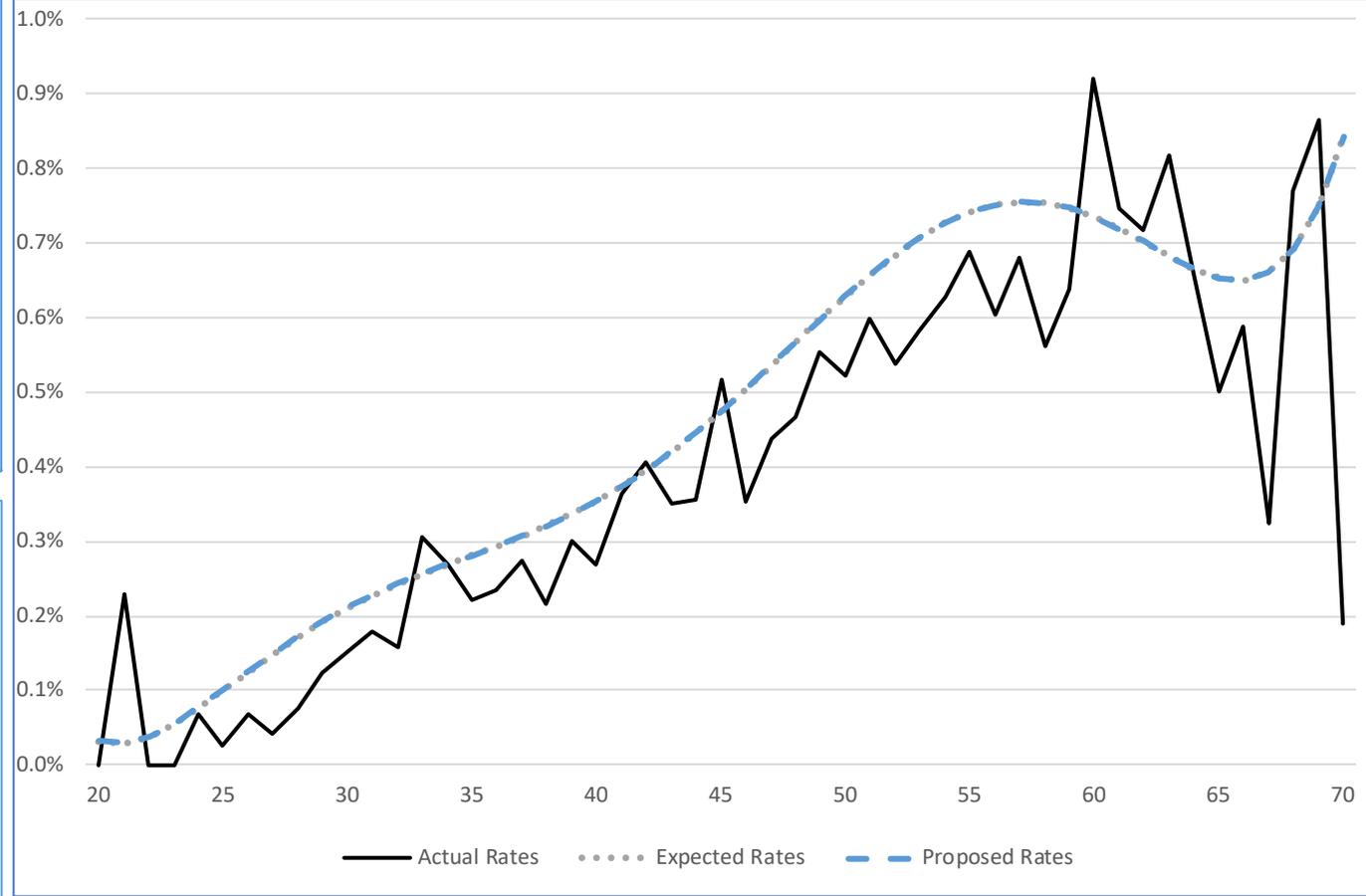
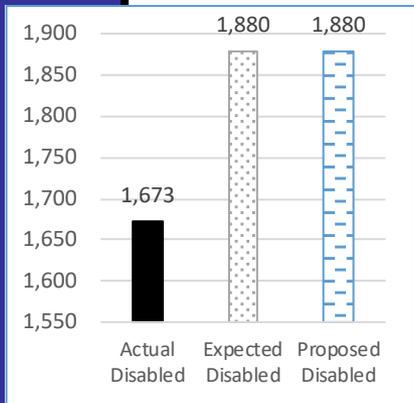




Disability Rates State Females



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

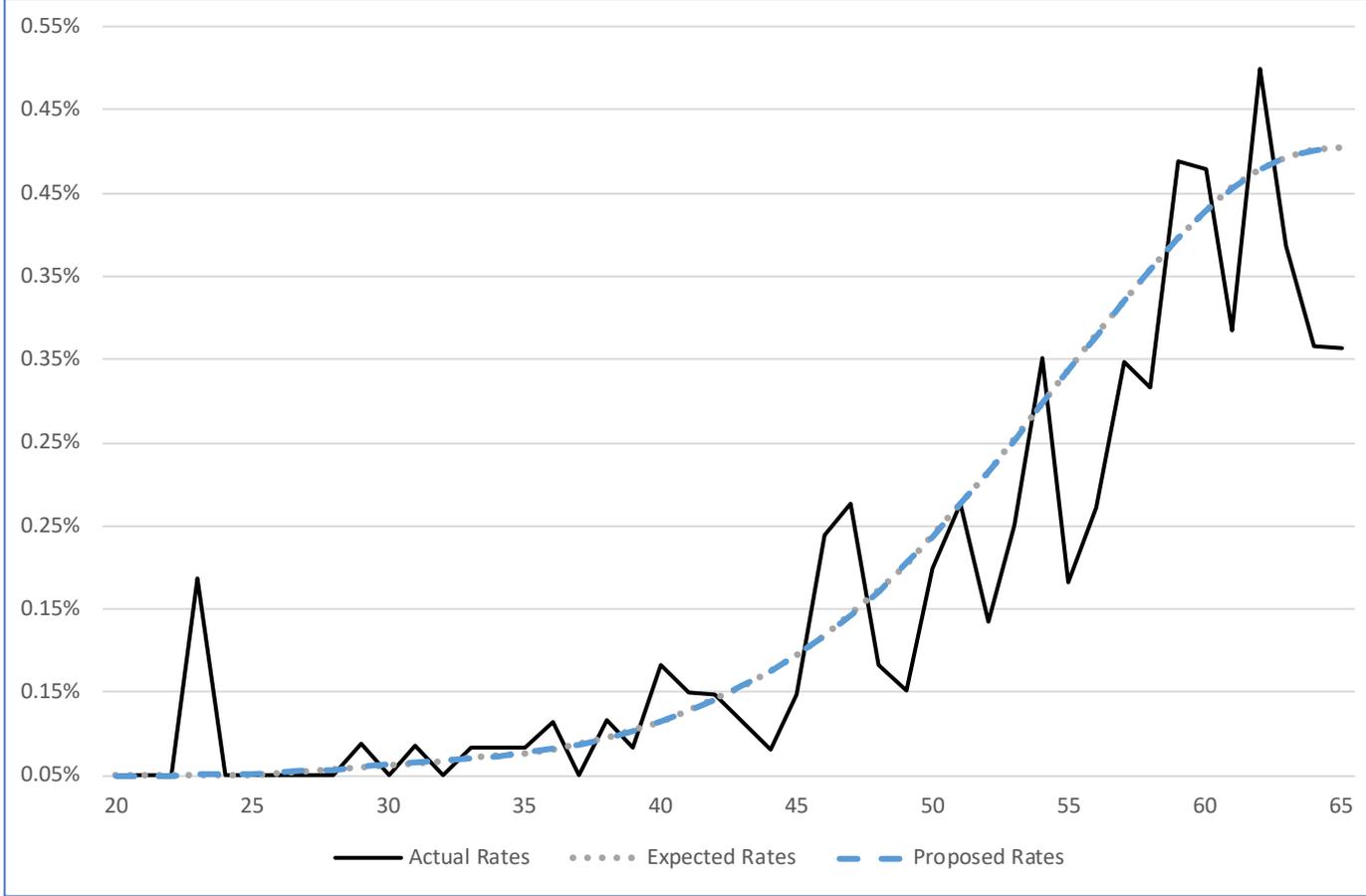
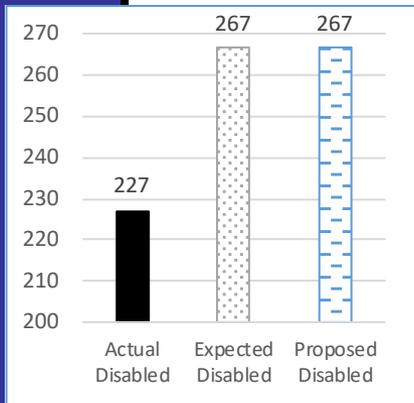




Disability Rates Teachers Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

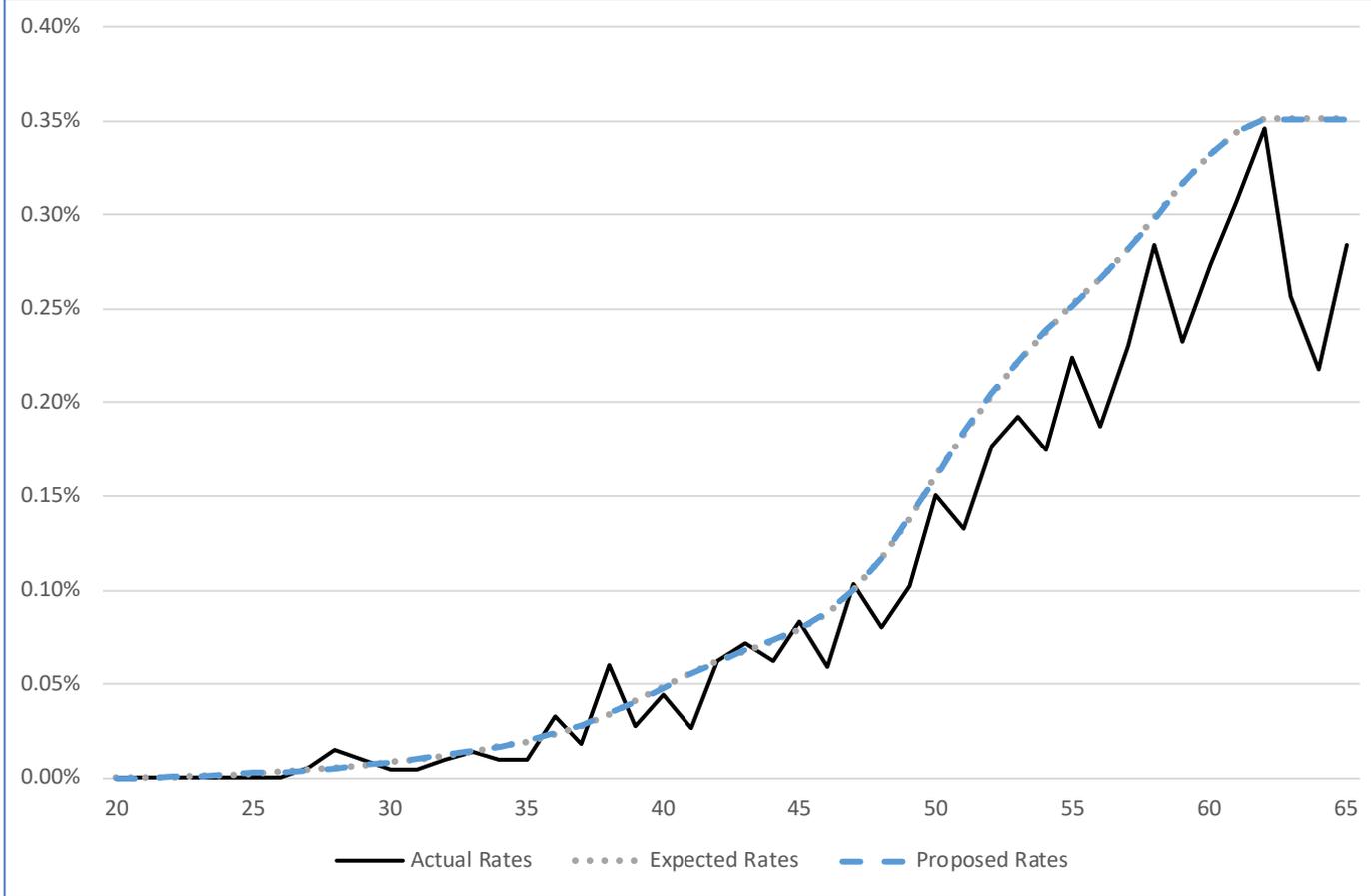
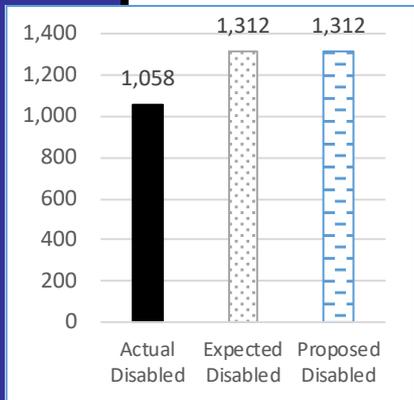




Disability Rates Teachers Females



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

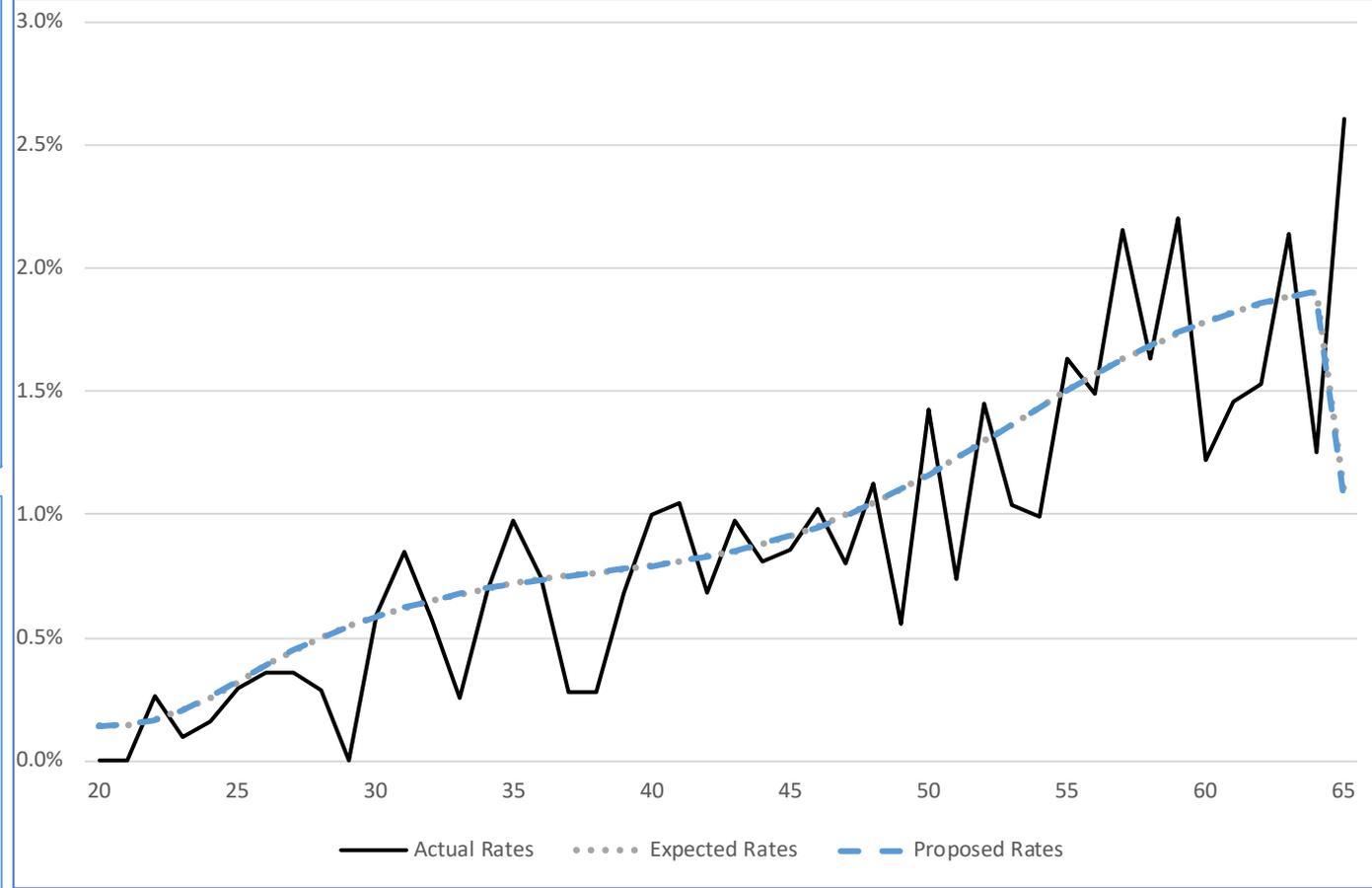
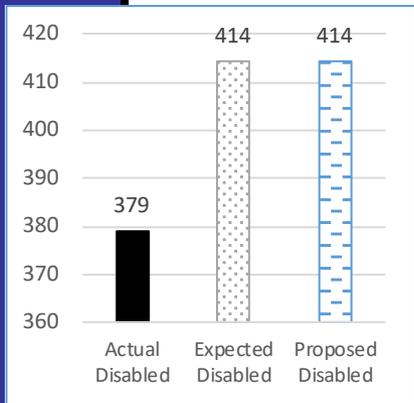




Disability Rates VaLORS Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

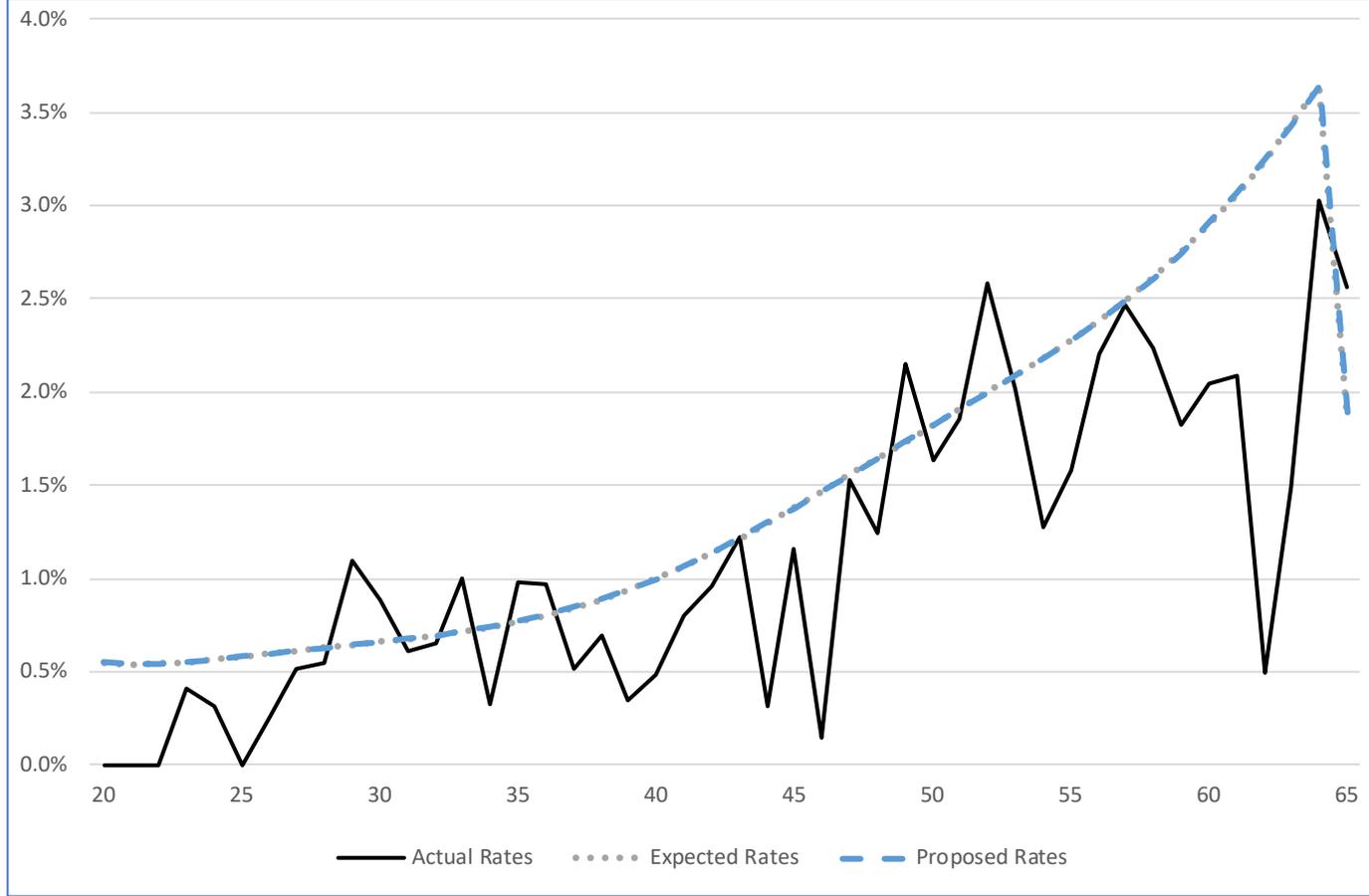
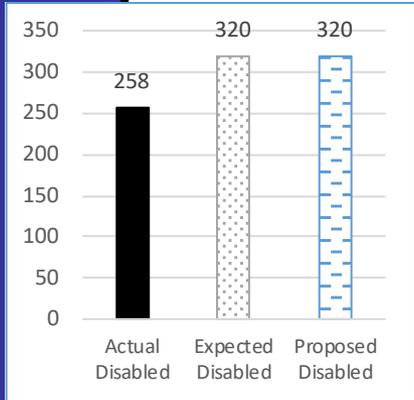




Disability Rates VaLORS Females



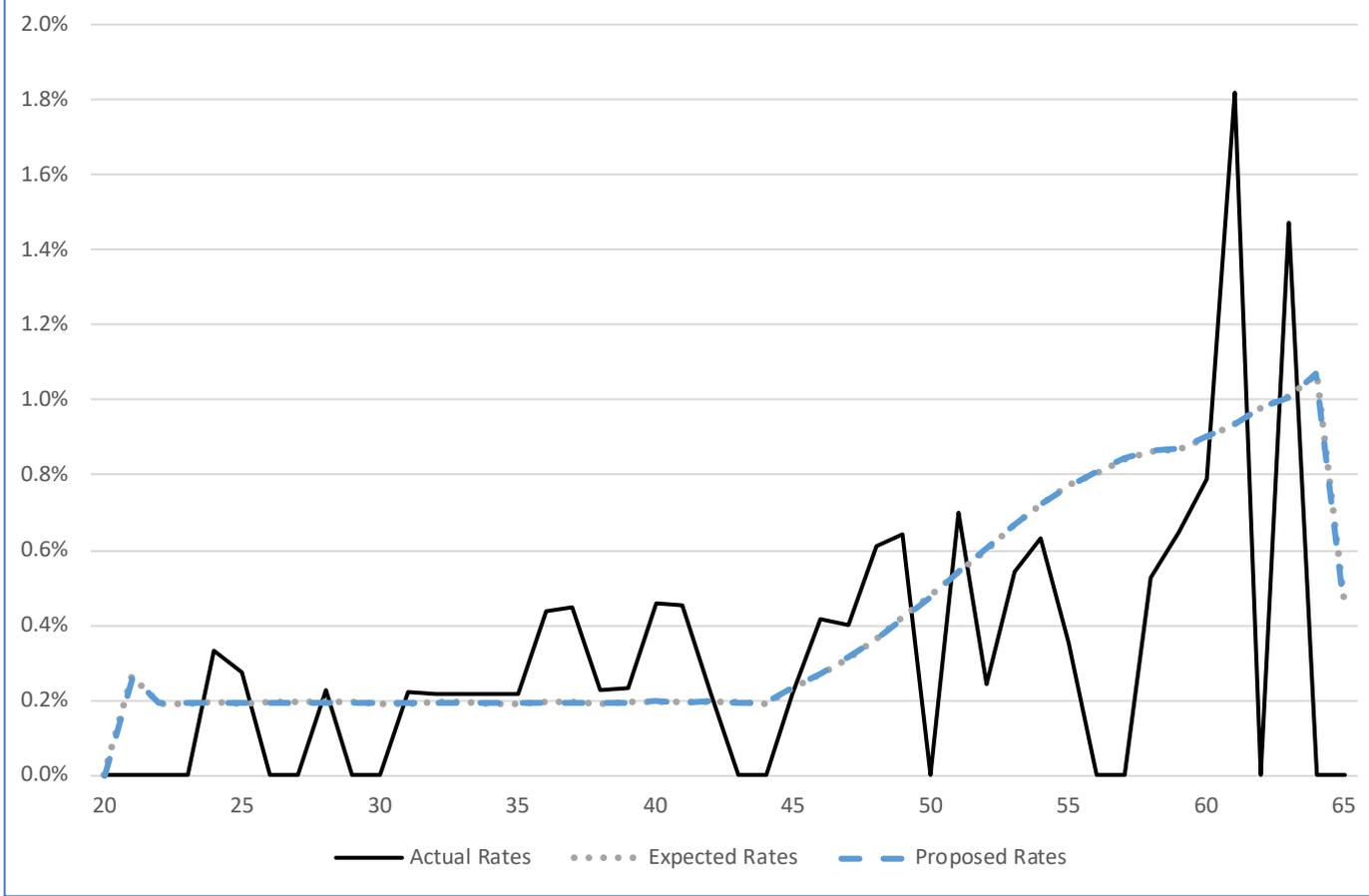
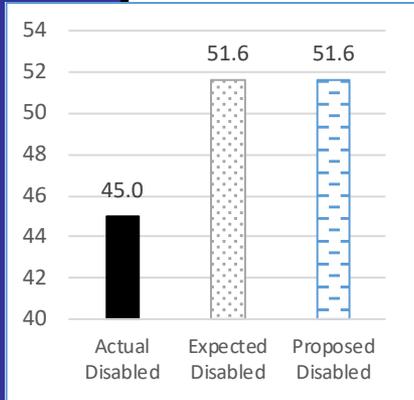
Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.





Disability Rates SPORS Males and Females

Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.



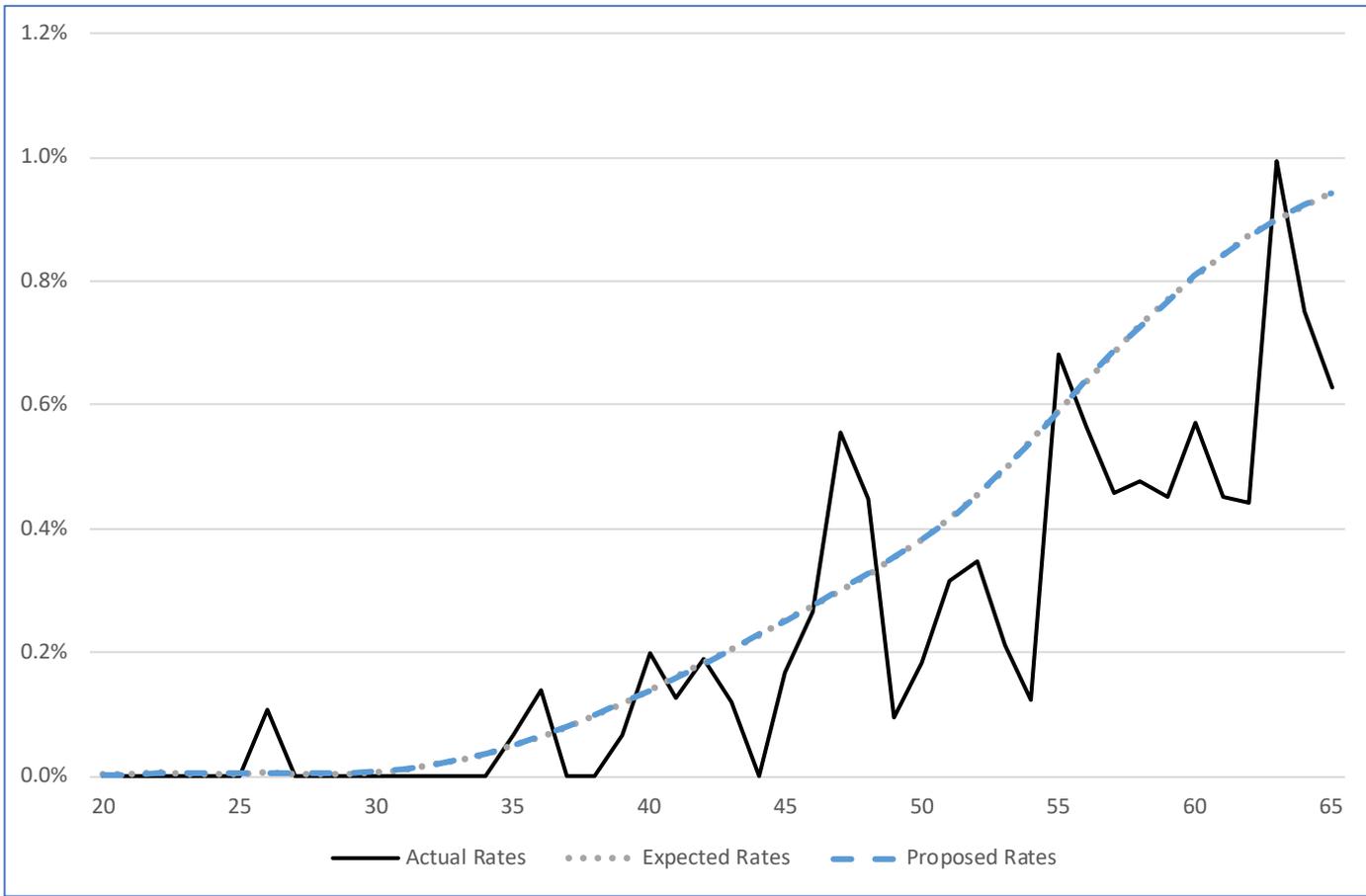
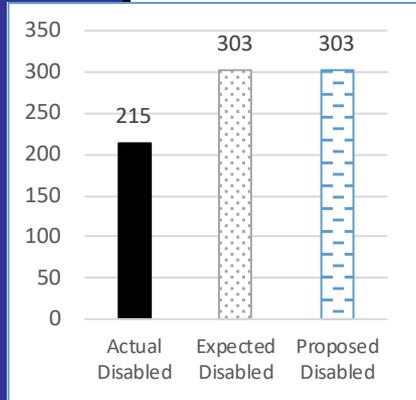


Disability Rates

Top 10 Non Hazardous Duty Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

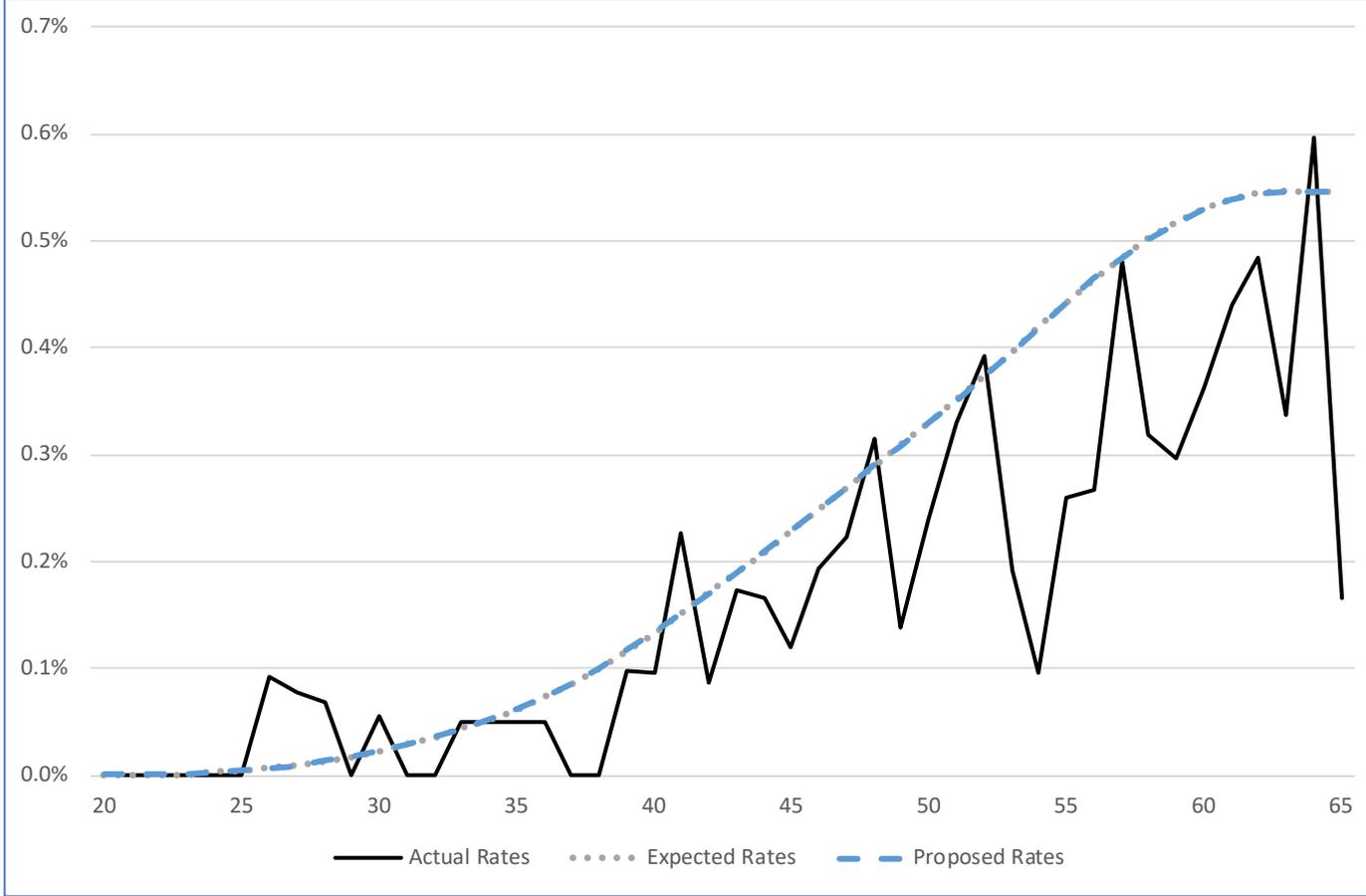
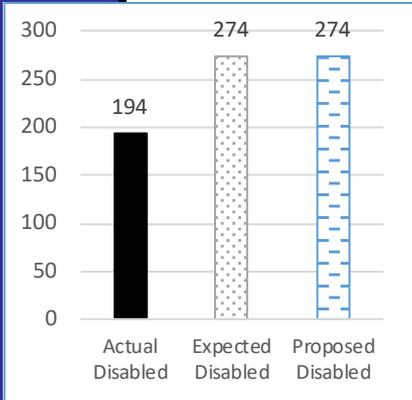




Disability Rates Top 10 Non Hazardous Duty Females



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

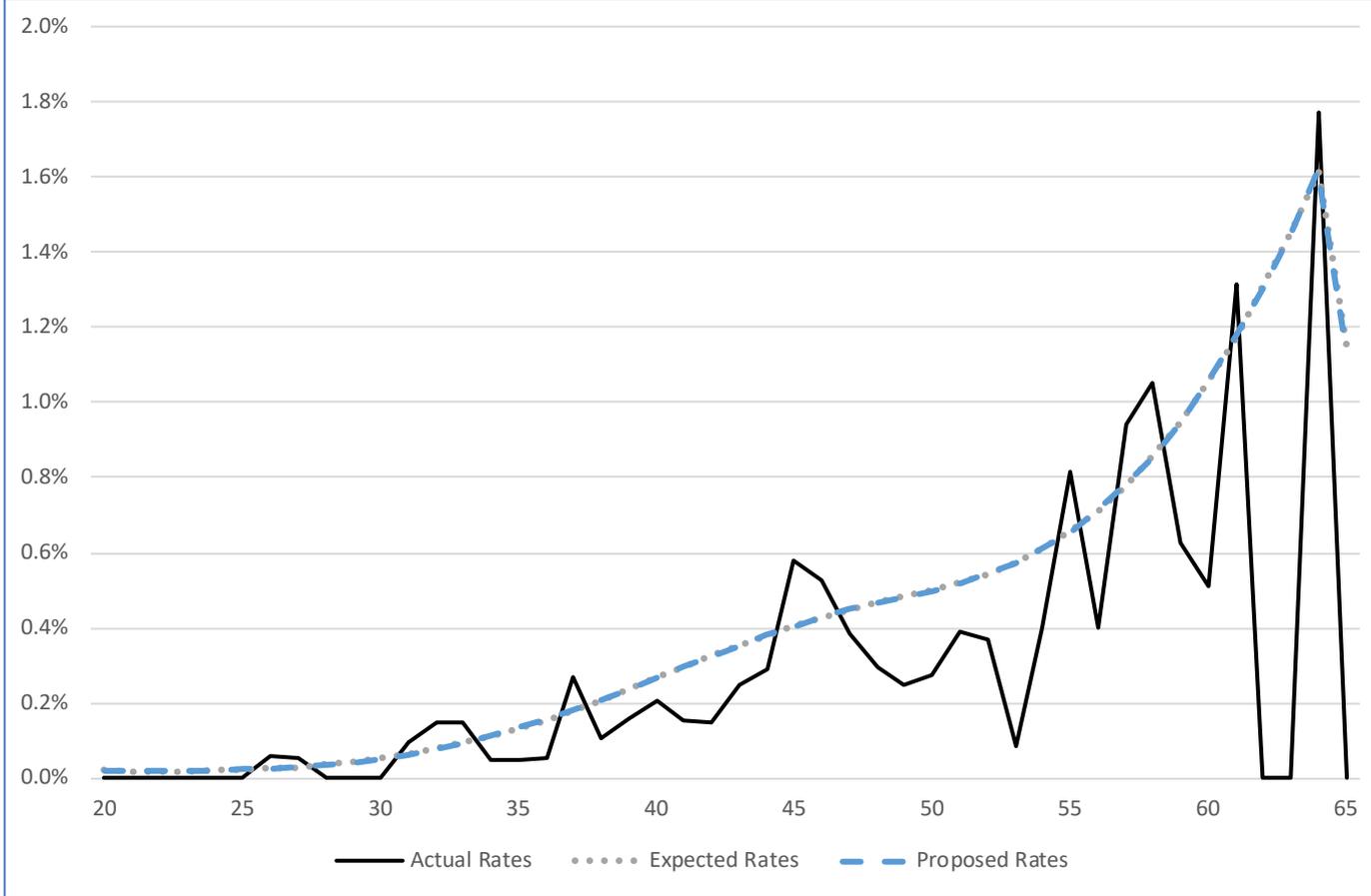
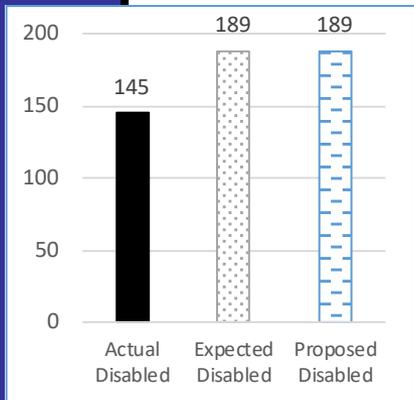




Disability Rates Top 10 Hazardous Duty Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.

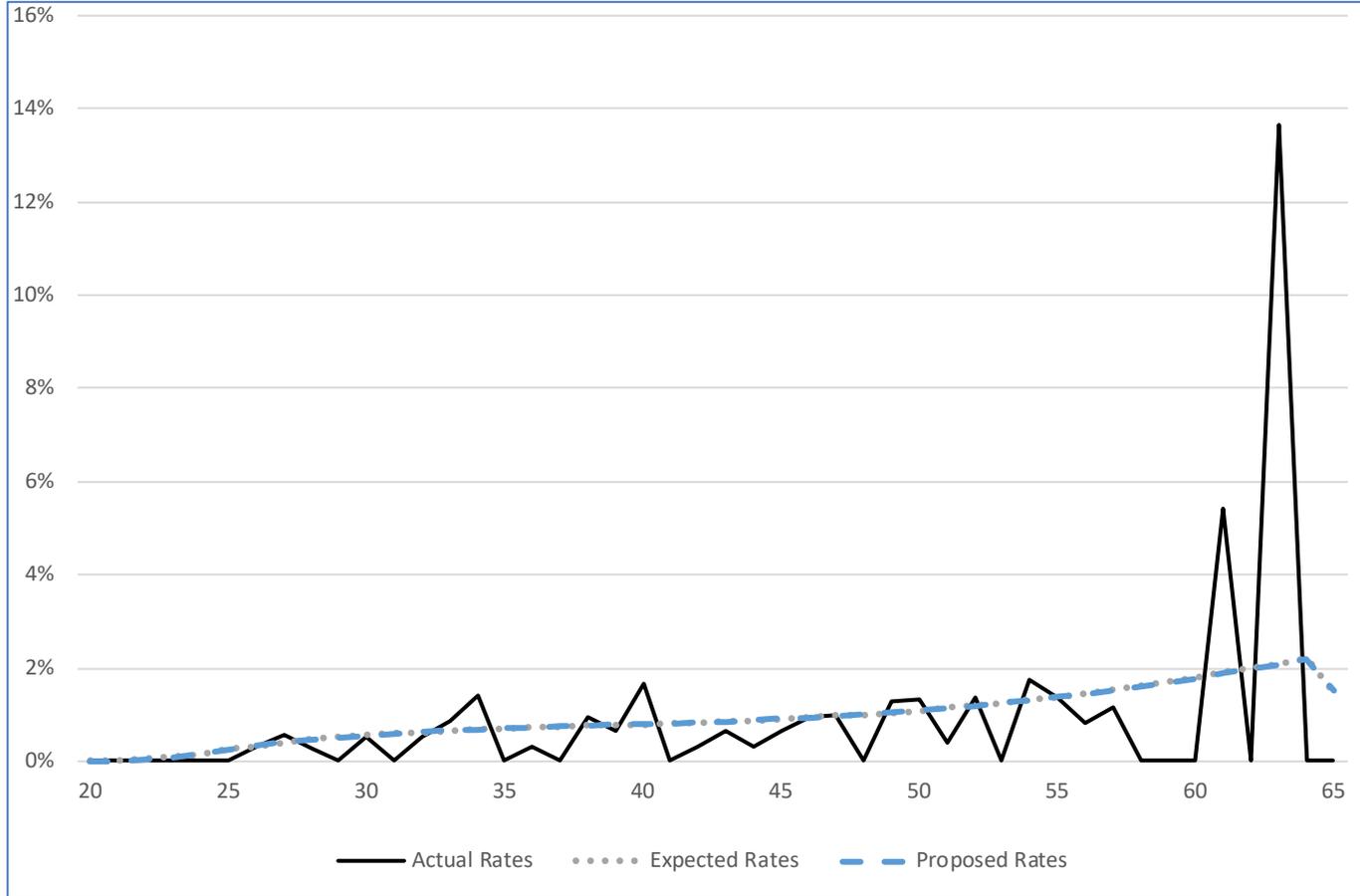
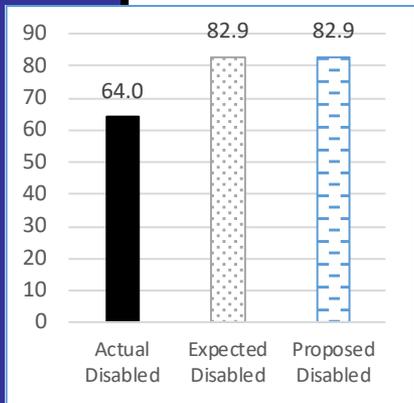




Disability Rates Top 10 Hazardous Duty Females



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.



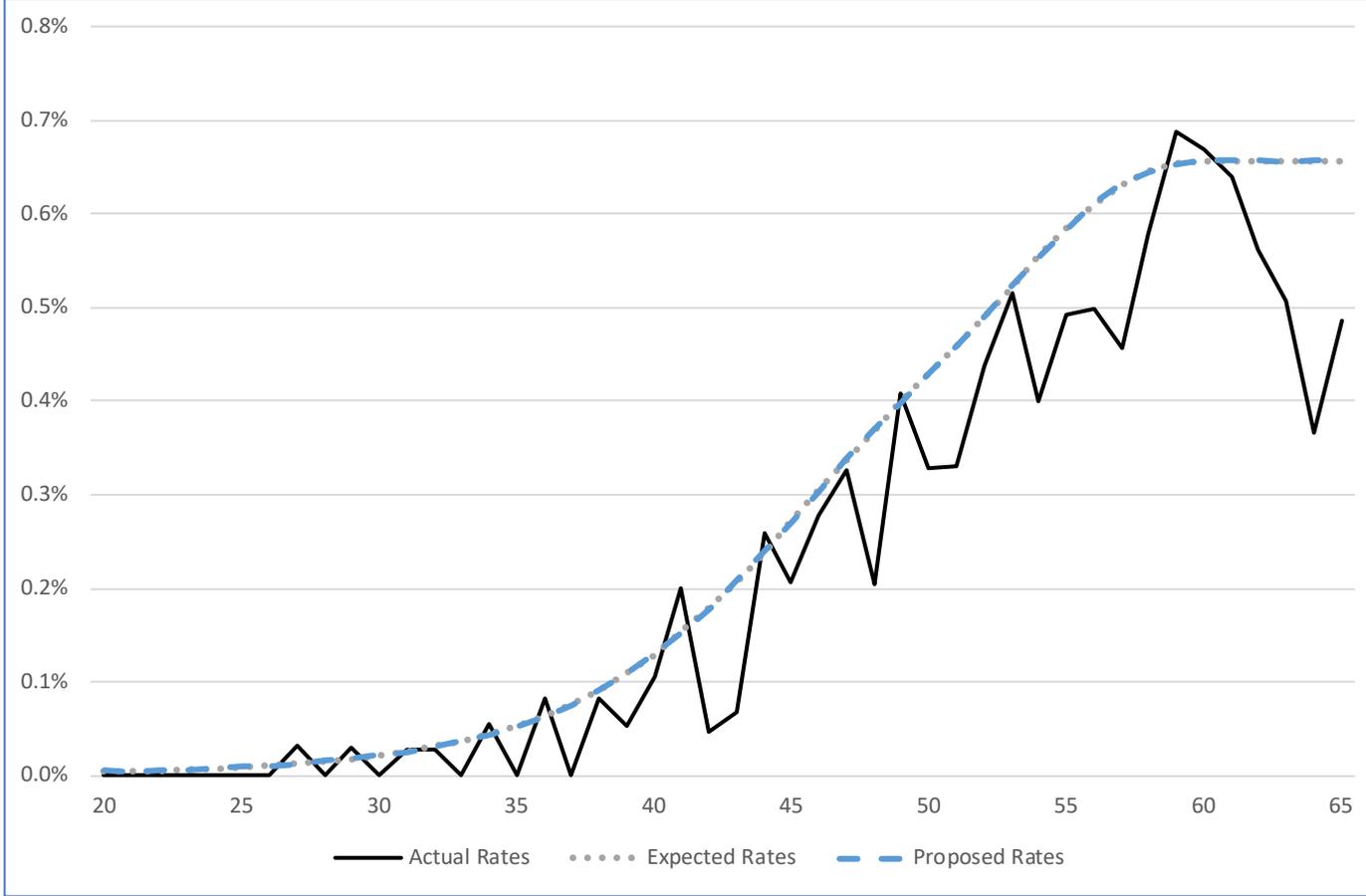
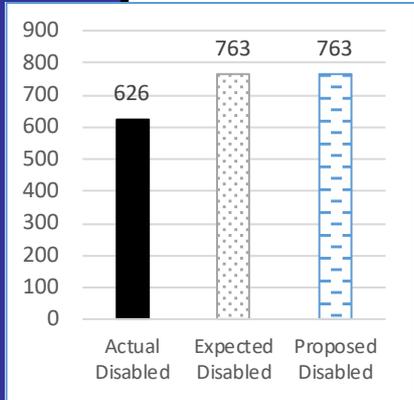


Disability Rates

Non Top 10 Non Hazardous Duty Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.



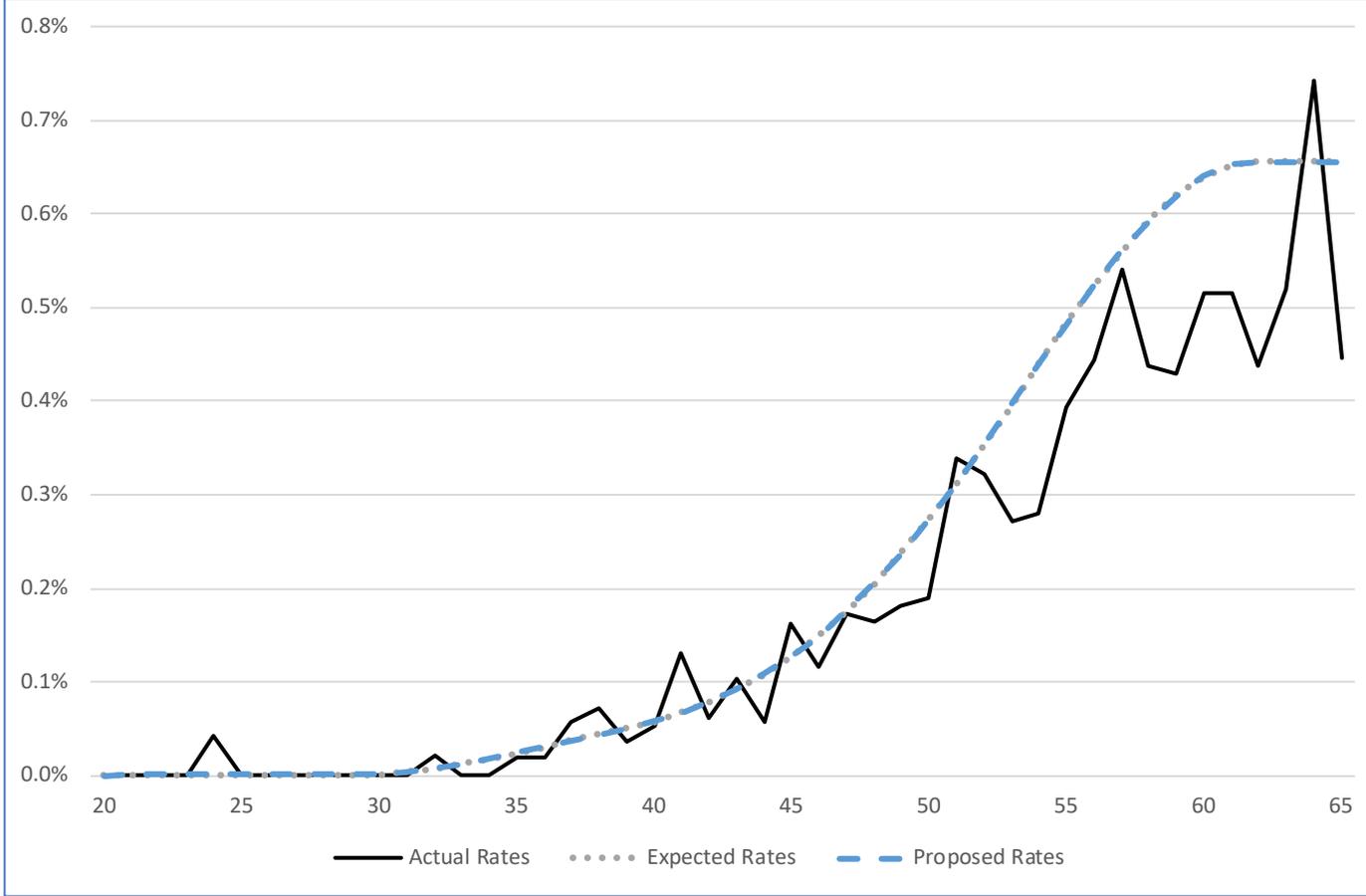
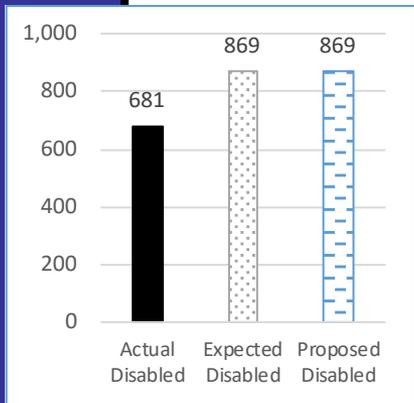


Disability Rates

Non Top 10 Non Hazardous Duty Females



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.



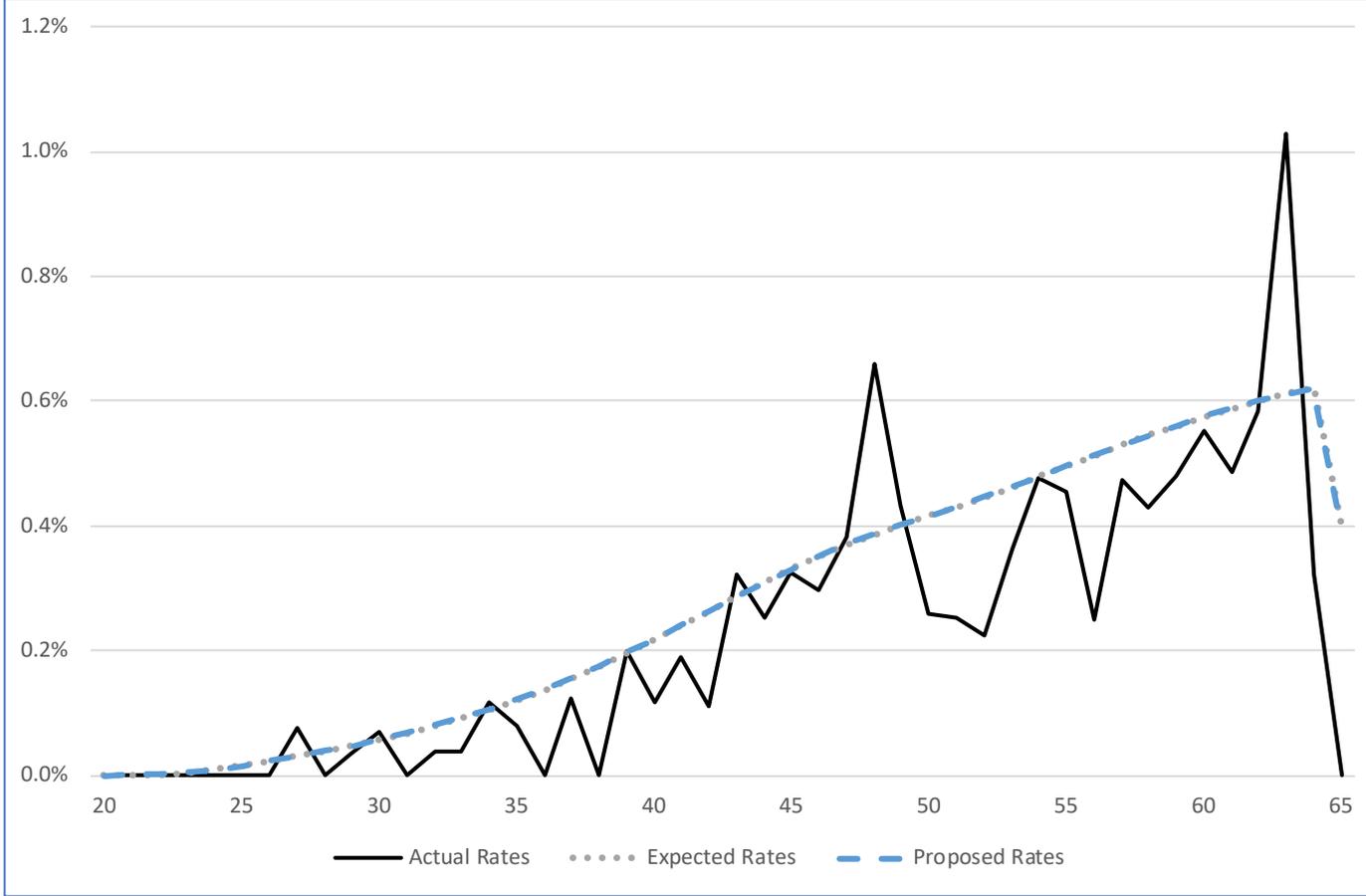
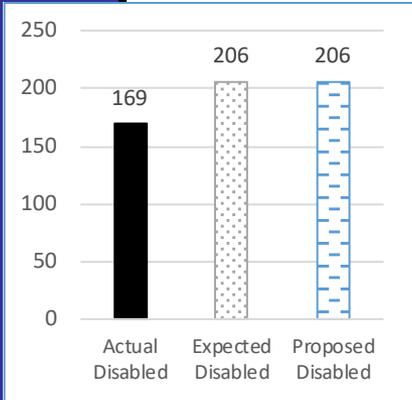


Disability Rates

Non Top 10 Hazardous Duty Males



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.



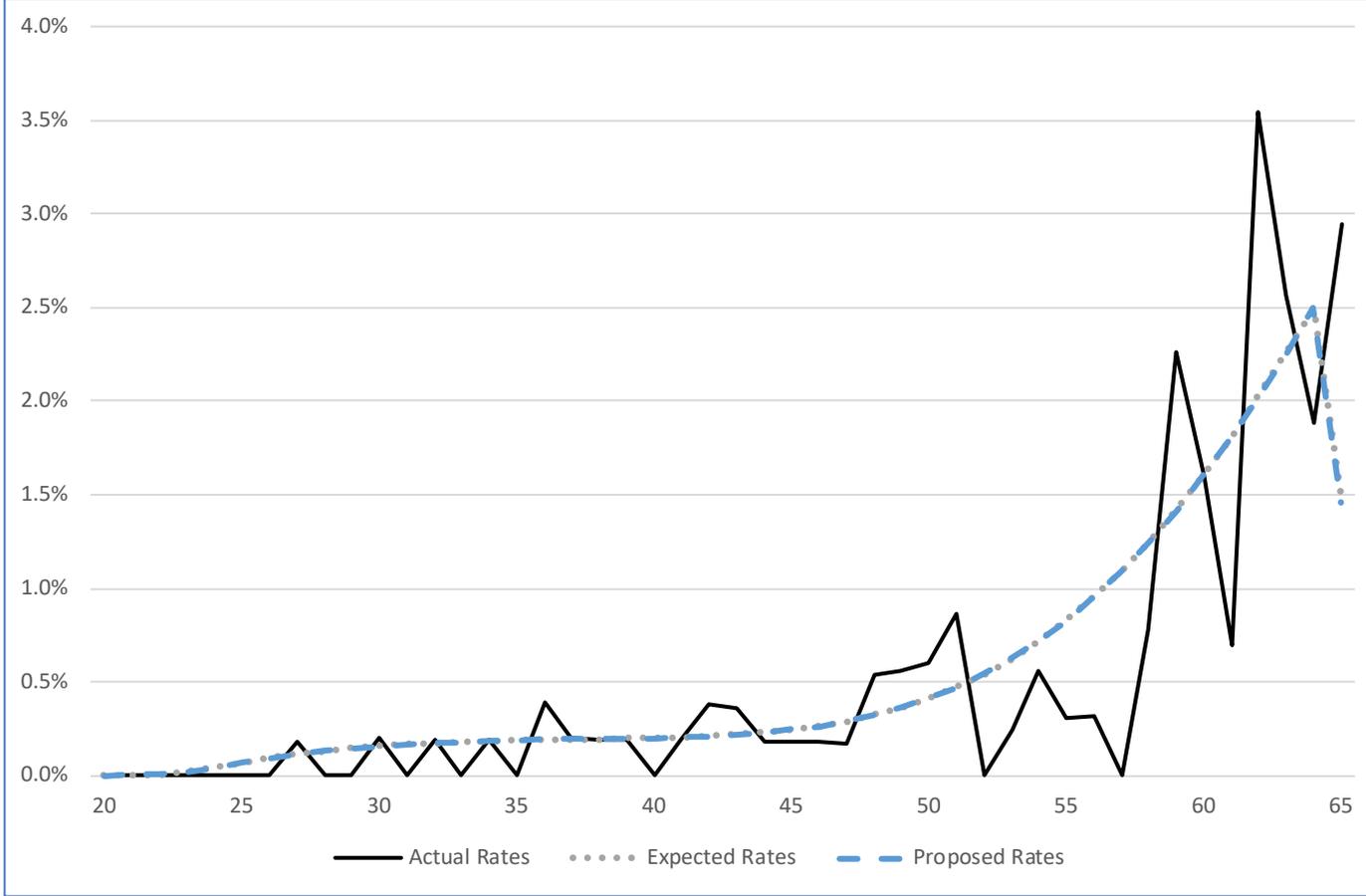
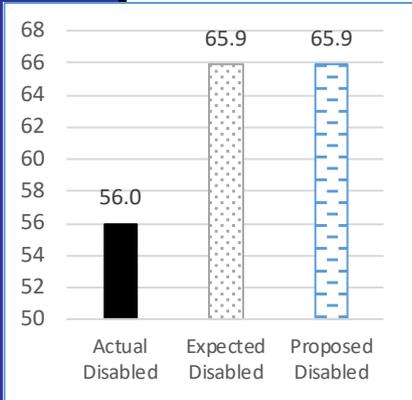


Disability Rates

Non Top 10 Hazardous Duty Females



Comment: Since disability incidence is a low frequency event, the number of disabilities in each age and gender band studied is small. Therefore we used data from the prior experience review as well as the current experience period. The current rates are still a good match to experience and we recommend retaining these rates. We prefer maintaining a margin in the rates since the number of incidences are small, but the liability associated with an occurrence can be large.





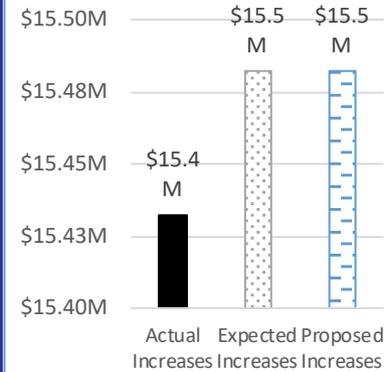
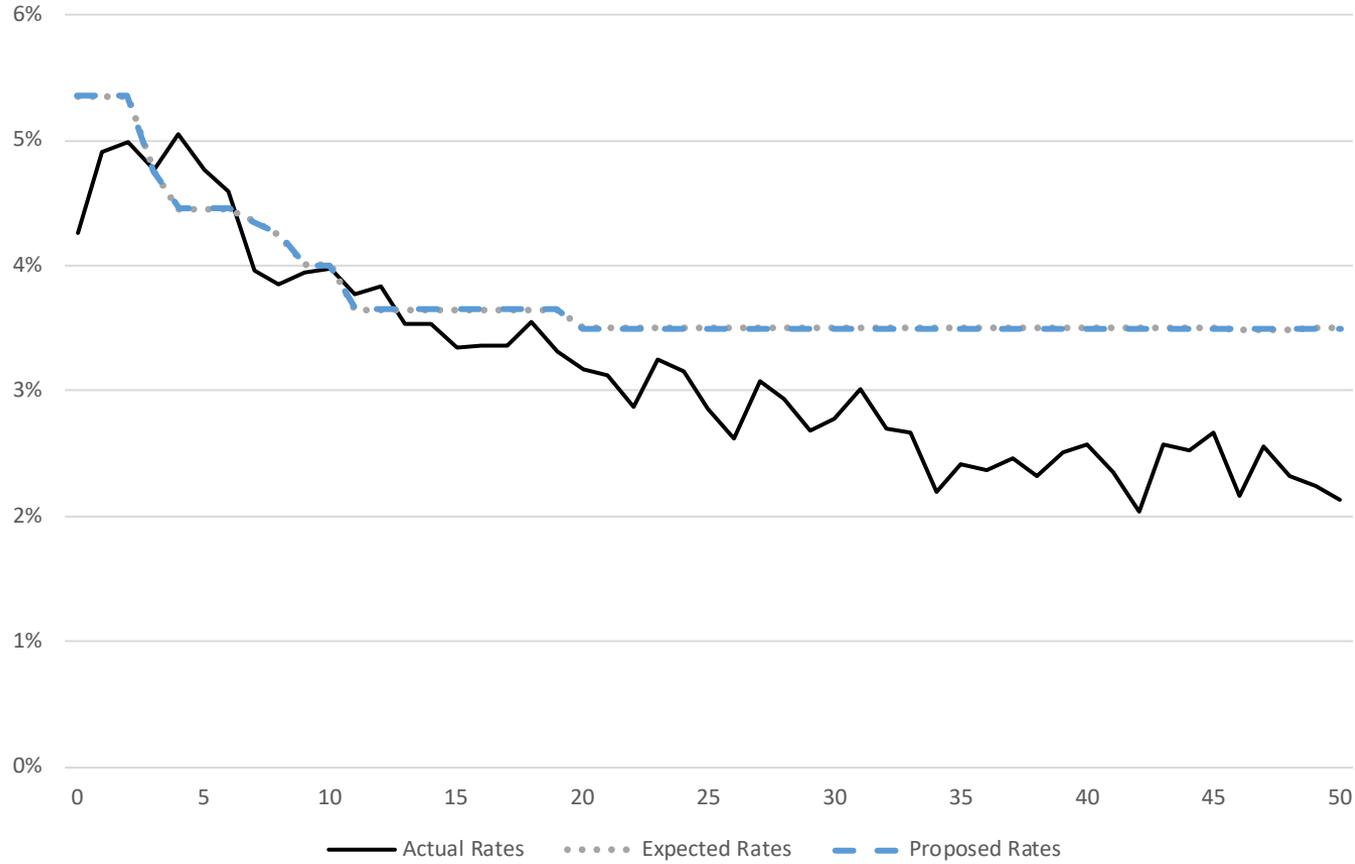
Service Related Salary Increases

State

Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.





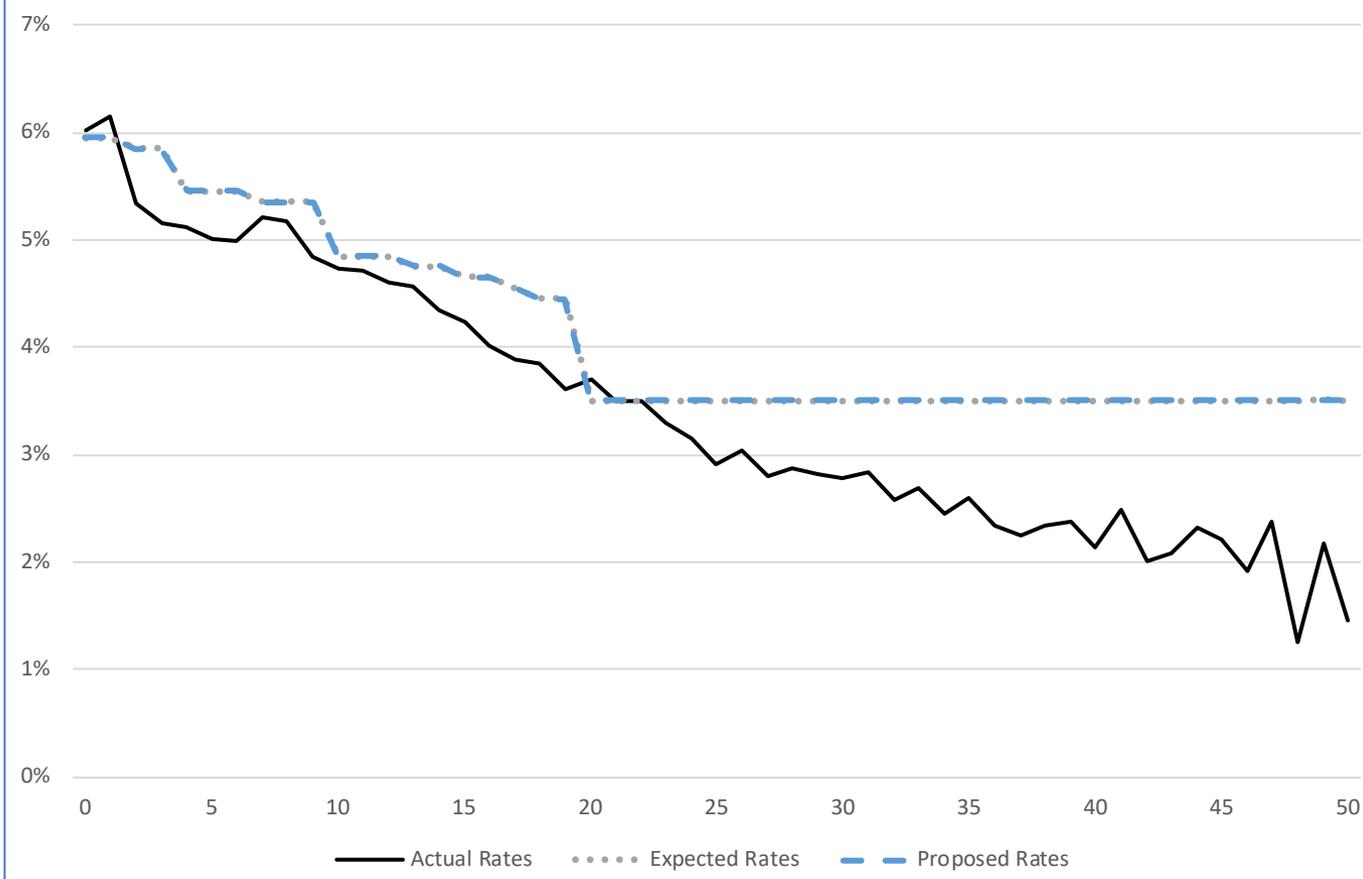
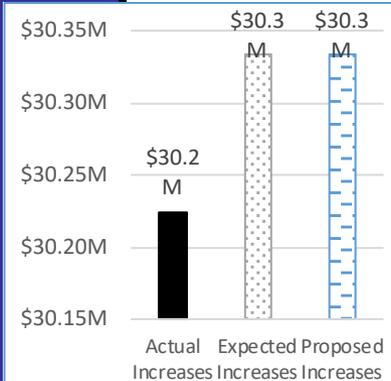
Service Related Salary Increases

Teachers

Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.





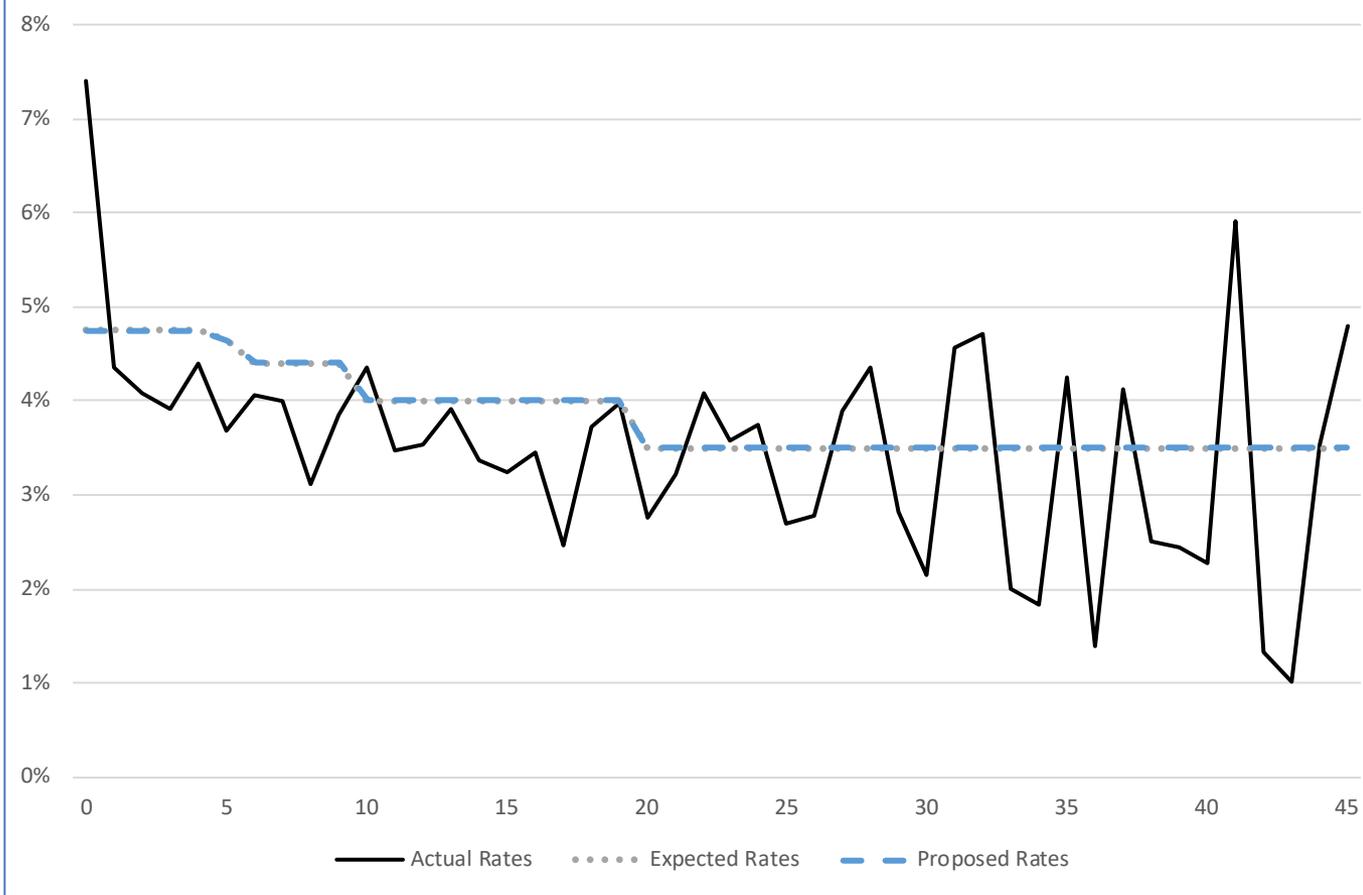
Service Related Salary Increases

VaLORS

Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.





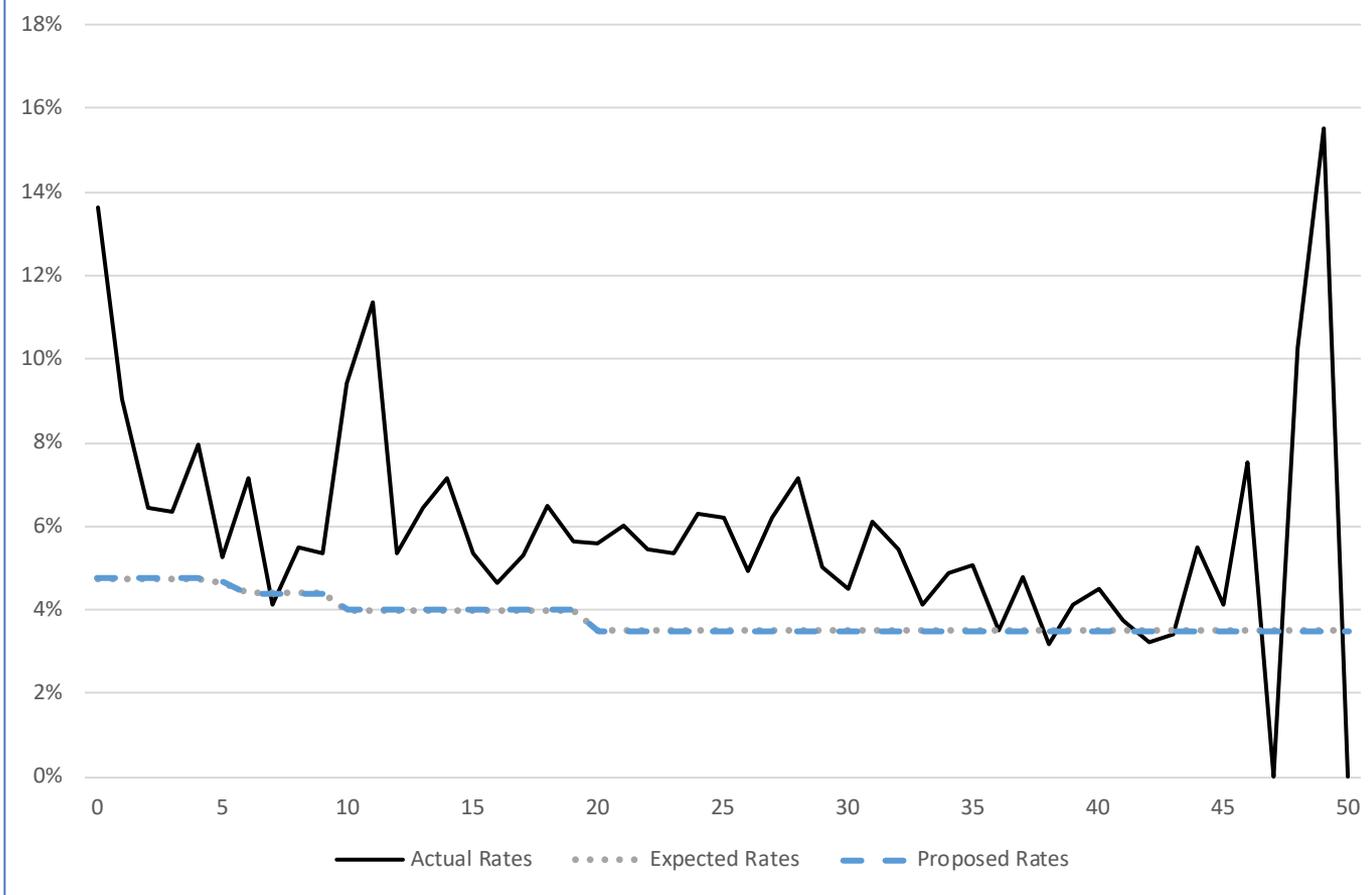
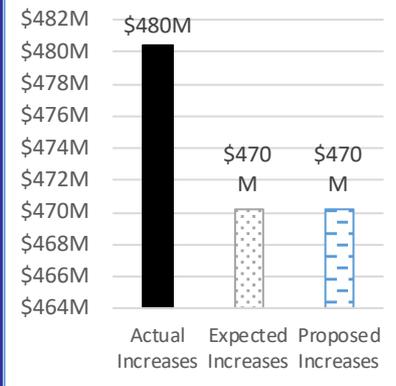
Service Related Salary Increases

SPORS

Males and Females



Comment: There was a large increase in 2018 (16%) that was a one-time occurrence. If we remove that year from the analysis, current rates are still a good match. We recommend no change.





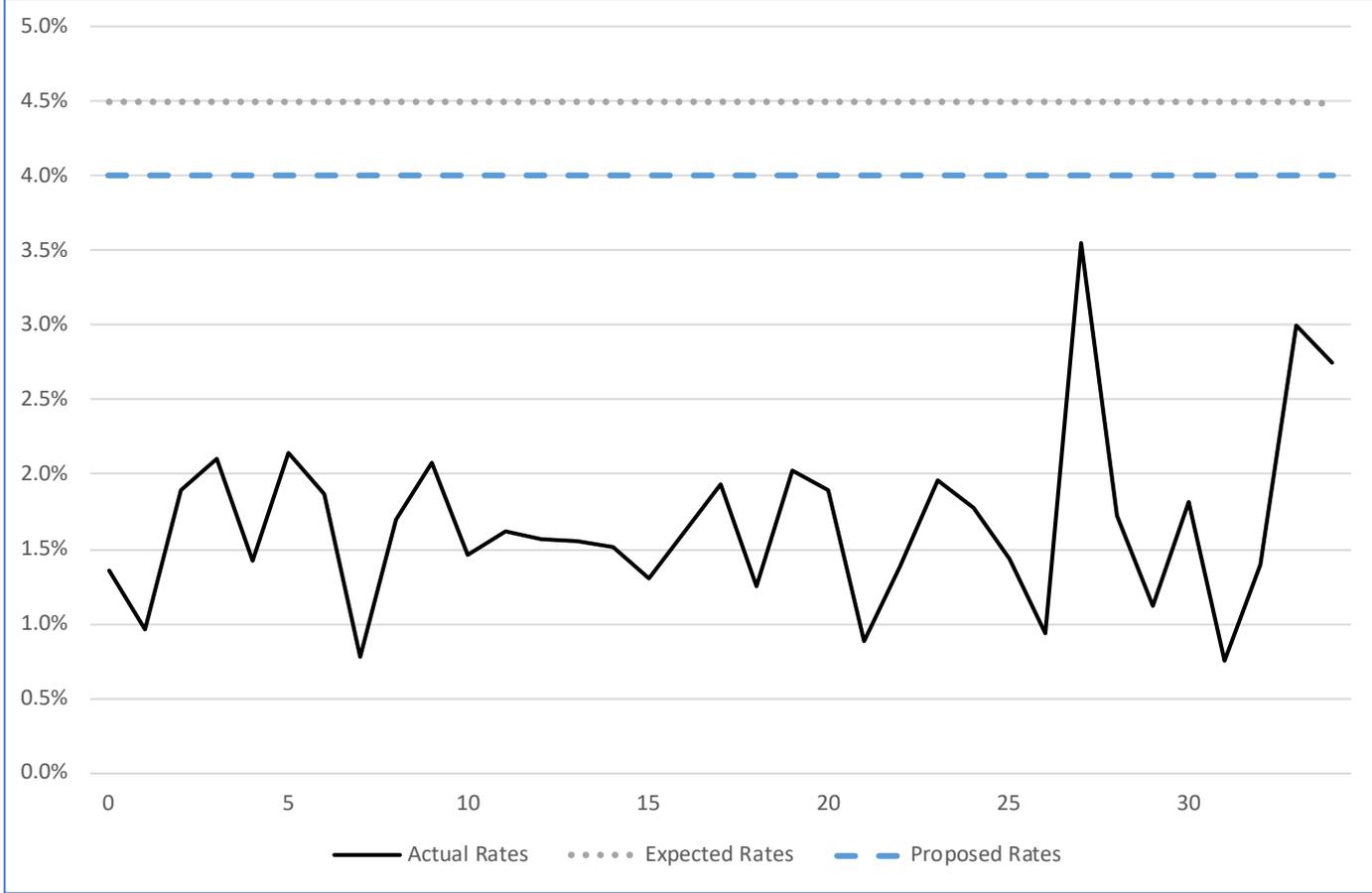
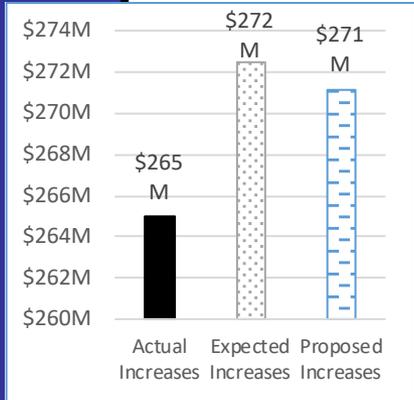
Service Related Salary Increases

JRS

Males and Females



Comment: Because actual salary increases were lower than assumed we recommend lowering the rates from 4.5% to 4.0% for all years of service.





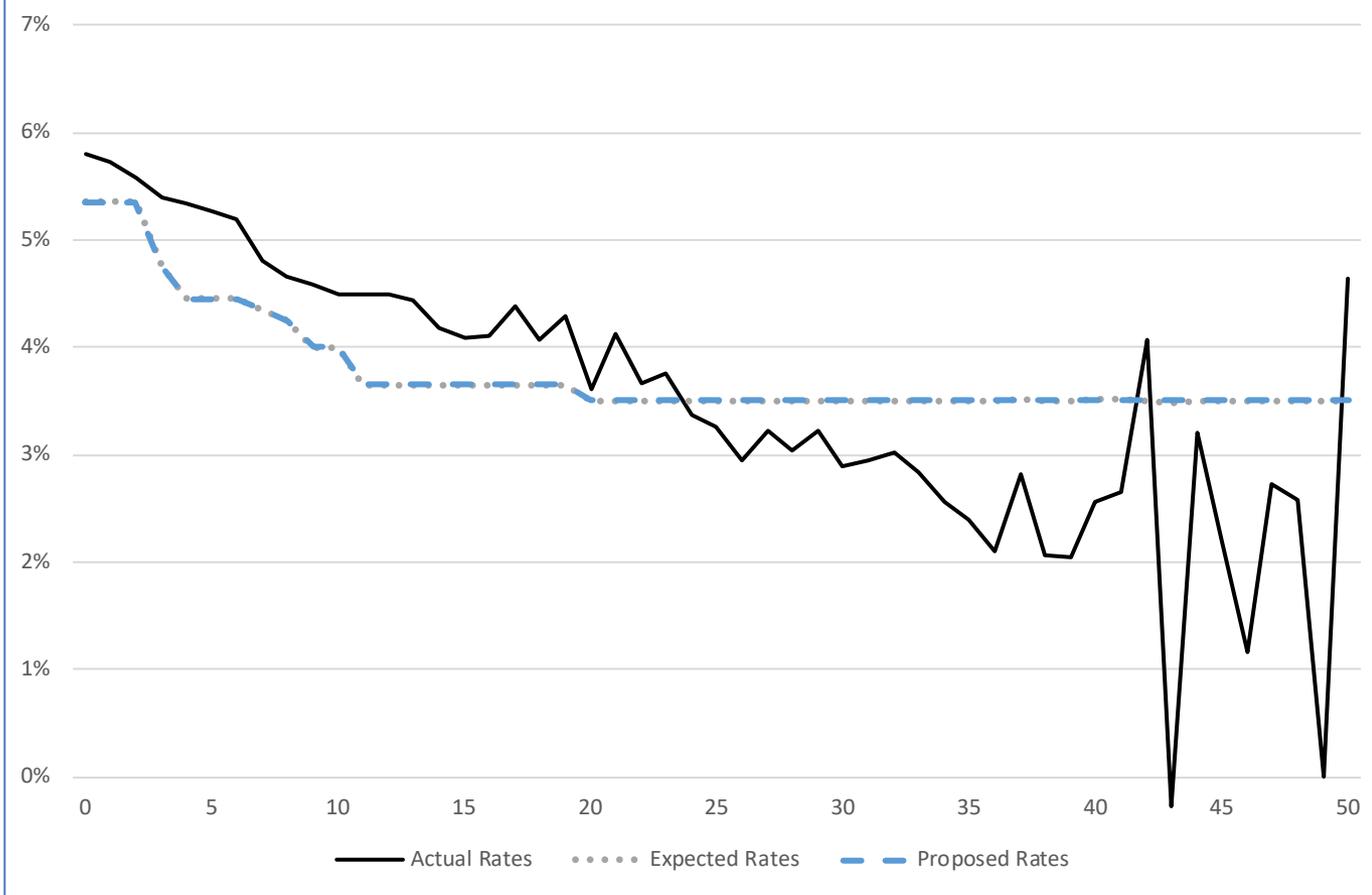
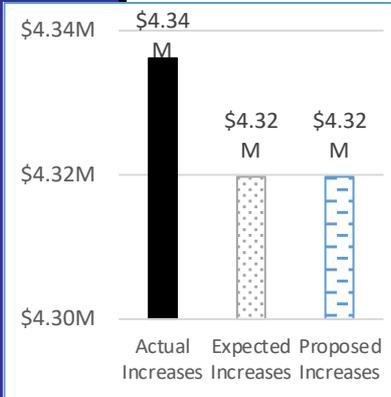
Service Related Salary Increases

Top 10 Non Hazardous Duty

Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.





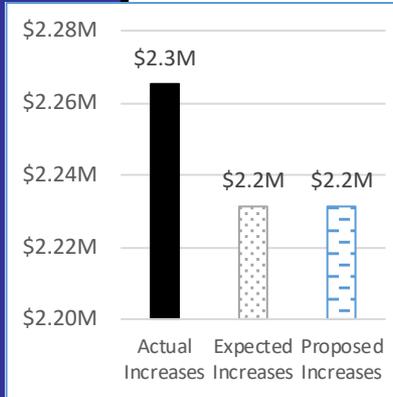
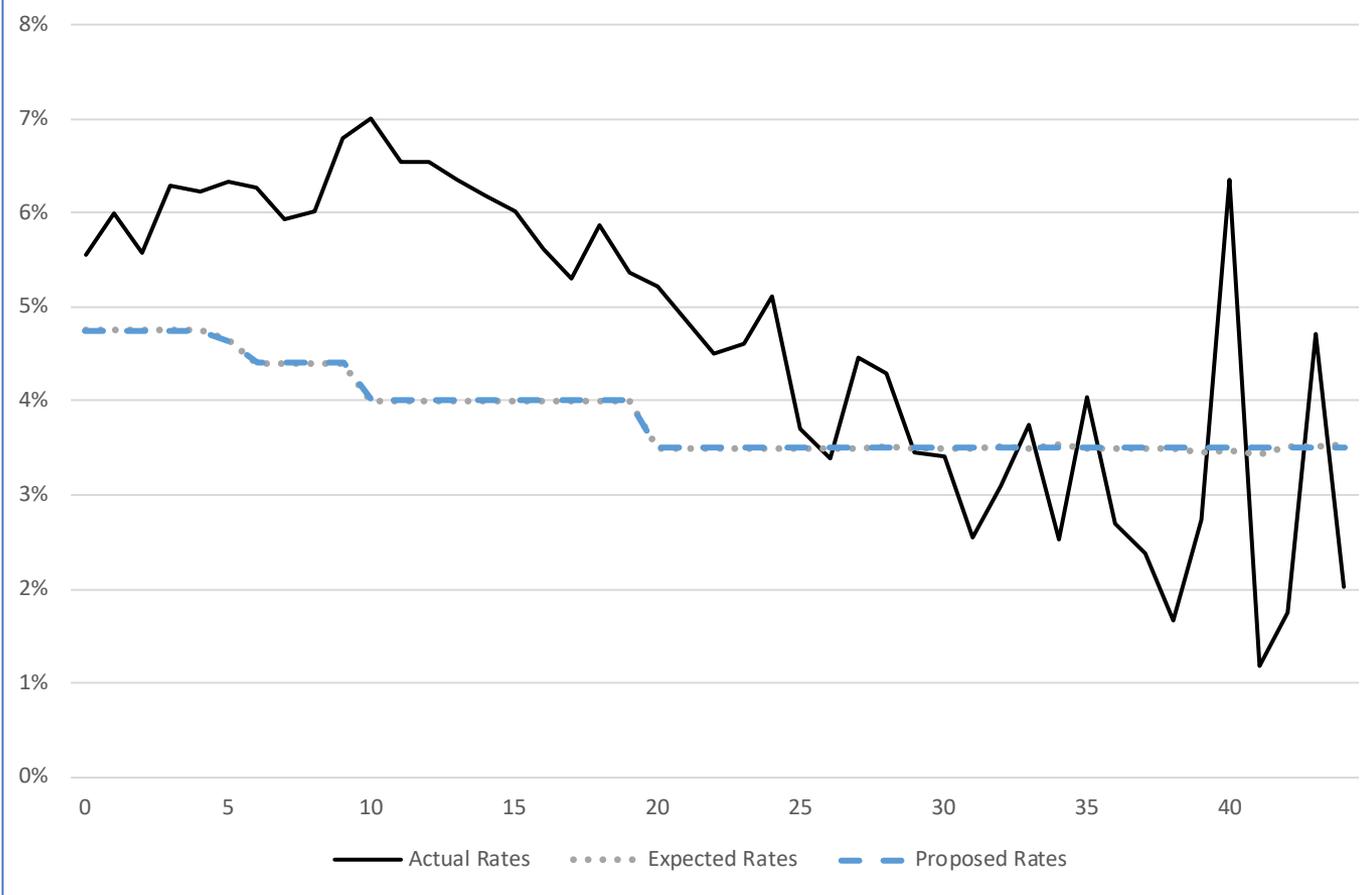
Service Related Salary Increases

Top 10 Hazardous Duty

Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.

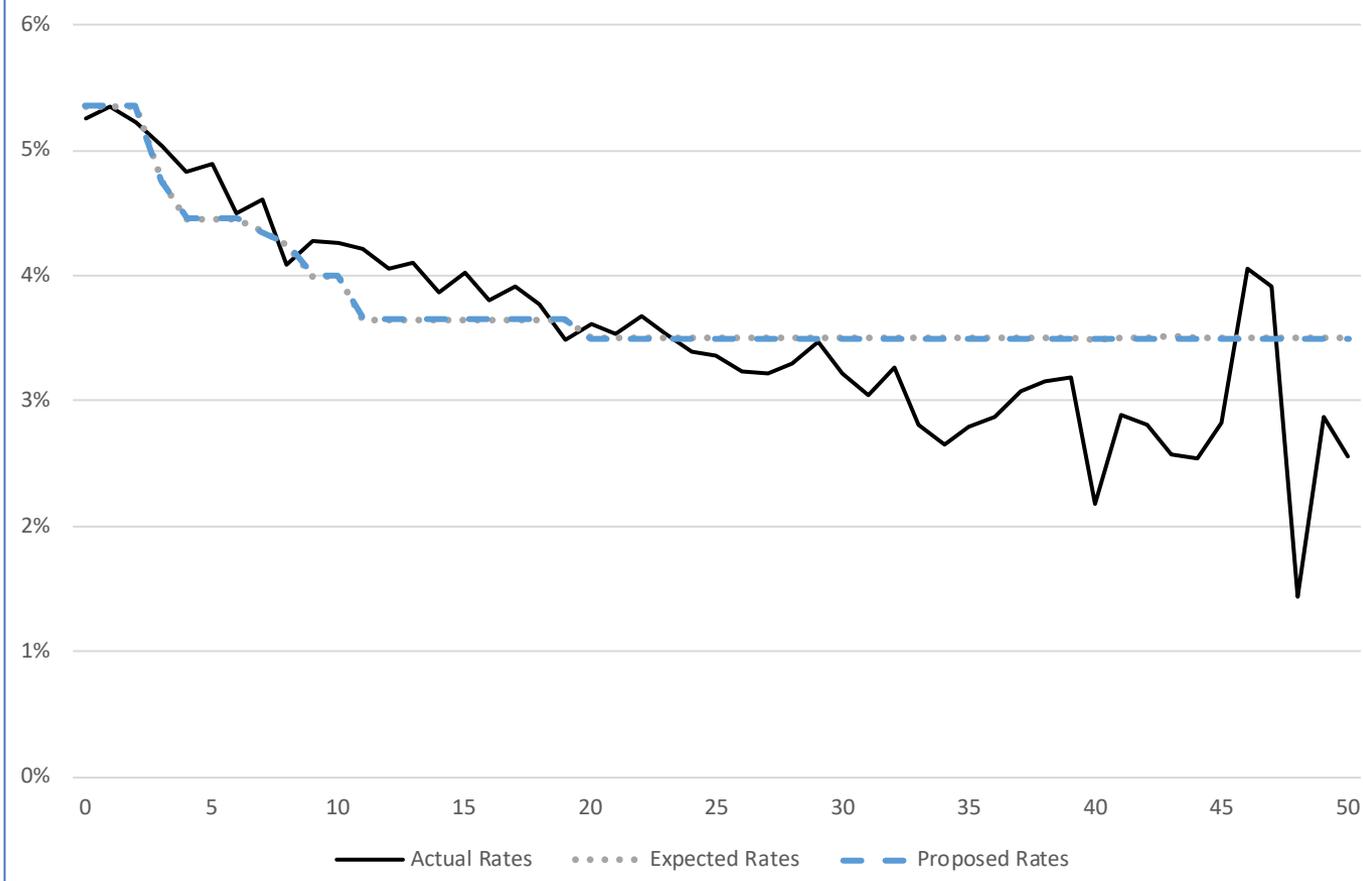
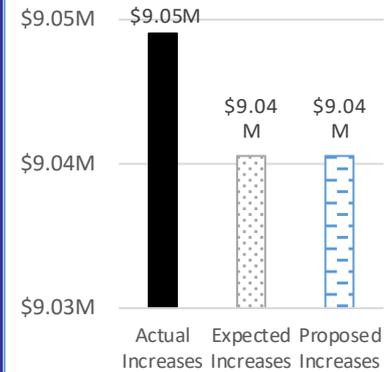




Service Related Salary Increases Non Top 10 Non Hazardous Duty Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.

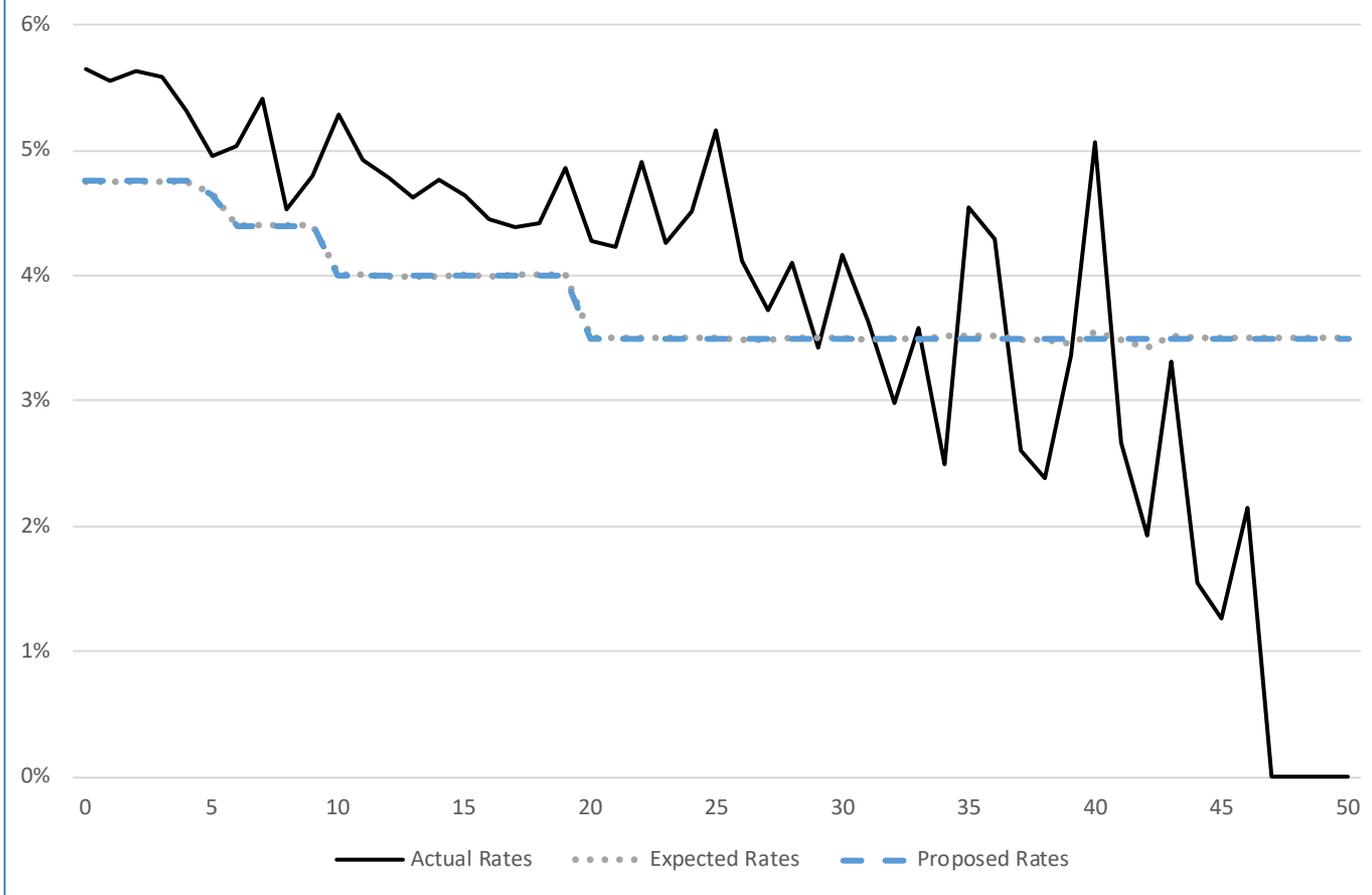
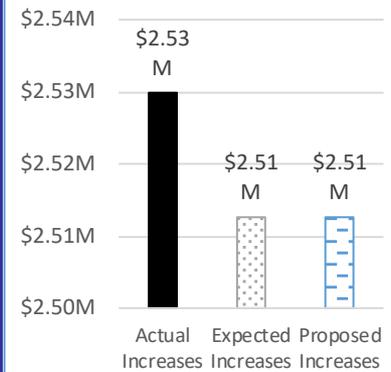




Service Related Salary Increases Non Top 10 Hazardous Duty Males and Females



Comment: Current rates are still a good match to experience. We recommend no change.





LODA Fund – Qualifying Deaths and Disabilities



- Recommend increasing assumption for most groups to reflect recent experience and/or incorporation with pension assumptions when experience is limited. Includes margin for current and future presumptions to be added as well as any future COVID-19 impact on disabilities.

LODA Fund Qualifying Disability %s

Group	Current	Proposed
State	10%	25%
SPORS	70%	85%
VaLORS	10%	35%
Non Top 10 LEOs	65%	65%
Top 10 LEOs	70%	70%

LODA Fund Qualifying Death %s

Group	Current	Proposed
State	20%	25%
SPORS	50%	85%
VaLORS	20%	35%
Non Top 10 LEOs	20%	45%
Top 10 LEOs	35%	70%



LODA Fund – Death Benefits



- LODA Fund provides a death benefit
 - \$100,000 for death occurring as a direct or proximate result of duties
 - \$25,000 for death by presumptive cause

- Current assumption is 42% of death benefit payments are paid as a direct or proximate result of the performance of duty

- Recommend changing assumption to 50% based on recent experience



LODA Fund – Spouse Participation Rates



- LODA provides dependents (e.g., spouses and eligible children) health care benefits
 - Disability
 - Death

- Current assumption is 80% of disabilities and 67% of deaths result in spouse coverage

- Recommend 80% of disabilities and 80% of deaths result in spouse coverage based on recent experience



LODA Fund – Spouse Age Difference and Member Medicare Eligibility



- Spouse Age Difference
 - Current assumption for spouse age difference is husbands are 3 years older than wives
 - Recommend retaining this assumption

- Member Medicare Eligibility – members who become eligible for benefits after June 30, 2017
 - 80% of disabled employees are assumed to be eligible for Medicare due to age (age 65) and 20% are assumed to become eligible for Medicare earlier than age 65 due to disability
 - Recommend changing to 75% eligible for Medicare due to age (age 65) and 25% are assumed to become eligible for Medicare earlier than age 65 due to disability



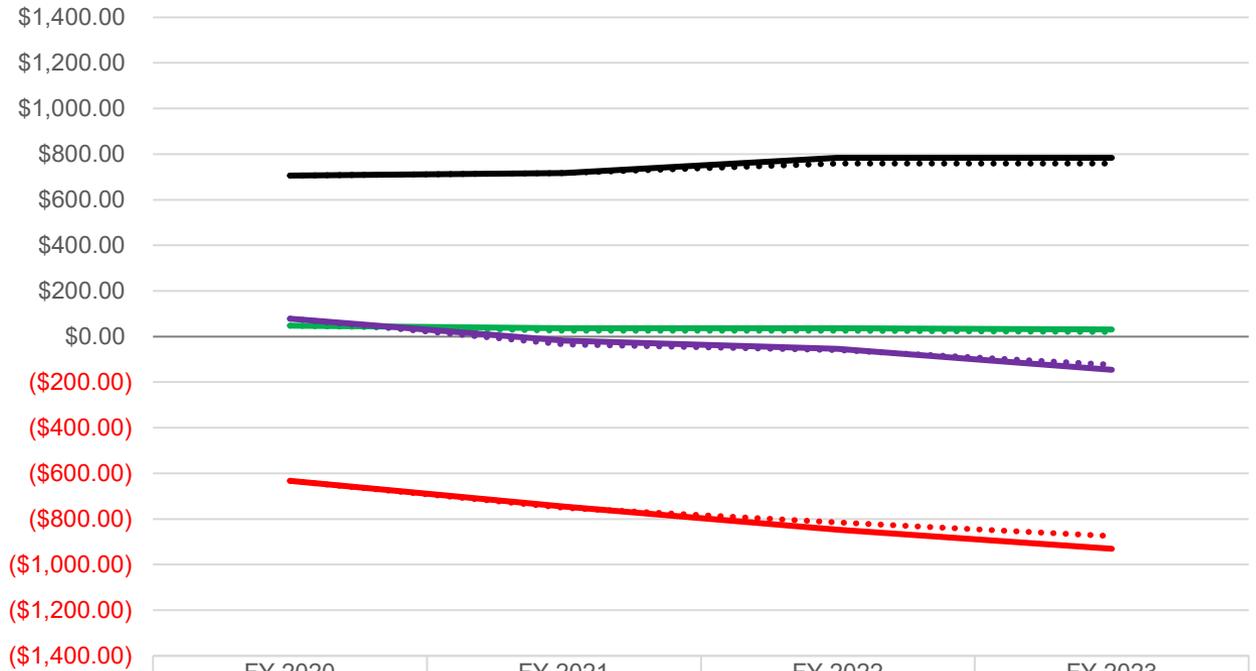
LODA Fund – Health Care Cost Inflation



- LODA provides health care benefits whose cost increases at an assumed rate of health care inflation (trend)
- Initial trend based upon meta-analysis and graded down to an ultimate rate 4.75%.
- We recommend using the same methodology for initial trend and grading down to an ultimate rate of inflation + 2%, or 4.50%.
- Trend assumption varies by age
 - Under age 65 (not eligible for Medicare)
 - Ages 65 and older (eligible for Medicare)
- Trend assumption reviewed annually



LODA Fund – Cash Flow Projection Comparison



	FY 2020	FY 2021	FY 2022	FY 2023
— Employer Contribution Rate (ES)	\$705.77	\$717.31	\$783.14	\$783.14
..... Employer Contribution Rate	\$705.77	\$717.31	\$758.03	\$758.03
— Benefit Costs (ES)	(633.52)	(745.77)	(846.97)	(931.31)
..... Benefit Costs	(633.52)	(751.44)	(814.84)	(874.45)
— Investment Income and Misc Rev (ES)	48.22	37.00	36.82	30.32
..... Investment Income and Misc Rev	48.22	25.90	24.69	20.45
— Net Cash Flow (ES)	78.38	(17.47)	(53.82)	(145.47)
..... Net Cash Flow	78.38	(34.24)	(58.93)	(123.59)



HIC State & Teachers Benefit Election



➤ Current & Proposed assumption

- Eligible future service retirees from active status
 - All Classes - 95%
 - Experience indicates that the 95% election for eligible future service retirees from active status is appropriate

- Eligible future disabled members

System	Current Assumption	Proposed Assumption
State/JRS	95%	95%
Teachers	90%	90%
SPORS/VaLORS	75%	80%

- Eligible future service retirees from terminated vested status

Current Assumption								
System	Year of Retirement							
	1	2	3	4	5	6	7	8+
State/JRS, Teachers, and SPORS/VaLORS	55%	65%	70%	75%	80%	85%	90%	95%

- Experience indicates a 95% assumption for all years for eligible future service retirees from terminated vested status is appropriate



HIC State & Teachers Benefit Utilization



- Not all eligible retirees and disabled members electing HIC benefits receive the maximum HIC benefit for which they are eligible

- Utilization comprised of three basic components:
 - Percentage of members electing HIC benefits, but not receiving the full amount
 - Percentage of full benefit received, if not receiving the full amount
 - Increase in benefit over time, if not receiving the full benefit



HIC State & Teachers Benefit Utilization



- Experience indicates that the assumption for members receiving less than the full benefit for which they are eligible should be reduced

System	Current Assumption	Proposed Assumption
State/JRS	10%	5%
Teachers	20%	15%
SPORS/VaLORS	20%	10%

- Current assumption members who are assumed to utilize less than the full benefit are assumed to utilize 70% of the maximum benefit
 - Experience indicates that the 70% is still appropriate



HIC State & Teachers Benefit Utilization



- Experience indicates that for the first year of retirement, those service retirees and disabled members receiving less than the full benefit for which they are eligible will, on average, have an increase in their HIC benefit amount by 4.50%

Current Increase Assumptions				
System	Year of Retirement			
	1	2	3	4+
All VRS Systems	6.50%	4.25%	4.25%	3.00%

Proposed Increase Assumptions				
System	Year of Retirement			
	1	2	3	4+
All VRS Systems	4.50%	4.25%	4.25%	3.00%



HIC State & Teachers Terminated Vested Withdrawals



- Vested members who terminate employment prior to being eligible for retirement may withdraw their contributions with VRS
 - No longer eligible to receive HIC benefits
- Experience indicates future vested members who terminate employment prior to being eligible for retirement who are assumed to keep their contributions with VRS should be split by over and under age 50

System	Age	Current Assumption	Proposed Assumption
State/JRS	Under Age 50	50%	75%
	Over Age 50		35%
Teachers	Under Age 50	35%	75%
	Over Age 50		35%
SPORS/VaLORS	Under Age 50	70%	90%
	Over Age 50		55%



HIC State & Teachers Term Vested Retirement Age



- Vested members who terminate employment prior to being eligible for retirement may elect to leave their contributions with VRS and receive a pension benefit when eligible
 - If eligible, may elect to receive HIC benefits when retired
- Experience indicates that assumed retirement age of new service retirees from terminated vested status eligible for HIC benefits is appropriate as follows:

System	Current Assumption
State/JRS	60*
Teachers	60*
SPORS/VaLORS	
Less than 25 years of service	55
25 or more years of service	50



HIC Locals & Special Coverage Codes Benefit Election



➤ Current & Proposed assumption

- Eligible future service retirees from active status
 - All Classes - 85%
 - Experience indicates that the 85% election for eligible future service retirees from active status is appropriate
- Eligible future disabled members
 - All Classes - 45%
 - Experience indicates that the 50% election for eligible future service retirees from active status is appropriate
- Eligible future service retirees from terminated vested status

Current Assumption								
System	Year of Retirement							
	1	2	3	4	5	6	7	8+
State/JRS, Teachers, and SPORS/VaLORS	55%	65%	70%	75%	80%	85%	90%	95%

- Experience indicates a 85% assumption for all years for eligible future service retirees from terminated vested status is appropriate



HIC Locals & Special Coverage Codes Benefit Utilization



- Experience indicates that the assumption for members receiving less than the full benefit for which they are eligible should be reduced
 - Current assumption for all classes: 10%
 - Proposed assumption for all classes: 5%

- Current assumption members who are assumed to utilize less than the full benefit are assumed to utilize 70% of the maximum benefit
 - Experience indicates that the 70% is still appropriate



HIC Locals and Special Coverage Codes Benefit Utilization



- Experience indicates that for the first year of retirement, those service retirees and disabled members receiving less than the full benefit for which they are eligible will, on average, have an increase in their HIC benefit amount by 4.50%

Current Increase Assumptions				
System	Year of Retirement			
	1	2	3	4+
All VRS Systems	6.50%	4.25%	4.25%	3.00%

Proposed Increase Assumptions				
System	Year of Retirement			
	1	2	3	4+
All VRS Systems	4.50%	4.25%	4.25%	3.00%



HIC Locals & Special Coverage Codes Terminated Vested Withdrawals



- Vested members who terminate employment prior to being eligible for retirement may withdraw their contributions with VRS
 - No longer eligible to receive HIC benefits
- Experience indicates future vested members who terminate employment prior to being eligible for retirement who are assumed to keep their contributions with VRS should be split by over and under age 50

System	Age	Current Assumption	Proposed Assumption
Locals	Under Age 50	45%	85%
	Over Age 50		50%



HIC Locals & Special Coverage Codes

Term Vested Retirement Age



- Vested members who terminate employment prior to being eligible for retirement may elect to leave their contributions with VRS and receive a pension benefit when eligible
 - If eligible, may elect to receive HIC benefits when retired
- Experience indicates that assumed retirement age of new service retirees from terminated vested status eligible for HIC benefits is appropriate as follows:

System	Current Assumption
Non-LEOs/Fire	60*
LEOs/Fire	
Less than 25 years of service	55
25 or more years of service	50

*Adjusted for those members eligible under Plan 2



VSDP/VLDP – Benefit Offsets

- LTD income replacement benefits are adjusted for other disability benefits paid and/or other income received
 - Reduces full LTD income replacement benefit

- Benefit offset rates for newly disabled increasing during experience period
 - Proposed rates based upon experience
 - Proposed change generally represents slight adjustments to the current assumption

- Also reviewed probability of existing beneficiaries without benefit offsets receiving them in the future and the resulting level of expected LTD benefit payment
 - Proposed change extends the period in which those without offsets are assumed to eventually receive an offset



VSDP – Benefit Offsets



- Percentage of full LTD income replacement benefit paid

Year of Long-Term Disability	Average Percentage of Full Benefit Paid	Current Assumption	Proposed Assumption
1	70.9%	72.3%	70.9%
2	56.6%	57.5%	56.6%
3	51.7%	46.5%	51.7%
4	49.1%	40.3%	49.1%
5	41.7%	36.7%	41.7%
6 – 9	35.5%	34.2%	35.5%
10 - 13	42.6%	40.4%	42.6%
14	45.1%	41.1%	45.1%
15+	50.9%	45.0%	50.9%



VSDP – Benefit Offsets

- Probability of receiving a benefit offset in the future if not currently receiving a benefit offset and the expected VSDP benefit payment amount after offset

Year of Long-Term Disability	Percentage of Beneficiaries Receiving Offsets in the Next Year if Currently Not in Receipt		Average Percentage of Full Benefit Paid if in Receipt of Offsets	
	Current Assumption	Proposed Assumption	Current Assumption	Proposed Assumption
1	35.0%	36.0%	25.0%	27.0%
2	30.0%	27.0%	26.0%	26.0%
3	24.0%	23.0%	27.0%	26.0%
4	14.0%	16.0%	27.0%	26.0%
5	14.0%	14.0%	27.0%	26.0%
6	9.2%	9.0%	27.0%	26.0%
7	6.3%	4.0%	27.0%	26.0%
8+	0.0%	0.0%	30.0%	30.0%



VSDP – Catastrophic Claims

- LTD income replacement benefits are higher if disability is determined to be catastrophic
 - 80% income replacement level vs. the standard 60%

- Need to estimate average full income replacement percentage for future disabled members
 - Current assumption is 61%
 - Recent experience suggests 7% VSDP members are determined to be catastrophic and receiving 80% income replacement level.

Experience	Current Assumption	Proposed Assumption
61.4%	61%	62%



VSDP/VLDP – Rates of Termination Due to Recovery or Death



- Probability that disabled participant ends coverage due to recovery or death. We utilize the 2012 GLTD study with adjustment factors based on experience.

	Current Assumption		Proposed Assumption	
	Male	Female	Male	Female
4 – 24	0.904	0.907	0.852	0.803
25 – 60	0.891	0.943	0.811	0.821
61 – 120	1.052	1.025	1.164	1.184
121 and over	1.021	0.999	1.073	1.126



VSDP/VLDP – Other

- In addition to an income replacement benefit, disabled members of VLDP may be eligible to receive a one percent employer contribution to their defined contribution account, if they meet Social Security Definition of Disability
 - In reviewing the percentage of VLDP members expected to receive a one percent employer contribution to their defined contribution account, we recommend decreasing the utilization assumption from 70.5% to 65.2%