



**Municipal Pensions
Oversight Board**

**Municipal Policemen's and
Firemen's Pension and Relief Funds
of West Virginia**

**Experience and Assumption Study
July 1, 2020 to June 30, 2024 Experience**

Bolton

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August 7, 2026

Mr. Blair M. Taylor
Executive Director
West Virginia Municipal Pensions Oversight Board
301 Eagle Mountain Road, Suite 251
Charleston, WV 25311

Dear Blair,

This report presents the results of our experience study of the 53 Municipal Policemen's and Firemen's Pension and Relief Funds of West Virginia and includes our recommended changes to plan assumptions. These recommendations are generally based on:

- Our findings from the study of the economic and demographic experience of the plans for the period June 1, 2020 through June 30, 2024, and
- Our expectations, based on professional judgement, estimates inherent in market data, emerging trends, and expert opinions, of future experience.

We summarize our recommendations in the *Summary of Recommendations* section and provide details of our analysis in the *Economic Assumptions* and *Demographic Assumptions* sections. Finally, we present in the *Impact of Changes* section the effect of the proposed changes on plan liabilities and funding levels based on the July 1, 2024 actuarial valuations. The actual recommended changes will be implemented for the July 1, 2026 valuations in accordance with the West Virginia Municipal Pensions Oversight Board *Experience Study Procedure* issued June 16, 2017.

The actuarial methods, including the actuarial cost method, asset smoothing methods, amortization methods, and roll-forward methods, were reviewed as part of the experience study published in 2020. After the issuance of that report, the amortization method was updated by legislation developed in consultation with Bolton. The actuarial methods, which were designed to be transparent, sustainable, and durable in order to achieve policy objectives and mitigate agency risk, were not included as part of this study.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "James Ritchie".

James Ritchie, ASA, EA, FCA, MAAA

A handwritten signature in black ink, appearing to read "Jordan McClane".

Jordan McClane, FSA, EA, FCA, MAAA

A handwritten signature in black ink, appearing to read "Alan Torroella".

Alan Torroella, ASA, EA

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Section I. Introduction

An actuarial valuation report is a very important resource for various stakeholders of public pension plans. These reports can take on many forms depending on their purpose(s) (for instance, funding actuarial valuation reports provide plan sponsors with information regarding historical funding patterns and upcoming employer contributions, while accounting actuarial valuation reports provide information to be presented in plan and employer financial statements). Regardless of type, purpose, or principal, an actuarial valuation report is based on assumptions about the future economic and demographic experience anticipated to impact the payment of future benefit payments from a pension plan.

While these assumptions often directly impact liability measurements and short-term contributions, *actual* (rather than *assumed*) experience ultimately determines the true, long-term costs of a pension plan through:

- (1) Plan benefits paid (including cost-of-living adjustments, COLAs, as applicable),
- (2) Investment return on plan assets, and
- (3) Payment of other plan-related expenses

As actual experience differs from the actuarial assumptions, the expected cost of the plans and, consequently, the contributions to fund the plans generally¹ will gradually change. Ideally, the assumptions will closely track actual experience. However, for some assumptions (in particular, investment return), actual experience will commonly and materially vary from the assumption from year to year. While the cost of the plan will “self-adjust” to reflect¹ actual experience, it is important to review and reset the assumptions from time to time to:

- (1) Minimize experience gains and losses,
- (2) Reduce contribution volatility, and
- (3) Achieve a better level of intergenerational taxpayer equity

For some assumptions (e.g., mortality), plan experience alone is insufficient to be statistically significant, and as such, industry tables should be considered in addition to experience when setting those assumptions. Also, certain economic assumptions (e.g., inflation and cost-of-living adjustments) require longer periods of experience to be considered in conjunction with future expectations.

Actuarial Standard of Practice (ASOP) number 27 requires the actuary to select assumptions that are individually reasonable and consistent with other assumptions. In addition, ASOP 27 requires the actuary to disclose the rationale for the assumptions used in the actuarial valuation. One of the most common approaches for developing reasonable assumptions in compliance with ASOP 27 is an experience study, which combines the review of past experience with forecasts of future expectations.

This is the third experience study that Bolton has conducted for the 53 Municipal Policemen’s and Firemen’s Pension and Relief Funds of West Virginia under the oversight of the West Virginia Municipal Pensions Oversight Board (WV MPOB). The first and second experience studies examined data during the three-year periods from July 1, 2014 to June 30, 2017 and from July 1, 2017 through June 30, 2020, respectively. Pursuant to our recommendation and the Board’s approval during the March 2026 meeting, this experience study deviates from the

¹ If the contribution calculation methodology does not adhere to actuarial principles for developing Actuarially Determined Contributions (ADCs) or if the plan sponsor does not make contributions that align with the ADC, differences between experience and plan assumptions may not impact actual plan contributions in the short term.

typical three-year study period specified in the 2017 *Experience Study Procedure* by including an additional year (data from July 1, 2020 to June 30, 2024, rather than June 30, 2023) in order to dampen any impacts from the COVID pandemic. For this same reason, experience during this study was also compared to experience during the prior two studies to isolate COVID shocks.

As with the prior studies, we have emphasized the importance of developing assumptions that reflect a best estimate of *future* plan experience. Rather than change every assumption to exactly match actual recent experience, we have analyzed the *trends* inherent in that experience and have developed assumptions that reflect expectations of future experience. Given the frequency that experience studies are performed for these plans, we would not anticipate major adjustments to the actuarial assumptions without a corresponding fundamental shift in the workforce or economy. Thus, unsurprisingly, we have recommended only minor adjustments to the current assumptions which, in turn, are anticipated to have a small impact on total valuation results.

Section V of this report presents the impact of the proposed assumption changes on the liabilities and funding levels had these new assumptions been in place for the July 1, 2024 valuation. Actual changes will first impact the July 1, 2026 valuation, which will develop the contributions for the fiscal year ending June 30, 2028 (FY 2028).

Bolton has prepared this report exclusively for the WV MPOB. The purpose of this report is to provide recommended assumption changes and the impact of those recommendations on results. This report may not be used or relied upon by any other party or for any other purpose; Bolton Partners is not responsible for the consequences of any unauthorized use.

This report is based on data provided by the 53 municipal plans. The plans are solely responsible for the validity, accuracy, and comprehensiveness of this information. If the data supplied are not accurate and complete, the experience study results may differ significantly from the results that would be developed with accurate and complete information; such a scenario could require a later revision of this report. While we did not audit the data, we believe the data is appropriate for the purpose used.

Professional Qualifications

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest that would impair the objectivity of our work.



James Ritchie, ASA, EA, FCA, MAAA



Jordan McClane, FSA, EA, FCA, MAAA



Alan Torroella, ASA, EA

Section II. Summary of Recommendations

The period studied experienced a variety of high-impact events including the COVID pandemic, high inflation, investment market highs and lows, and fluctuations in the economy and government spending. Periods of economic volatility can result in historical experience that may not be representative of future experience. Determining whether an observed result is an outlier versus a new reality requires judgement. For example, the Society of Actuaries tracked higher mortality due to COVID but decided against developing new mortality improvement scales. Furthermore, high inflation during the study period is unlikely to continue for the long term. For this study, we have relied on experience, judgement, and caution when making recommendations.

We analyzed the aggregate experience over the four-year study period and the experience in each of the individual years for each assumption to gain a better understanding of the impact of the COVID pandemic. The results for each year were compared to the other years and to the aggregate results from the prior two experience studies to identify outliers that may have resulted from COVID.

Based on our review, we recommend **no changes** to the **economic** assumptions.

We have the following recommendations related to the **demographic** assumptions:

- Lower the **excess wage growth (productivity)** assumption from 100 basis points to 75 basis points, ultimately changing the wage growth assumption from 3.50% to 3.25%.
- In conjunction with the above change, lower the **new hire pay growth** assumption from 3.50% to 3.25%.
- Update the assumed **merit-based salary increases** at all levels of service. The recommended assumption is marginally higher at some levels of service and marginally lower at others.
- Update the **mortality** assumption:
 - Healthy:
 - From: PubS-2010 (B) Healthy projected generationally from the 2010 base year using Scale MP-2021
 - To: 114% of the PubS-2016 (B) Healthy projected generationally from the 2016 base year using Scale MP-2021
 - Disabled:
 - From: PubS-2010 Disabled, with base rates set forward five years, projected generationally from the 2010 base year using Scale MP-2021
 - To: PubS-2016 Disabled (no set forward of base rates) projected generationally from the 2016 base year using Scale MP-2021
- Update the **retirement** rate assumption for (1) police by decreasing the rate at age 50 and at ages 55-57, and for (2) fire by increasing rates at ages 53-59.
- Update the **turnover** rate assumption by making small adjustments at various ages for both police and fire.
- Scale down all **disability** rates by 5% but keep the line-of-duty disability percentage assumption unchanged at 50% of total disabilities.
- Lower the **percentage married** assumption from 70% to 65%.

Thus, we recommend no changes to the following assumptions:

- Inflation
- Cost-of-living adjustment
- Premium tax increase
- Investment return and discount rate
- Pay spiking
- Gainful employment offset for non-duty disabilities
- Spouse age difference
- Non-spouse load
- Remarriage assumption

We discuss the actual experience, recommended assumption changes (shown in **bold typeface** for readability), and rationale within Sections III (*Economic Assumptions*) and IV (*Demographic Assumptions*) and show the effect of these changes on the pension funding levels in Section V (*Impact of Changes*).

Section III. Economic Assumptions

Economic assumptions often attempt to capture the driving forces of an economy, typically encompassing a broad environment that reaches beyond the bounds of an individual plan's population. We reviewed the following economic assumptions:

- Inflation
 - Cost-of-Living Adjustment (COLA)
 - Premium Tax increase
- Discount Rate
- Administrative Expenses

Inflation and COLA

The inflation assumption is one of the principle building blocks for all other economic assumptions, including the COLA, premium tax increase, and investment return assumptions. Thus, our economic experience analysis starts with the inflation assumption. The current inflation assumption is 2.50%.

Unlike demographic assumptions where recent past experience is a key predictor of future experience, economic assumptions reflect future expectations that often consider convergence to historical norms or targeted equilibrium. For the inflation assumption, we considered the following:

- Past experience – based on the Consumer Price Index for all Urban Consumers (CPI-U) over the last 5, 10, 15, 20 and 25 years
- Current expectations of future experience – based on investment experts' analysis and the Federal Reserve forecasts of future expected inflation.

The Supplemental Pension Benefits (i.e., COLAs) are indexed to the CPI-U and incorporate a cap. Pursuant to West Virginia Code §8-22-26a, an annual COLA is effective on the first day of each July after the second anniversary of the retiree's date of retirement. The COLA is calculated on the first \$15,000 of the initial annual benefit and on the COLAs accumulated since benefit commencement. Based on guidance received from the WV MPOB during the December 15, 2022 board meeting, the 4% limit is compared to this change in annual average CPI. Thus, if the CPI change is between 4.0% and 5.3% (equal to 4.0% / 75%), the COLA is limited to 4.0%, but if the CPI change is greater than 5.3%, then the 4.0% limit does not apply.

Past Inflation Experience

Presented on the following page are the average annual increases in the CPI-U, the same basis used for determining the COLA percentage, over multiple time periods (ending with the annual average for calendar year 2025):

	Averaging Period				
	10 years	20 years	25 years	30 years	35 years
CPI-U Annual Average	3.11%	2.53%	2.53%	2.52%	2.61%

The economy experienced high levels of inflation over the three-year period following the onset of COVID from mid-2020 through mid-2023, averaging approximately 5.5% per year. Thus, averaging over shorter recent periods (10 years and under) reflects that bias.

Experts' Inflation Expectations

Next, we considered the inflation assumption built into investment return assumptions. The 2025 edition of the *Horizon Survey of Capital Market Assumptions* (2025 Horizon Survey), which encompasses capital market assumptions from over 40 investment advisors, shows an average 10-year future expected inflation rate of 2.38% and a 20-year rate of 2.40%².

Further, we considered the inflation expectations from Federal Reserve Banks:

- In May 2026, the Philadelphia Federal Reserve published its *Survey of Professional Forecasters*, which summarized the expectations from 33 panelists. Over the next 10 years, the forecasters predict annual average headline CPI inflation of 2.40%.
- The Federal Reserve Bank of St. Louis' prediction as of May 1, 2026 of the 10-year breakeven inflation rate was 2.48%.
- The Federal Reserve Bank of Cleveland estimates inflation using a model based on Treasury yields, inflation data, inflation swaps, and survey-based measures of inflation expectations. Their May 2026 estimate of 30-year inflation is 2.5%.

Finally, in their *2025 Trustees Report*, the Social Security Administration uses a long-term intermediate inflation assumption of 2.40%.

Recommended Inflation Assumption

Given the historical long-term annual averages and expectations of future inflation from investment managers, Federal Reserve Banks, and Social Security, we recommend the continued use of the current **2.50% inflation assumption (no changes)**.

Past COLA Experience

Shown below is a table comparing the change in CPI with the WV MPOB COLA rate that would have been applied on the allowable amount in all prior years during the averaging period based on the current COLA provisions and cap:

	Averaging Period				
	10 years	20 years	25 years	30 years	35 years
CPI-U Annual Average	3.11%	2.53%	2.53%	2.52%	2.61%
COLA	3.01%	2.48%	2.49%	2.49%	2.58%
Difference	-0.10%	-0.05%	-0.04%	-0.03%	-0.03%

Recommended COLA Assumption

To account for the COLA cap that applies when the increase in CPI is between 4.0% and 5.3%, we recommend a five basis-point reduction in the inflation assumption to arrive at a **COLA assumption of 2.45% (unchanged from current assumption)**.

² The 10-year inflation expectation is based on all 41 survey respondents, while the 20-year inflation expectation is based on all 27 survey respondents that provided a long-term expectation.

Premium Tax Increase

Historical net premium tax amounts (after expenses) for 2002 and the last decade are presented below. The numbers in the table below exclude reallocations from expired allocations in the prior years.

Year	Amount	Annual Increase		Geometric Avg. Increase to 2025	
		Premium Tax	Annual Avg. CPI-U	Premium Tax	Annual Avg. CPI-U
2002	\$9,9xx,xxx ³	N/A	N/A	≈ 4.4%	2.6%
...	...	...	...	...	...
2016	17,406,426	4.7%	1.3%	5.0%	3.3%
2017	17,899,708	2.8%	2.1%	5.3%	3.5%
2018	18,280,163	2.1%	2.4%	5.7%	3.6%
2019	19,500,066	6.7%	1.8%	5.6%	3.9%
2020	19,968,579	2.4%	1.2%	6.2%	4.5%
2021	19,502,393	-2.3%	4.7%	8.5%	4.4%
2022	18,133,819	-7.0%	8.0%	14.2%	3.2%
2023	21,461,342	18.3%	4.1%	12.1%	2.8%
2024	24,826,970	15.7%	2.9%	8.7%	2.6%
2025	26,982,132	8.7%	2.6%	N/A	N/A

Prior to the start of the COVID pandemic, the premium tax amount increased on average faster than CPI, but premium tax revenue was down in 2021 and 2022 likely due to the aftermath of the pandemic. As with CPI, the premium tax amount has rebounded significantly since that time but is beginning to taper off.

The current assumption is that the premium taxes as well as the CPI will increase by 2.50% annually. Although premium tax increases have outpaced inflation, much of that excess was due to the significant premium tax increases over the past three years.

Recommended Premium Tax Increase Assumption

Given that *sustained* premium tax revenue increases in excess of inflation would likely require a underlying shift in the collection base (or change in rates charged) of insurance revenues (from which an amount is allocated to the premium tax fund for these plans), we recommend the continued alignment of the price inflation assumption and premium tax increase assumption (**no change from current 2.50% assumption**).

Investment Return and Discount Rate

The single assumption that has the largest effect on the determination of plan liabilities, funding levels, and near-term actuarially determined contributions (ADCs) is the discount rate. For many public sector pension plans, the discount rate assumption is set equal to the expected return on assets assumption to minimize expected gains and losses and reduce contribution volatility. However, they are two distinct assumptions covered in separate sections (3.7 Selecting an Investment Return Assumption and 3.8 Selecting a Discount Rate) of Actuarial Standard of Practice 27 (*Selection of Assumptions for Measuring Pension Obligations*). The application of such an equivalence in a valuation demonstrates that, for the purpose of the valuation, the pension payouts (plan liabilities) are valued in relation to the expected return on assets.

³ From page 11 of the Consolidated Actuarial Valuation Report for the Year Beginning July 1, 2011 prepared by GRS.
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Section 3.7 of ASOP 27 lists a series of considerations when determining the investment return assumption, such as inflation, illiquidity, credit risk, macroeconomic conditions, investment volatility, investment manager performance, expenses, and others. Many of these considerations can be reviewed through an analysis of the expected return and volatility of returns for the plan's assets based on a target allocation of investments, which is often stated in the plan's investment policy statement (IPS). For a single plan, performing such a task is straightforward. Developing an assumption set for 53 different plans requires more finesse and may warrant additional or different considerations.

The actual investment return that will be achieved for each fund will be dependent on the asset allocation (and individual investments) of each fund independently (not in the aggregate). The asset allocation, in turn, is often a function of the investment horizon, which will differ by plan. The duration of benefit payments and, likewise, the investment horizon, will be shorter for plans closed to new entrants than for open plans where the active population is still contributing meaningfully to the liability. Thus, a blanket, single-rate assumption for all plans would not be appropriate since the 53 plans have separate asset allocations, investment strategies, and investment horizons.

A matrix has been used for over a decade to map different discount rates to different plans for this assumption. While it has morphed over time, the core principles remain relatively unchanged. A key component of the matrix is exposure to growth-oriented investments. Many of the plans have assets invested with the West Virginia Investment Management Board (IMB). Based on a typical IMB allocation, the 10-year and 20-year expected geometric returns are 7.17% and 7.55%, respectively, using the capital market assumptions (CMAs) from the *2025 Horizon Survey* (see the first table on the following page). In comparison to the median plan not investing with the IMB, the IMB has lower investment fees and a more aggressive investment strategy with higher allocations to equities and alternatives given that they are not subject to the restrictions under WV Code §8-22-22a.

Funding policy is also considered by the matrix. By design, the Standard, Optional, and Optional II funding policies incorporate the relationship of plan assets to liabilities in the contribution development, and therefore, these plans can self-adjust to match experience through the amortization of gains and losses. The Alternative funding policy, by contrast, does not incorporate this relationship. Plans using this policy can suffer from prolonged, depressed funded statuses after investment losses since immediate reciprocated increases to contributions are absent from that policy.

A review of asset allocation alone considers neither the severe impact of unfavorable experience on the long-term funded status for plans using the Alternative funding policy nor the sustainability of contributing the developed contributions. To account for these exposures under the Alternative funding policy, the matrix uses an approach similar to that used for setting the discount rate for GASB accounting. The matrix rates for the Alternative policy are a blend (based on the projected funded status in 15 years) of portfolio expected returns and a hypothetical AA municipal bond yield of 4.00%. The portfolio expected returns were developed using the *2025 Horizon Survey* CMAs and the allocation to growth-oriented assets was generally modeled as the average between the two thresholds; for instance, the 50% or more line was modeled using an allocation of 55% (see the second table on the following page).

Typical IMB Allocation

Data From Horizon Actuarial's 2025 Capital Market Assumption Survey

Mapped to Horizon Asset Classes		(Net of Inflation) Real Return		(Arithmetic Return) Inflation Assumption		Arithmetic Return		Geometric Return		Weighted	
		10-Year	20-Year	10-Year	20-Year	10-Year	20-Year	10-Year	20-Year		
Horizon CMAs (all respondents)	Target Allocation									St. Dev	St. Dev
1 US Equity - Large Cap	21.60%	5.28%	5.88%	2.39%	2.41%	7.67%	8.29%	6.39%	7.00%	16.54%	3.57%
2 US Equity - Small/Mid Cap	14.40%	6.48%	6.94%	2.39%	2.41%	8.87%	9.35%	6.92%	7.38%	20.44%	2.94%
3 Non-US Equity - Developed	4.50%	6.19%	6.55%	2.39%	2.41%	8.58%	8.96%	7.03%	7.35%	18.20%	0.82%
4 Non-US Equity - Emerging	4.50%	7.57%	8.22%	2.39%	2.41%	9.96%	10.63%	7.38%	7.91%	23.43%	1.05%
5 US Corp Bonds - Core	15.00%	2.80%	2.87%	2.39%	2.41%	5.19%	5.28%	5.00%	5.10%	6.22%	0.93%
6 US Corp Bonds - Long Duration	0.00%	3.22%	3.39%	2.39%	2.41%	5.61%	5.80%	5.04%	5.28%	10.74%	0.00%
7 US Corp Bonds - High Yield	0.00%	4.05%	4.41%	2.39%	2.41%	6.44%	6.82%	5.97%	6.33%	9.77%	0.00%
8 Non-US Debt - Developed	0.00%	1.80%	1.88%	2.39%	2.41%	4.19%	4.29%	3.89%	3.99%	7.48%	0.00%
9 Non-US Debt - Emerging	0.00%	4.18%	4.46%	2.39%	2.41%	6.57%	6.87%	6.03%	6.30%	10.62%	0.00%
10 US Treasuries (Cash Equiv)	0.00%	1.21%	1.20%	2.39%	2.41%	3.60%	3.61%	3.58%	3.59%	1.47%	0.00%
11 TIPS (Inflation-Protected)	0.00%	2.24%	2.20%	2.39%	2.41%	4.63%	4.61%	4.44%	4.41%	6.04%	0.00%
12 Real Estate	12.00%	5.13%	5.18%	2.39%	2.41%	7.52%	7.59%	6.21%	6.38%	16.24%	1.95%
13 Hedge Funds	10.00%	3.86%	4.16%	2.39%	2.41%	6.25%	6.57%	5.92%	6.24%	7.97%	0.80%
14 Commodities	0.00%	3.81%	3.96%	2.39%	2.41%	6.20%	6.37%	4.67%	4.76%	17.83%	0.00%
15 Infrastructure	0.00%	5.91%	6.24%	2.39%	2.41%	8.30%	8.65%	7.22%	7.52%	14.86%	0.00%
16 Private Equity	12.00%	9.12%	9.73%	2.39%	2.41%	11.51%	12.14%	9.13%	9.63%	22.18%	2.66%
17 Private Debt	6.00%	6.19%	6.30%	2.39%	2.41%	8.58%	8.71%	7.91%	8.08%	11.75%	0.71%
	100.00%										
Portfolio Arithmetic Return						7.97%	8.36%				
Portfolio Variance										1.61%	
Standard Deviation										12.7%	
Portfolio Geometric Return (net of inv expenses)								7.17%	7.55%		

Non-IMB: 50% or more

Data From Horizon Actuarial's 2025 Capital Market Assumption Survey

Mapped to Horizon Asset Classes		(Net of Inflation) Real Return		(Arithmetic Return) Inflation Assumption		Arithmetic Return		Geometric Return		Weighted	
		10-Year	20-Year	10-Year	20-Year	10-Year	20-Year	10-Year	20-Year		
Horizon CMAs (all respondents)	Target Allocation									St. Dev	St. Dev
1 US Equity - Large Cap	22.44%	5.28%	5.88%	2.39%	2.41%	7.67%	8.29%	6.39%	7.00%	16.54%	3.71%
2 US Equity - Small/Mid Cap	14.96%	6.48%	6.94%	2.39%	2.41%	8.87%	9.35%	6.92%	7.38%	20.44%	3.06%
3 Non-US Equity - Developed	5.61%	6.19%	6.55%	2.39%	2.41%	8.58%	8.96%	7.03%	7.35%	18.20%	1.02%
4 Non-US Equity - Emerging	3.74%	7.57%	8.22%	2.39%	2.41%	9.96%	10.63%	7.38%	7.91%	23.43%	0.88%
5 US Corp Bonds - Core	36.00%	2.80%	2.87%	2.39%	2.41%	5.19%	5.28%	5.00%	5.10%	6.22%	2.24%
6 US Corp Bonds - Long Duration	0.00%	3.22%	3.39%	2.39%	2.41%	5.61%	5.80%	5.04%	5.28%	10.74%	0.00%
7 US Corp Bonds - High Yield	0.00%	4.05%	4.41%	2.39%	2.41%	6.44%	6.82%	5.97%	6.33%	9.77%	0.00%
8 Non-US Debt - Developed	0.00%	1.80%	1.88%	2.39%	2.41%	4.19%	4.29%	3.89%	3.99%	7.48%	0.00%
9 Non-US Debt - Emerging	0.00%	4.18%	4.46%	2.39%	2.41%	6.57%	6.87%	6.03%	6.30%	10.62%	0.00%
10 US Treasuries (Cash Equiv)	9.00%	1.21%	1.20%	2.39%	2.41%	3.60%	3.61%	3.58%	3.59%	1.47%	0.13%
11 TIPS (Inflation-Protected)	0.00%	2.24%	2.20%	2.39%	2.41%	4.63%	4.61%	4.44%	4.41%	6.04%	0.00%
12 Real Estate	6.60%	5.13%	5.18%	2.39%	2.41%	7.52%	7.59%	6.21%	6.38%	16.24%	1.07%
13 Hedge Funds	1.65%	3.86%	4.16%	2.39%	2.41%	6.25%	6.57%	5.92%	6.24%	7.97%	0.13%
14 Commodities	0.00%	3.81%	3.96%	2.39%	2.41%	6.20%	6.37%	4.67%	4.76%	17.83%	0.00%
15 Infrastructure	0.00%	5.91%	6.24%	2.39%	2.41%	8.30%	8.65%	7.22%	7.52%	14.86%	0.00%
16 Private Equity	0.00%	9.12%	9.73%	2.39%	2.41%	11.51%	12.14%	9.13%	9.63%	22.18%	0.00%
17 Private Debt	0.00%	6.19%	6.30%	2.39%	2.41%	8.58%	8.71%	7.91%	8.08%	11.75%	0.00%
	100.00%										
Portfolio Arithmetic Return						6.69%	6.99%				
Portfolio Variance										0.97%	
Standard Deviation										9.8%	
Portfolio Geometric Return (net of inv expenses)								6.21%	6.51%		

Although only the 50% or more allocation is shown in the second table on the previous page, the exercise was performed for each rung of the following matrix, which displays the current assumption.

Discount Rate Matrix for Plans Not Investing with the IMB				
Growth-Oriented Asset Exposure ⁴	Discount Rate – Standard, Optional, and Optional II Policies	Funded Ratio as of Valuation Date ⁵	Projected Funded Ratio after 15 Years ⁵	Discount Rate – Alternative Policy
60% or more	6.50%	30% or more	70% or more	6.25%
50% or more	6.25%	30% or more	70% or more	6.00%
40% or more	6.00%	30% or more	60% or more	5.50%
30% or more	5.75%	15% or more	50% or more	5.00%
20% or more	5.50%	15% or more	40% or more	4.75%
Less than 20%	5.00%	Less than 15%	15% or more	4.25%
Less than 20%	5.00%	Less than 15%	Less than 15%	4.00%

Discount Rate Matrix for Plans Investing with the IMB				
Growth-Oriented Asset Exposure ⁴	Discount Rate – Standard, Optional, and Optional II Policies	Funded Ratio as of Valuation Date ⁵	Projected Funded Ratio after 15 Years ⁵	Discount Rate – Alternative Policy
N/A	7.00%	30% or more	70% or more	6.50%
N/A	7.00%	30% or more	60% or more	6.00%
N/A	7.00%	15% or more	50% or more	5.50%
N/A	7.00%	15% or more	40% or more	5.25%
N/A	7.00%	Less than 15%	15% or more	4.75%
N/A	7.00%	Less than 15%	Less than 15%	4.50%

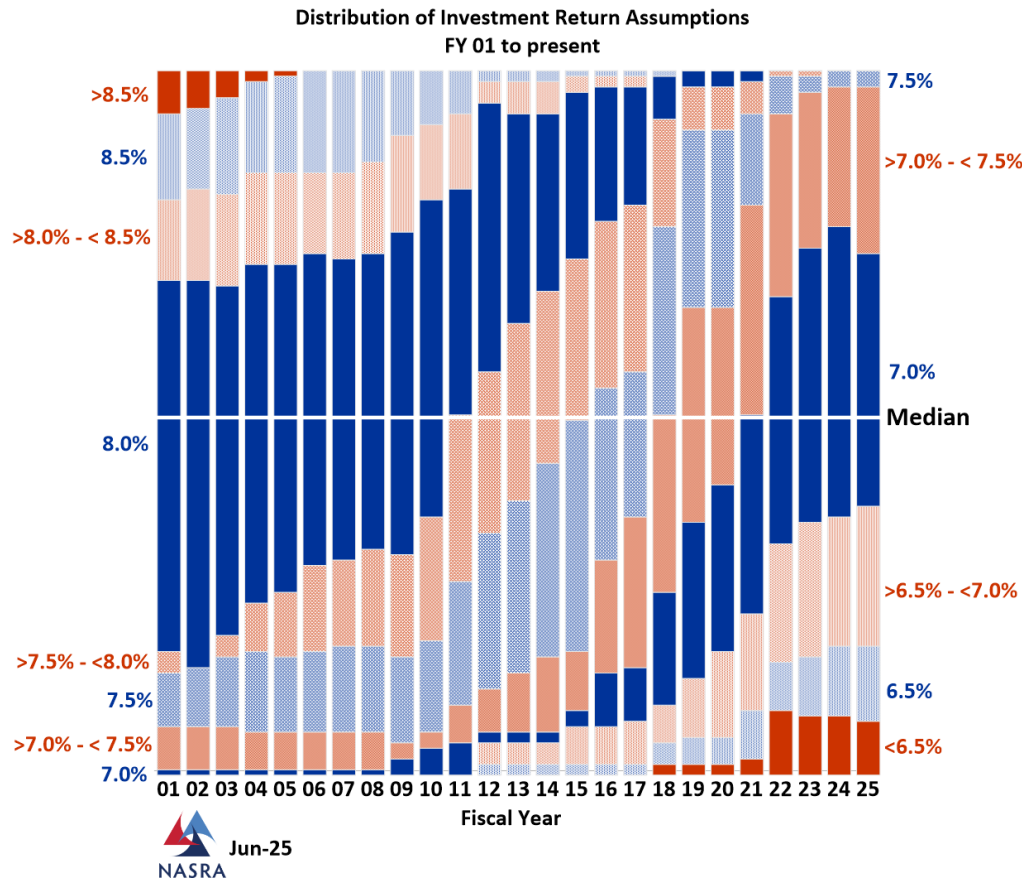
Some public sector plan sponsors utilize a discount rate assumption that incorporates a conservatism margin for their funding valuations since the contribution requirements increase following years in which investment returns do not meet the assumption. As such, they set the discount rate assumption lower than the expected investment return to increase the probability that the fund's return will meet or exceed the discount rate.

From a fiduciary standpoint, one of the primary goals of a pension system is to adequately and systematically fund the plan to ensure that promised benefits can be paid in full. Achieving this goal often entails the consideration of supporting, and sometimes competing, objectives, such as mitigating undo pressure on the sponsor, participants, or other stakeholders and balancing contribution development and volatility with intergenerational equity.

The MPOB might also find interesting the NASRA survey of investment returns that follows on the next page. The survey results should not be construed as a benchmarking comparison for the WV MPOB (or any other system) as the additional dimension of investment allocation, which is a primary driver of the assumption, is not shown for the surveyed plans. Instead, the survey provides context to trends in investment return assumptions over time for large public pension plans.

⁴ Based on the target allocation percentage (if provided) to growth-oriented assets in the IPS; otherwise, it is based on a review of the actual growth-oriented asset exposure over the past four years.

⁵ Funded ratios based on a 5.0% investment return assumption.



Recommended Investment Return/Discount Rate Assumption

Based on all of these considerations and our analysis above, the recommended rates developed (rounded to 25 basis points) at each of the rungs of the discount rate matrix are unchanged from the current assumption. Thus, we recommend the continued use of the current matrices (**no changes**) for determining the discount rate assumption for all 53 plans.

Administrative Expenses

The current assumption for the amount of administrative (non-investment) expenses for the contribution year is the average of the expenses from the prior two fiscal years, adjusted for inflation to the year of the contribution.

Recommended Administrative Expenses Assumption

We recommend the continued use of the current assumption (**no changes**) for administrative expenses as this method is auto-adjusting and easily explained.

Section III. Demographic Assumptions

This section addresses our review and recommendations regarding all demographic assumptions, which, in contrast to the economic assumptions, are generally based on the underlying plan population.

Wage Inflation in Excess of Price Inflation (Productivity)

The wage inflation in excess of price inflation assumption, sometimes referred to as productivity growth, contains elements of both an economic assumption and a demographic assumption since the ability of a locality to support excess wage growth may be constrained by the broader economy.

National Perspective

In the United States, real wages (i.e., wage growth in excess of price inflation) rose strongly for several decades after the end of the World War II. Since the 1980s, real wages have experienced periods of both growth and decline, averaging (geometric) about 90 basis points per year of growth when measured as the change in the Social Security National Average Wage (SS NAW) relative to the change in CPI-U. Also during that time, nominal wage increases declined steadily, with the 20-year geometric average of the change in the SS NAW falling from 6.3% in the period ending in 1990 to 3.4% for the period ending in 2024. The 20-year geometric average even dipped below 3.0% just prior to the onset of COVID.

In mature economies, high excess wage inflation is unsustainable over the long term without extraordinary advances or a fundamental shift in production. However, certain industries or local economies may be more or less primed for growth than the national economy.

Plan Perspective

The salary reported in the valuation data for each member includes all pensionable pay, including overtime. Although base pay and overtime are not reported separately, we understand that, at a national level, overtime levels could have been severely impacted by the COVID pandemic and ensuing years. Without that granular data, we could not isolate any overtime outliers. For purposes of this study, wage growth was measured as the change in average pensionable salary for the population at each service level over the four-year period. For instance, aggregate wage growth at 10 years of service was measured as the average salary for members with 10 years of service in the July 1, 2024 valuation data, divided by the average salary for members with 10 years of service in the July 1, 2020 valuation data. To determine the annual wage growth, the four-year growth result was raised to the $(1/4)$ power, from which 1 was subtracted. This exercise was performed at each year of service.

Given the spike in inflation after the pandemic and that salaries tend to lag inflation, we analyzed the excess wage growth (i.e., above price inflation) by creating various sets of results, each subtracting a different four-year geometric average price inflation rate (varying from the period ending in August 2023 through July 2024). From this exercise, the excess wage inflation over the four-year period generally ranged from 0.25% to 0.75%.

Recommended Excess Wage Inflation Assumption

We recommend **decreasing the excess wage growth assumption from 1.00% to 0.75%**. The reduced rate better aligns with recent experience and the national trend in the SS NAW.

New Hire Pay Growth

The current assumption is that the average pay for new hires will be 3.50% higher than the pay for the prior year's average new hire. The 3.50% assumption is the sum of the general inflation assumption of 2.50% and the wage inflation increment (productivity growth) of 1.00%.

Note that this assumption generally aligns with the final rate of salary increase in the total salary scale assumption since employees nearing the end of long careers generally have reached their peak job proficiency/abilities, and likewise, are not expected to receive many increases that exceed the sum of the general and additional wage inflation increases (i.e. no additional merit increases at those later years).

The final rate of assumed salary increase and the new hire pay growth assumption are also often related to an overall payroll growth assumption. Such is the case for plans that are assumed to have achieved a steady state population in which the number of actives in the plan is assumed to remain relatively level over the foreseeable future. Plans (other than the WV plans) that develop contributions which include amortizations calculated as a level percentage of payroll use this assumption to determine amortization amounts. However, the WV plans use level dollar, rather than level percentage of pay, amortizations, and as such, the payroll growth assumption is not used for these valuations.

Recommended New Hire Pay Growth Assumption

In conjunction with the reduction in the excess wage growth assumption, we recommend **decreasing the new hire pay growth assumption from 3.50% to 3.25%**.

Merit-Based Pay Increases

The salary increase assumption is comprised of the following three components:

1. General Inflation
2. Excess Wage Growth
3. Merit Increase

The total salary increase rate at each year of service is equal to the following:

$$(1 + \text{General Inflation} + \text{Excess Wage Growth}) * (1 + \text{Merit Increase}) - 1$$

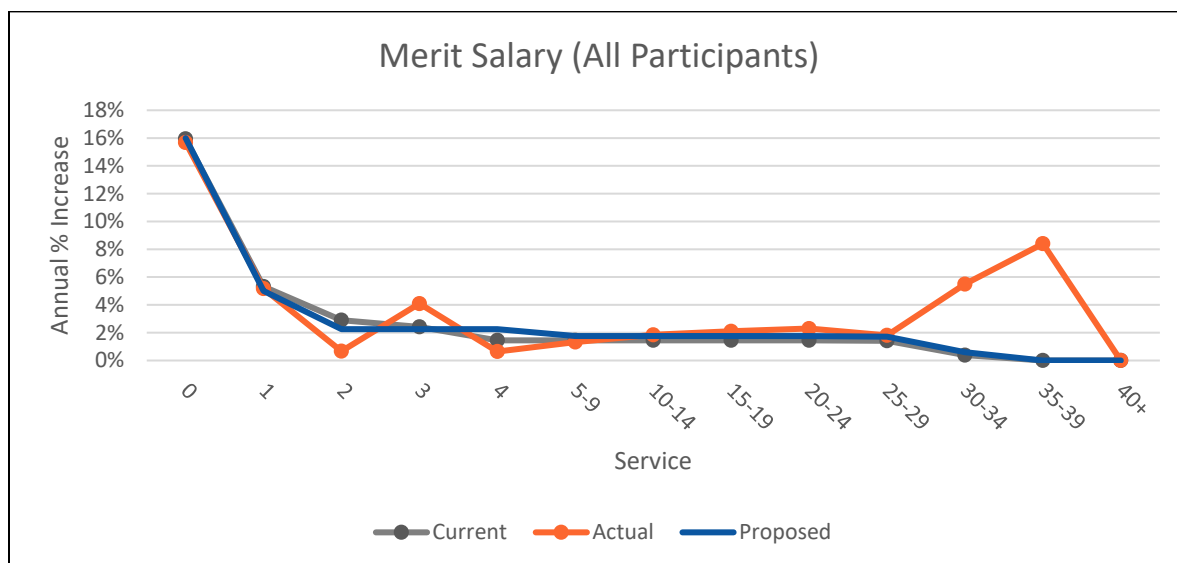
To analyze merit increases, we removed from the total salary increases the increases due to wage inflation (general inflation and excess wage growth).

The current and proposed merit increase assumptions are shown below:

Years of Service	Current	Proposed
0	15.94%	16.00%
1	5.31%	5.00%
2	2.90%	2.25%
3	2.42%	2.25%
4	1.45%	2.25%
5-9	1.45%	1.75%
10-24	1.45%	1.75%
25-28	1.45%	1.75%
29-33	0.48%	0.75%
34+	0.0%	0.00%

The following table shows, by years of service, the number of exposures, the actual merit increase, the expected merit increase using the current and proposed assumptions, and the actual-to-expected ratios using the current and proposed assumptions. Presented beneath the table is a graph of the rates of merit increases based on actual experience, the current merit increase assumptions, and the proposed merit increase assumptions.

Years of Service	Exposures	Merit Increases (Police and Fire)				
		Actual	Expected - Current Assumptions	Actual / Current Expected	Expected - Proposed Assumptions	Actual / Proposed Expected
0	188	15.68%	15.94%	98%	16.00%	98%
1	178	5.17%	5.31%	97%	5.00%	103%
2	173	0.66%	2.90%	23%	2.25%	29%
3	150	4.09%	2.42%	169%	2.25%	182%
4	167	0.64%	1.45%	44%	2.25%	28%
5-9	673	1.32%	1.45%	91%	1.75%	75%
10-14	1,013	1.85%	1.45%	127%	1.75%	105%
15-19	1,074	2.09%	1.45%	145%	1.75%	120%
20-24	603	2.29%	1.45%	158%	1.75%	131%
25-29	130	1.80%	1.41%	128%	1.71%	105%
30-34	16	5.50%	0.38%	1446%	0.59%	931%
35-39	4	8.40%	0.00%	0%	0.00%	0%
≥40	0	0.00%	0.00%		0.00%	
Total:	4,369	2.43%	2.07%	118%	2.31%	105%



We note that the years of service groupings after 29 years of service are based on a very limited number of exposures. The large salary increases for those years of service are likely based on individual circumstances (e.g., overtime or chief promotion).

Recommended Merit-Based Pay Increases Assumption

The recommended **changes (in table on previous page)** to the merit-based pay increase assumption better align with recent experience, which we believe is an appropriate proxy for expected future experience.

Pay Spiking at Retirement

For the experience study published in 2020, we reviewed the level of increases in average compensation associated with the inclusion of unused accrued leave balances and elevated overtime in the final year of employment. Our data sample size included only the members eligible for the Beckley Fire DROP. Also during that study experience study, a majority of the municipalities provided a general estimate of the average percentage of final compensation that is attributable to accrued leave time. From the data and the general estimated provided, we recommended the use of a 6% load to average annual compensation in the computation of active retirement and termination pension benefits.

Recommended Pay Spiking at Retirement Assumption

We recommend the continued use of the current 6% load **(no changes)** to average annual compensation in the computation of active retirement and termination pension benefits.

Pay data in the years leading up to DROP entry should be available later in the fall of this year (2026) when retrospective DROP analyses for all plans with DROP will be performed.

Mortality

The current assumption is:

Healthy (Post-Retirement):

PubS-2010 (B) Healthy Retiree Mortality Table projected generationally from the 2010 base year using Scale MP-2021

Disabled

PubS-2010 Disabled Retiree Mortality Table with base rates set forward 5 years and projected generationally from the 2010 base year using Scale MP-2021

Healthy (Pre-Retirement):

PubS-2010 (B) Employee Mortality Table projected generationally from the 2010 base year using Scale MP-2021

The mortality experience over the last four years is as follows:

Population	Number of Deaths		Actual/Expected
	Expected	Actual	
Healthy Retirees and Beneficiaries	232.3	318	137%
Disabled Retirees	31.7	47	148%
Pre-Retirement	5.3	5	94%

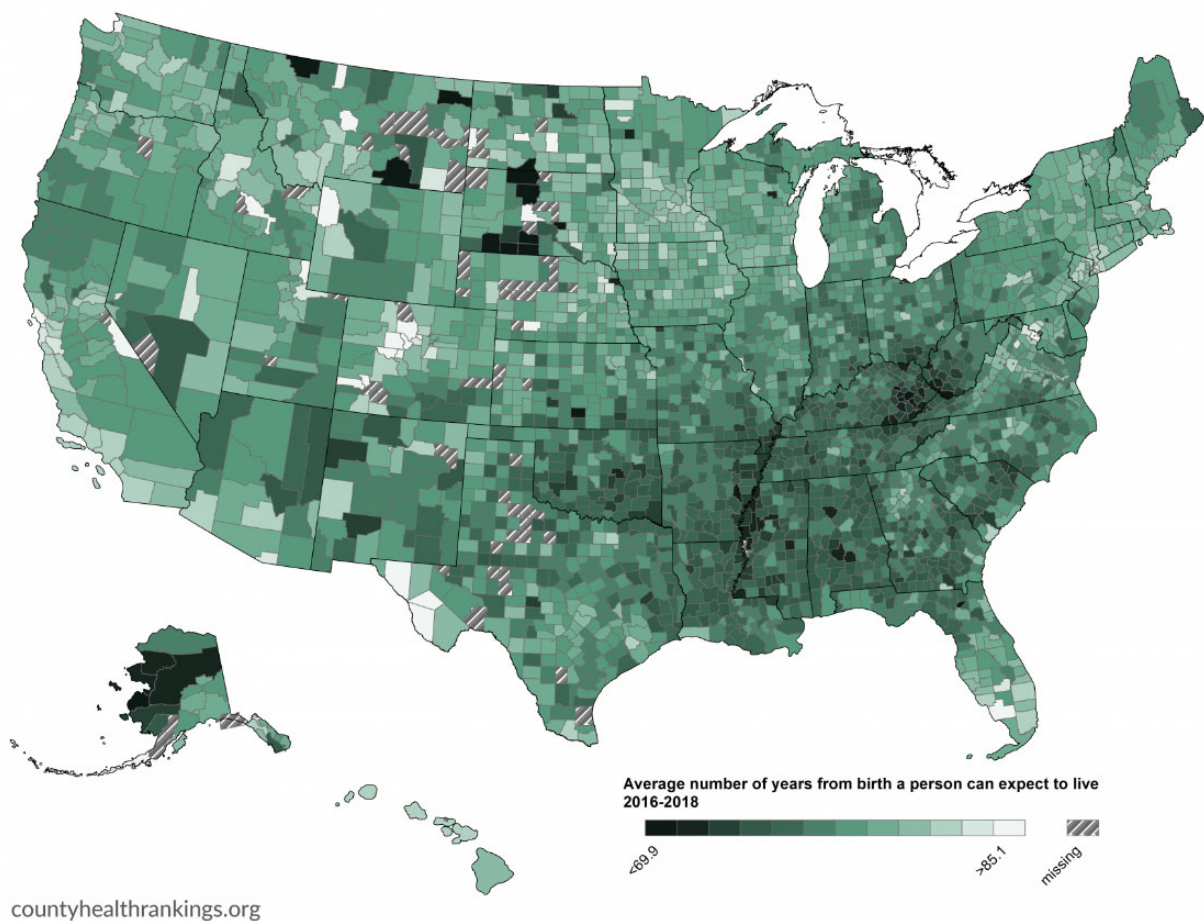
The above results are based on headcounts (i.e. the number of deaths). The actual-to-expected ratios generally decline when weighting mortality experience by benefit amounts:

Population	Amount-Weighted Deaths		Actual/Expected
	Expected	Actual	
Healthy Retirees and Beneficiaries	\$6.388M	\$8.072M	126%
Disabled Retirees	\$0.777M	\$1.171M	151%
Pre-Retirement	\$0.217M	\$0.187M	86%

Using an amounts-weighted approach to setting the mortality assumption may be preferred to using a headcount-weighted approach given that both of the following are true:

- Numerous studies (including by the Society of Actuaries and mortality data analytics firm ClubVita) have shown that mortality rates are correlated with income level. Members with larger pensions are generally expected to live longer, on average, than members with lower pensions.
- An approach that attempts to capture the movement of liability, rather than the movement of headcount, should result in lower actuarial gains and losses. The ratio of the benefit amounts for two retirees who are the same age and sex is a very close proxy for the ratio of their liabilities.

On both a headcount-weighted and amount-weighted basis, the post-retirement healthy mortality deaths (headcounts and dollars) were higher than expected. This result is consistent with higher general mortality in West Virginia compared to national averages. The following graphic from the *2020 County Health Rankings Key Findings Report* illustrates this point. Additionally, County Health Rankings lists a 2025 life expectancy in West Virginia as 72.4 years, compared to the national average of 77.6 years.



The Board's June 16, 2017 *Experience Study* procedure includes the following statement:

"The actuary must use the most recent accepted mortality tables as directed by the Actuarial Standards of Practice (ASOP) in effect at the time of the experience study. It is expected the mortality tables used will at a minimum be two-dimensional tables, which include a generational mortality component."

Since the prior experience study, the Society of Actuaries (SOA) released a new version of the public sector mortality tables, Pub-2016 (base year of 2016, rather than 2010 in the previous version of the table).

The current assumption uses the below median income version⁶ (i.e., the “(B)” in the name of the table) of the public safety Pub-2010 mortality tables given the higher mortality experienced in WV compared to the national average.

The total number of deaths of healthy individuals in payment was enough over the four-year period to warrant the use of partial credibility theory to apply a scaler to the base table. Partial credibility was determined on an amounts-weighted (rather than headcount-weighted) basis using the Limited Fluctuation Credibility Theory and a 90% probability that the difference between the experience and true probability is within 5%. This approach resulted in a scaler of 1.14 to the base table. To mitigate COVID impacts over this experience study period, we performed this same exercise also using data from the prior two experience studies. That exercise resulted in a similar scaler (1.15).

There were not sufficient deaths of disabled annuitants to warrant the use of partial credibility theory for disability mortality.

Furthermore, the SOA has not released a newer mortality improvement scale than MP-2021.

Recommended Mortality Assumptions

We recommend **updating the base mortality tables** to the newest below median income versions of the public safety tables, including a scaler on the base rates for healthy mortality, and continuing the use of mortality improvement scale MP-2021.

To summarize, **we recommend the following mortality assumption:**

Healthy (Post-Retirement):

114% of the PubS-2016 (B) Healthy Retiree Mortality Table projected generationally from the 2016 base year using Scale MP-2021.

Disabled

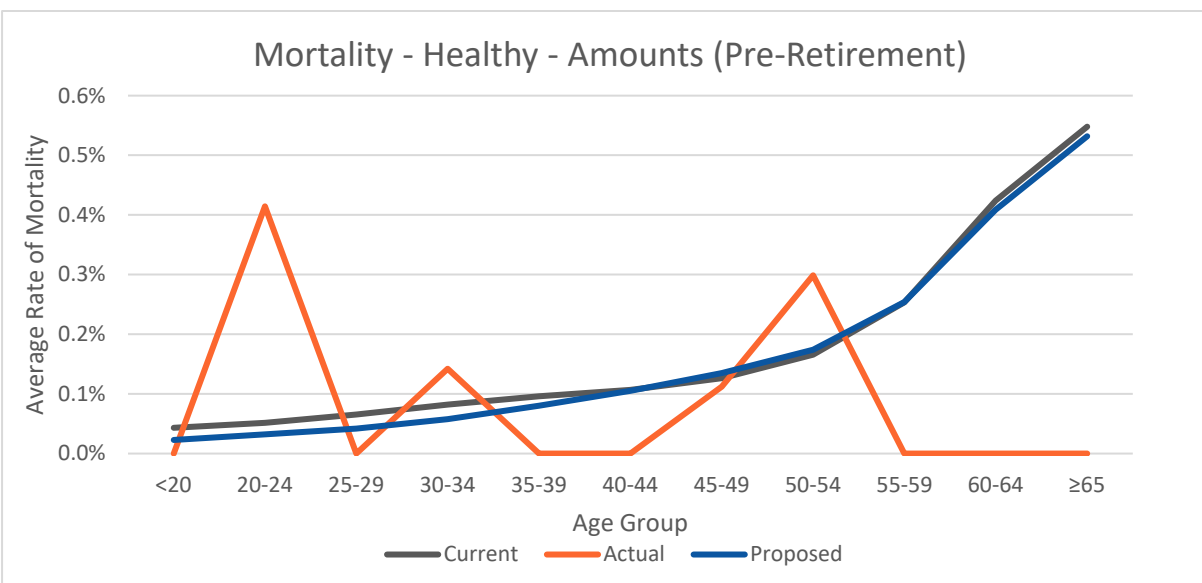
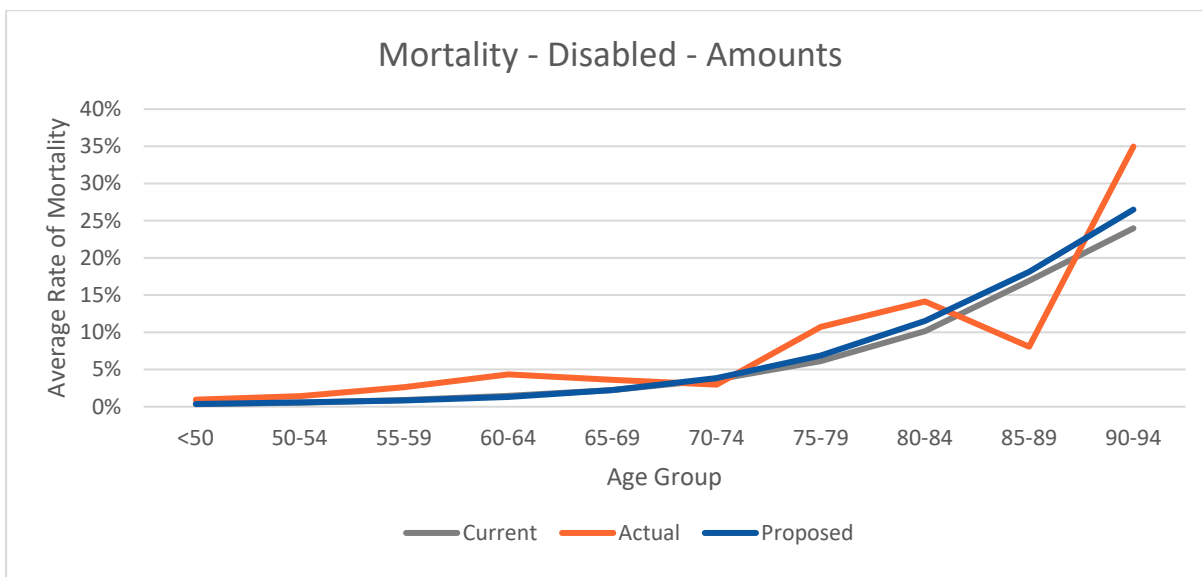
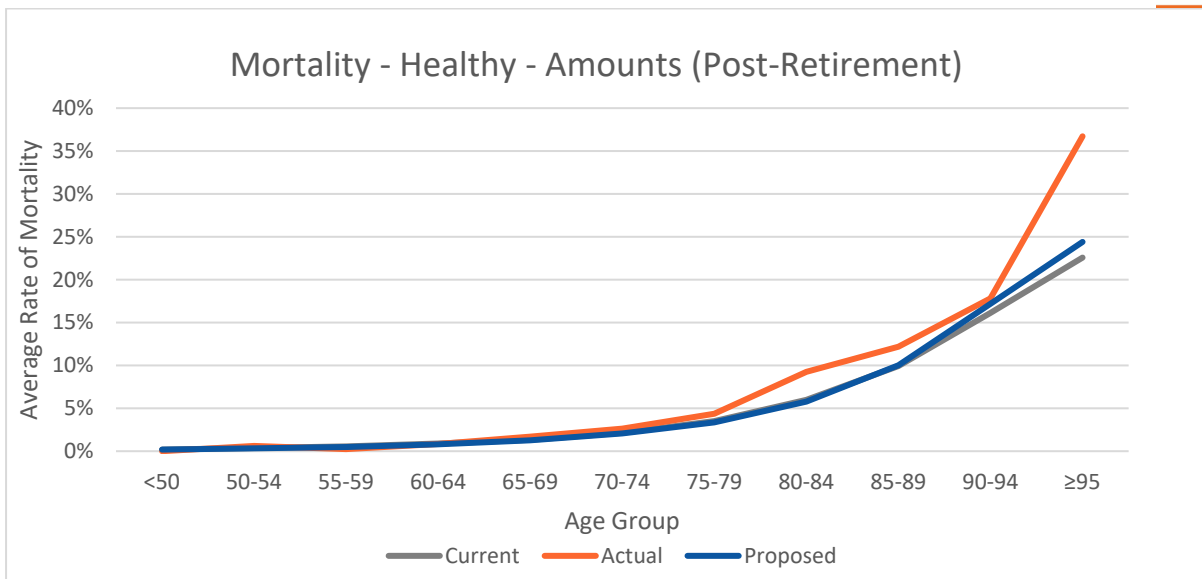
PubS-2016 Disabled Retiree Mortality Table projected generationally from the 2016 base year using Scale MP-2021

Healthy (Pre-Retirement):

114% of the PubS-2016 (B) Employee Mortality Table projected generationally from the 2016 base year using Scale MP-2021

The following three graphs show the amount-weighted mortality rates for the actual experience, as well as the current assumptions and proposed assumptions.

⁶ a below median income version for disabled retirees was not produced by the SOA
WV MPOB Experience Study



Retirement

Normal retirement is defined as the earlier of (1) age 50 and the completion of 20 years of service and (2) age 65. The plans do not have early retirement provisions. Current retirement assumptions are based on age for those who have the required service

The experience (see tables on the following pages) shows that (1) fewer retirement-eligible Police members are retiring at age 50 and ages 55-57 than expected and (2) more retirement-eligible Fire members are retiring at ages 53-59 than expected.

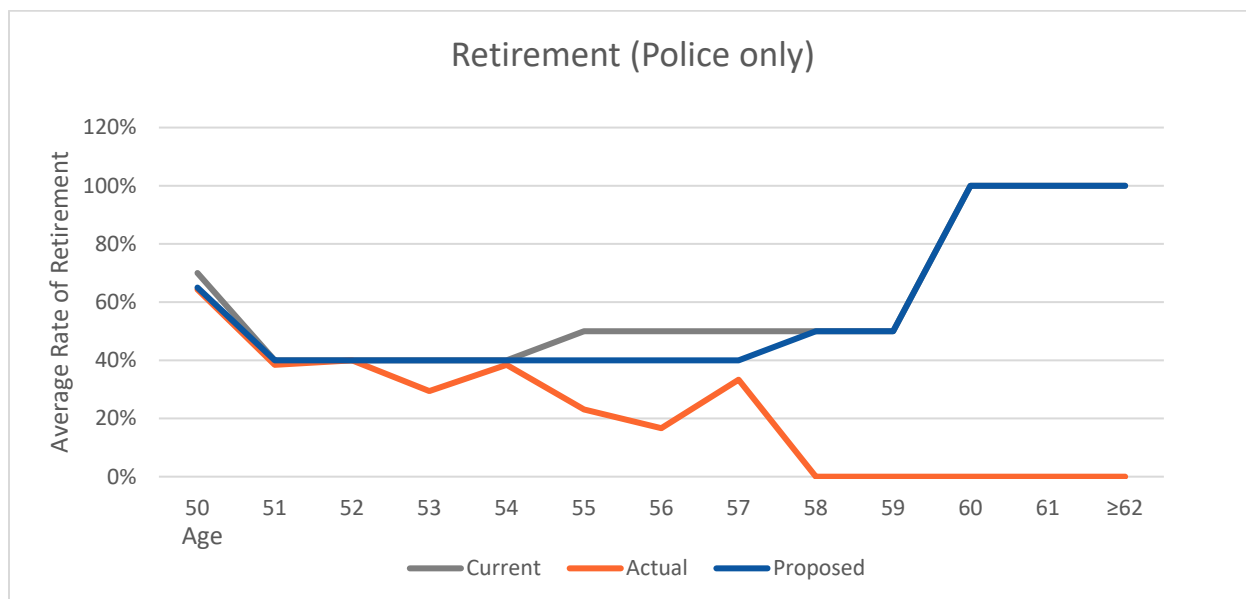
A comparison of the current and proposed rates are shown below:

Age	Current Police Rate	Proposed Police Rate	Current Fire Rate	Proposed Fire Rate
50	70%	65%	55%	55%
51	40%	40%	35%	35%
52	40%	40%	35%	35%
53	40%	40%	25%	30%
54	40%	40%	25%	30%
55	50%	40%	25%	30%
56	50%	40%	25%	30%
57	50%	40%	15%	30%
58	50%	50%	15%	30%
59	50%	50%	15%	30%
≥60	100%	100%	100%	100%

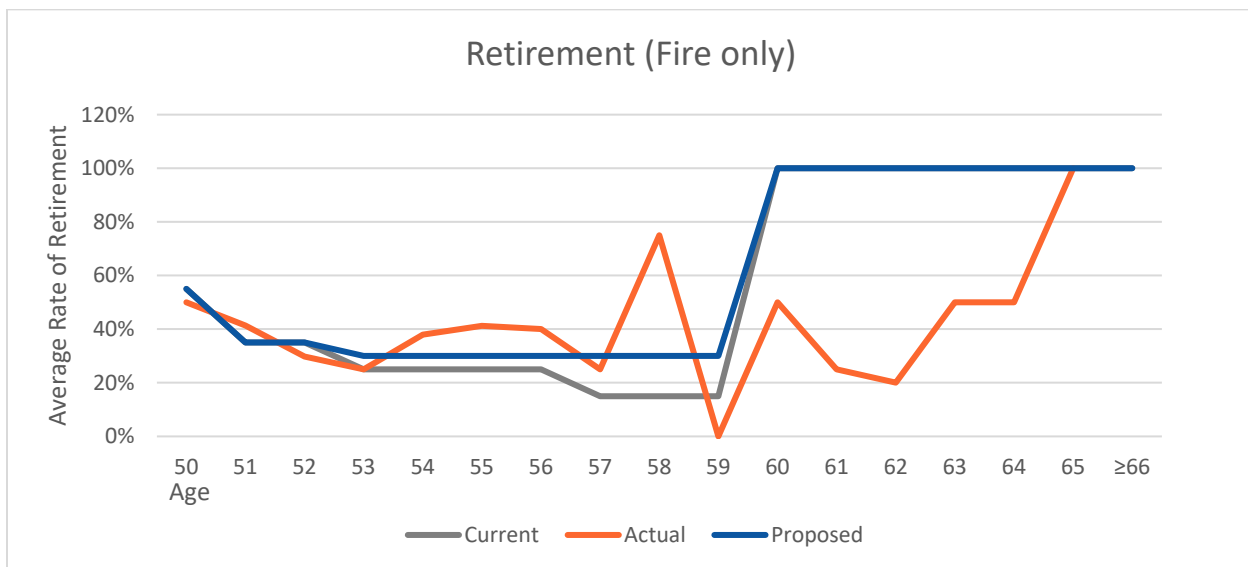
The following two tables show, by age, the number of retirement exposures, the expected number of retirements using the current assumptions, the actual number of retirements, the actual-to-expected ratios using the current assumptions, the expected number of retirements using the proposed assumptions, and the actual-to-expected ratios using the proposed assumptions.

Presented beneath each table is a graph of the rates of retirement based on actual experience, the current retirement assumptions, and the proposed retirement assumptions.

Retirement Rates (Police Only)						
Age	Exposures	Expected from Current Assumptions	Actual	Actual / Expected	Expected from Proposed Assumption	Actual / Expected (Proposed Rates)
50	73	51.1	47	92%	47.5	99%
51	39	15.6	15	96%	15.6	96%
52	25	10.0	10	100%	10.0	100%
53	17	6.8	5	74%	6.8	74%
54	13	5.2	5	96%	5.2	96%
55	13	6.5	3	46%	5.2	58%
56	6	3.0	1	33%	2.4	42%
57	3	1.5	1	67%	1.2	83%
58	3	1.5	0	0%	1.5	0%
59	2	1.0	0	0%	1.0	0%
60	2	2.0	0	0%	2.0	0%
61	1	1.0	0	0%	1.0	0%
≥62	0	0.0	0	0%	0.0	0%
Total	197	105.2	87	83%	99.4	88%



Retirement Rates (Fire Only)						
Age	Exposures	Expected from Current Assumptions	Actual	Actual / Expected	Expected from Proposed Assumption	Actual / Expected (Proposed Rates)
50	80	44.0	40	91%	44.0	91%
51	46	16.1	19	118%	16.1	119%
52	37	13.0	11	85%	13.0	85%
53	36	9.0	9	100%	10.8	82%
54	29	7.3	11	152%	8.7	122%
55	17	4.3	7	165%	5.1	140%
56	10	2.5	4	160%	3.0	133%
57	8	1.2	2	167%	2.4	100%
58	8	1.2	6	500%	2.4	300%
59	2	0.3	0	0%	0.6	0%
60	4	4.0	2	50%	4.0	50%
61	4	4.0	1	25%	4.0	25%
62	5	5.0	1	20%	5.0	20%
63	4	4.0	2	50%	4.0	50%
64	2	2.0	1	50%	2.0	50%
65	1	1.0	1	100%	1.0	100%
≥66	0	0.0	0	0%	0.0	0%
Total	293	118.9	117	98%	126.1	93%



Assumed retirement rates are generally different for plans that have a Deferred Retirement Option Program (DROP). As of the July 1, 2024 actuarial valuations, six plans (Beckley Fire, Beckley Police, Clarksburg Fire, South Charleston Fire, Vienna Police, and Wheeling Fire) have DROPs. Within these plans, there have only been a handful of retirements since implementing the DROPs. As such, we have drawn on our experience with other plans throughout the nation that offer DROPs in developing a methodology to adjust the retirement rates for plans without a DROP to accommodate shifting retirement behavior under DROPs.

The philosophy underlying the adjustment methodology is that the implementation of DROPs may make some members enter DROP earlier than they would have otherwise retired and may make some members stay longer (through DROP exit) than they would have otherwise in the absence of a DROP.

All six current DROPs have a maximum DROP participation period of five years. The current assumption is that members currently in DROP as of the valuation date are assumed to exit DROP upon the earlier of attaining 5 years of DROP participation and attaining age 60. If a member is at least age 60 on the valuation date but has fewer than 5 years of DROP service, the member is assumed to exit DROP in one year. Upon DROP exit, a member is assumed to receive the DROP account balance as a lump sum and start receiving annuity payments. For active members who are not currently in DROP as of the valuation date, the same methodology is applied.

Based on that methodology, we propose the DROP entry retirement rates and DROP election percentages (the percentage of total retirements that represent members entering DROP versus leaving employment) presented on the following page.

Recommended Retirement Assumption

We recommend **changes (in table on page 19 and the following page)** to the retirement assumption to better align with recent experience, which we believe is an appropriate proxy for expected future experience.

Police Plans with DROP

Proposed DROP Entry Retirement Rates

	Years of Service										
Age	20	21	22	23	24	25	26	27	28	29	30
50	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%
51	81%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
52	81%	59%	50%	50%	50%	50%	50%	50%	50%	50%	50%
53	81%	62%	54%	65%	65%	65%	65%	65%	65%	65%	65%
54	82%	62%	54%	67%	69%	69%	69%	69%	69%	69%	69%
55	85%	71%	68%	85%	100%	100%	100%	100%	100%	100%	100%
56	84%	63%	55%	77%	100%	100%	100%	100%	100%	100%	100%
57	82%	60%	52%	73%	100%	100%	100%	100%	100%	100%	100%
58	85%	67%	57%	80%	100%	100%	100%	100%	100%	100%	100%
59	80%	67%	50%	67%	100%	100%	100%	100%	100%	100%	100%
60	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Proposed DROP Election Rates

	Years of Service										
Age	20	21	22	23	24	25	26	27	28	29	30
50	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%
51	80%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
52	80%	16%	28%	28%	28%	28%	28%	28%	28%	28%	28%
53	80%	20%	33%	33%	33%	33%	33%	33%	33%	33%	33%
54	80%	17%	29%	29%	45%	45%	45%	45%	45%	45%	45%
55	81%	25%	40%	40%	57%	100%	100%	100%	100%	100%	100%
56	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
57	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
58	76%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
59	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Fire Plans with DROP

Proposed DROP Entry Retirement Rates

	Years of Service										
Age	20	21	22	23	24	25	26	27	28	29	30
50	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
51	76%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
52	76%	50%	42%	42%	42%	42%	42%	42%	42%	42%	42%
53	74%	46%	39%	44%	44%	44%	44%	44%	44%	44%	44%
54	74%	46%	39%	44%	41%	41%	41%	41%	41%	41%	41%
55	86%	78%	80%	92%	100%	100%	100%	100%	100%	100%	100%
56	84%	59%	51%	74%	100%	100%	100%	100%	100%	100%	100%
57	82%	53%	51%	74%	100%	100%	100%	100%	100%	100%	100%
58	82%	46%	40%	74%	100%	100%	100%	100%	100%	100%	100%
59	72%	46%	30%	46%	100%	100%	100%	100%	100%	100%	100%
60	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Proposed DROP Election Rates

	Years of Service										
Age	20	21	22	23	24	25	26	27	28	29	30
50	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
51	82%	24%	24%	24%	24%	24%	24%	24%	24%	24%	24%
52	82%	25%	40%	40%	40%	40%	40%	40%	40%	40%	40%
53	84%	30%	46%	46%	46%	46%	46%	46%	46%	46%	46%
54	84%	30%	46%	46%	63%	63%	63%	63%	63%	63%	63%
55	86%	58%	74%	74%	85%	100%	100%	100%	100%	100%	100%
56	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
57	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
58	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
59	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Termination of Employment

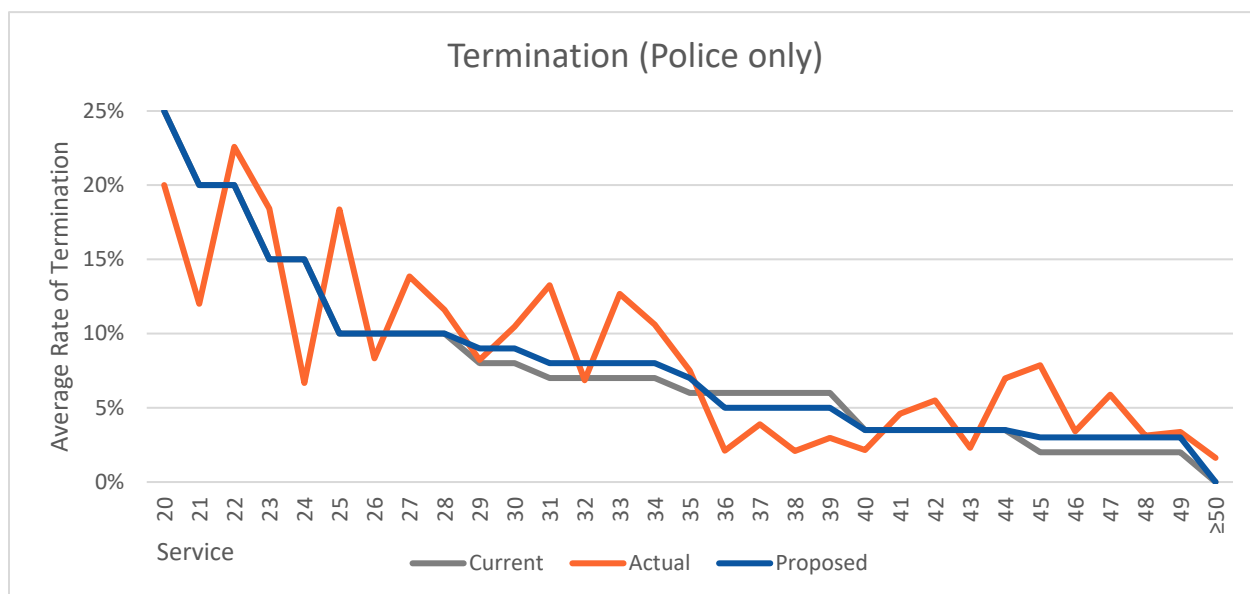
Current and proposed termination assumptions, which vary based on age, are displayed below:

Police					
Age	Current	Proposed	Age	Current	Proposed
<20	25%	25%	35	6%	7%
20	25%	25%	36	6%	5%
21	20%	20%	37	6%	5%
22	20%	20%	38	6%	5%
23	15%	15%	39	6%	5%
24	15%	15%	40	3.5%	3.5%
25	10%	10%	41	3.5%	3.5%
26	10%	10%	42	3.5%	3.5%
27	10%	10%	43	3.5%	3.5%
28	10%	10%	44	3.5%	3.5%
29	8%	9%	45	2%	3%
30	8%	9%	46	2%	3%
31	7%	8%	47	2%	3%
32	7%	8%	48	2%	3%
33	7%	8%	49	2%	3%
34	7%	8%	>=50	0%	0%

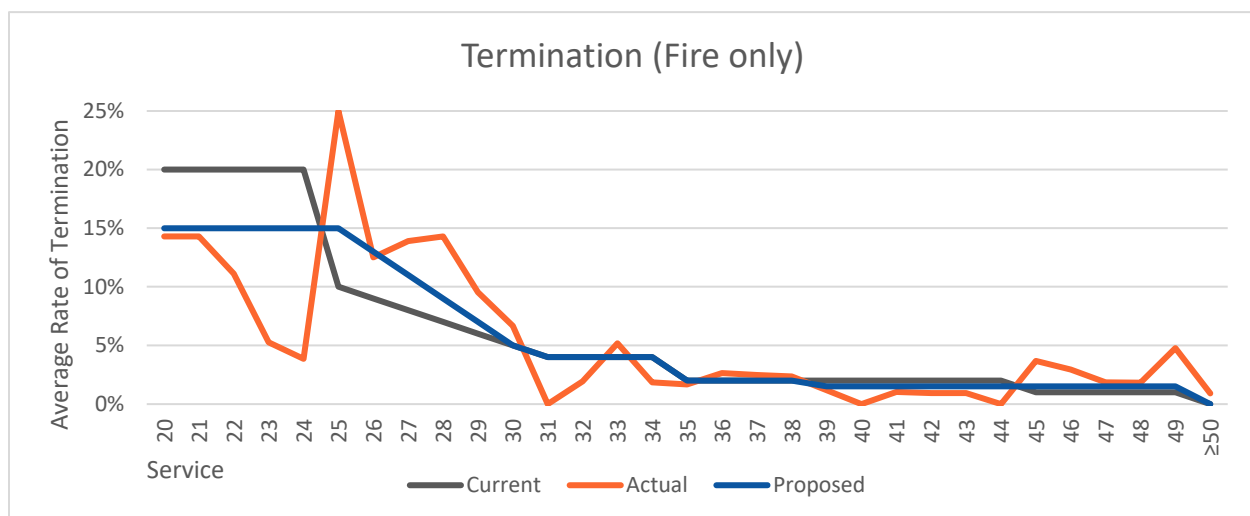
Fire					
Age	Current	Proposed	Age	Current	Proposed
<20	20%	15%	35	2%	2%
20	20%	15%	36	2%	2%
21	20%	15%	37	2%	2%
22	20%	15%	38	2%	2%
23	20%	15%	39	2%	1.5%
24	20%	15%	40	2%	1.5%
25	10%	15%	41	2%	1.5%
26	9%	13%	42	2%	1.5%
27	8%	11%	43	2%	1.5%
28	7%	9%	44	2%	1.5%
29	6%	7%	45	1%	1.5%
30	5%	5%	46	1%	1.5%
31	4%	4%	47	1%	1.5%
32	4%	4%	48	1%	1.5%
33	4%	4%	49	1%	1.5%
34	4%	4%	>=50	0%	0%

The following two tables show, by age, the number of termination exposures, the expected number of terminations using the current assumptions, the actual number of terminations, the actual-to-expected ratios using the current assumptions, the expected number of terminations using the proposed assumptions, and the actual-to-expected ratios using the proposed assumptions. Presented beneath each table is a graph of the rates of termination based on actual experience, the current termination assumptions, and the proposed termination assumptions.

Termination Rates (Police Only)						
Age	Exposures	Expected from Current Assumptions	Actual	Actual / Expected	Expected from Proposed Assumptions	Actual / Expected (Proposed Rates)
<20	2	0.5	1	200%	0.5	200%
20-24	149	26.2	22	84%	26.2	84%
25-29	316	30.1	37	123%	30.9	120%
30-34	379	27.4	41	150%	31.2	131%
35-39	475	28.5	17	60%	25.4	67%
40-44	444	15.5	19	122%	15.5	122%
45-49	447	8.9	21	235%	13.4	157%
Total	2,212	137.2	158	115%	143.0	110%



Termination Rates (Fire Only)						
Age	Exposures	Expected from Current Assumptions	Actual	Actual / Expected	Expected from Proposed Assumptions	Actual / Expected (Proposed Rates)
<20	1	0.2	0	0%	0.2	0%
20-24	84	16.8	7	42%	12.6	56%
25-29	173	13.5	25	185%	18.4	136%
30-34	258	10.8	8	74%	10.8	74%
35-39	387	7.7	8	103%	7.3	109%
40-44	504	10.1	3	30%	7.6	40%
45-49	513	5.1	15	292%	7.7	195%
Total	1,920	64.3	66	103%	64.5	102%



The current termination rates for both Police and Fire are highest at younger ages, with rates gradually declining with increases in age. This pattern (higher rates at younger ages and for members with fewer years of service) is common among public safety plans. For Police, since recent experience shows more than anticipated terminations at age groups 25-34 and 44-49, we have proposed increasing the termination rates for these groups. For Fire, since recent experience shows more than anticipated terminations at age groups 25-30, fewer than anticipated for age group 40-44, and more than anticipated for age group 40-49, we have proposed increasing, decreasing, and increasing the termination rates for these groups, respectively.

Disability Incidence

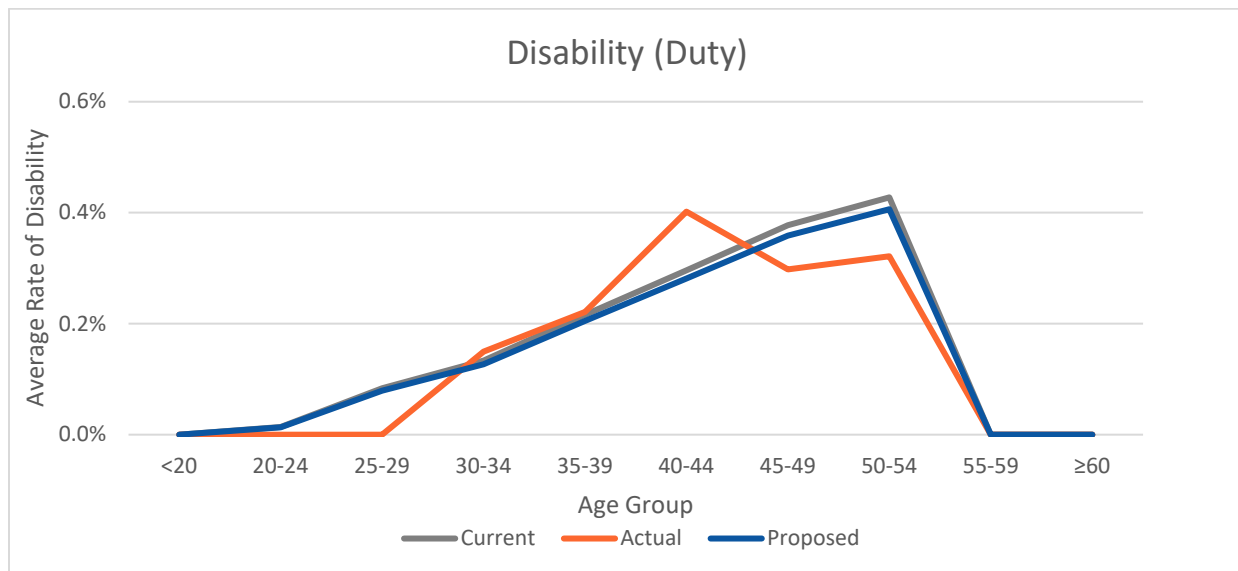
Current disability assumptions are based on age. The assumed disability incidence rates at a few sample ages are presented below:

Age	Rates
30	0.25%
40	0.57%
50	0.88%

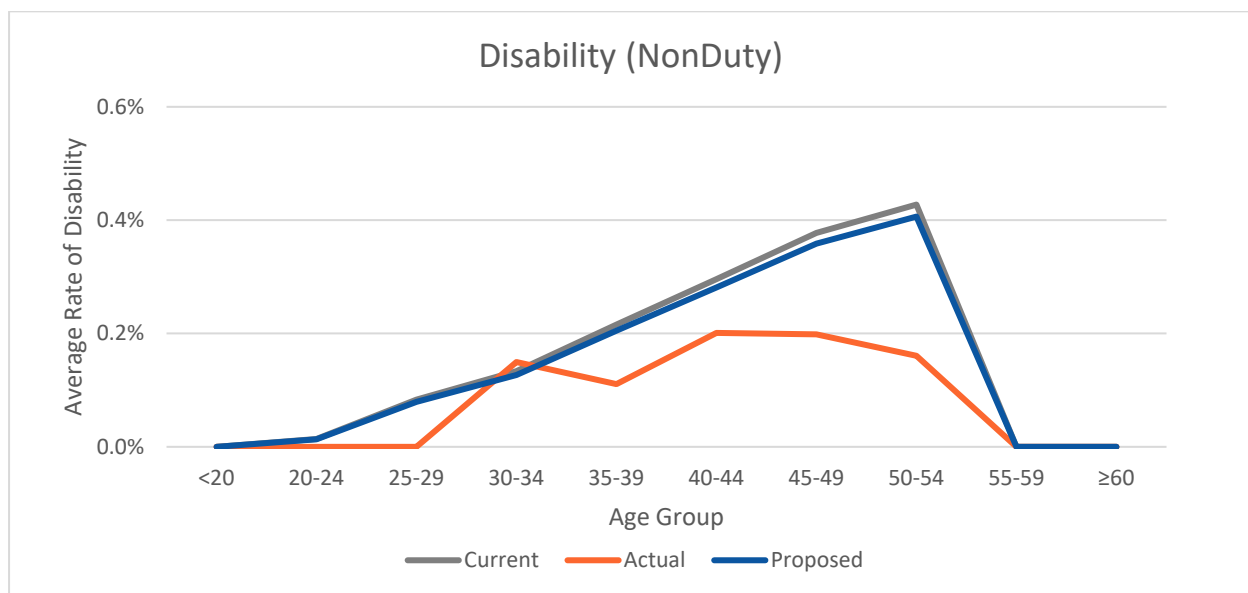
Disability rates generally increase with age. The current assumption is that 50% of all disabilities are duty related and 50% are non-duty related and that 5% of non-duty disabled members receive a 20% reduction in benefits due to gainful employment only through age 65.

Experience from July 1, 2020 through June 30, 2024 are presented on the following pages.

Disability Rates (Duty)						
Age	Exposures	Expected from Current Assumptions	Actual	Actual / Expected	Expected from Proposed Assumptions	Actual / Expected (Proposed Rates)
<20	3	0.0	0	0%	0.0	0%
20-24	233	0.0	0	0%	0.0	0%
25-29	489	0.4	0	0%	0.4	0%
30-34	637	0.9	1	112%	0.8	118%
35-39	862	2.0	2	102%	1.9	108%
40-44	948	2.9	4	136%	2.8	143%
45-49	960	3.8	3	79%	3.6	83%
50-54	593	2.7	2	75%	2.5	79%
55-59	88	0.0	0	0%	0.0	0%
≥60	29	0.0	0	0%	0.0	0%
Totals	4,842	12.7	12	94%	12.1	99%



Disability Rates (Non-Duty)						
Age	Exposures	Expected from Current Assumptions	Actual	Actual / Expected	Expected from Proposed Assumption	Actual / Expected (Proposed Rates)
<20	3	0.0	0	100%	0.0	100%
20-24	233	0.0	0	0%	0.0	0%
25-29	489	0.4	0	0%	0.4	0%
30-34	637	0.9	1	112%	0.8	118%
35-39	862	2.0	1	51%	1.9	54%
40-44	948	2.9	2	68%	2.8	71%
45-49	960	3.8	2	53%	3.6	55%
50-54	593	2.7	1	38%	2.5	40%
55-59	88	0.0	0	100%	0.0	100%
≥60	29	0.0	0	100%	0.0	100%
Totals	4,842	12.7	7	55%	12.1	58%



Overall, the ratio of actual-to-expected disabilities was approximately 75% (19/25) and 63% were duty related.

Recommended Disability Incidence Assumption

We recommend **lowering the combined (duty plus non-duty related) disability rates by 5%** to better align the assumption with recent experience.

Using recent experience to estimate the percentage of expected total disabilities that will be duty related versus non-duty related is difficult due to the small number of actual disabilities over the study period. The previous two experience studies have shown fluctuations in duty-related versus non-duty related disabilities in both directions. Given these historical fluctuations, we recommend continuing the use of the current assumption **(no changes) of 50% duty related and 50% non-duty related.**

Further, given that the plan benefit for non-duty disabilities is partially offset for gainful employment (\$1 for every \$3 of other income above \$18,200 [in 2024; indexed by state minimum wage]), the current valuation assumption for disabilities also includes an additional assumption that 5% of non-duty disabled members receive a 20% reduction in benefits due to gainful employment through age 65. Of all 124 members on non-duty disability in the July 1, 2024 database, 55 were under age 65 on the valuation date and 10 had offsets in the data. In the prior experience study period, only 9 members had gainful employment offsets.

Recommended Non-Duty Disability Gainful Employment Offset Assumption

Given the small sample size and the minimal impact on the valuation results, we suggest continuing the use of the current assumption **(no changes)** that 5% of non-duty disabilities result in a 20% reduction in benefits.

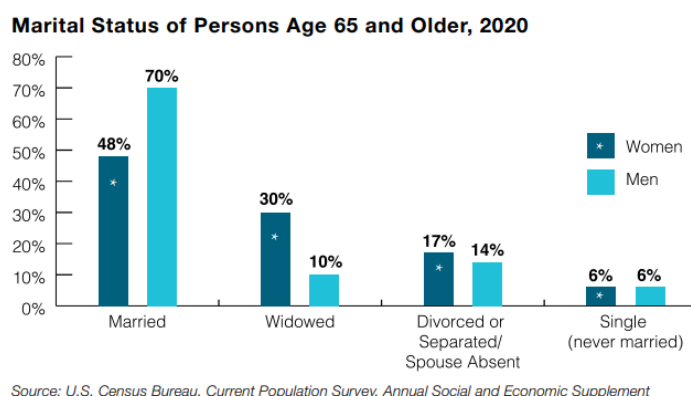
Survivor Benefit Assumptions

Marriage Assumptions

The plan provides the same basic benefit, equal to 60% of the member's accrued benefit⁷, for death both pre- and post- retirement. Currently, the actuarial valuation uses an assumption for the percentage of members who are married (70%) and applies a 6% load to pre-retirement death benefits and a 1% load to post-retirement death benefits to capture expected benefits for non-spouse dependent beneficiaries (children, parents, and siblings).

Nationally, rates of marriage vary by age and have generally decreased over time. One survey⁸ noted in our prior experience study showed that, in 1960, over 80% of men were married by age 30 and the rate stayed above 80% until about age 80. In 2013, only 40% were married by age 30 and the rate never reached 80%. During the retirement ages, the rate eventually declines as spouses die.

A May 2021 report titled *2020 Profile of Older Americans*, which was published by the Administration for Community Living using data from the U.S. Census Bureau, found that 70% of males over age 65 were married in 2020:



⁷ If a member has not reached the age and service eligibility requirements for retirement upon death, then for the purposes of the death benefit, the member is assumed to have been normal retirement eligible such that the member's accrued benefit would have been equal to 60% of average annual compensation.

⁸ American Community Survey from US Department of Commerce (US Census)

We also looked at the number of retirees who died in fiscal years 2021 through 2024 and had a corresponding non-child beneficiary. The results were the following:

- Retiree deaths with a beneficiary/all retiree deaths = $115/226 = 51\%$

Recommended Married Assumption

Based on recent experience and national marriage trends, we recommend **lowering the percentage married assumption from 70% to 65%**. For actives, the marriage assumption is generally applied at the date of decrement, while for retirees, the assumption is generally applied on the valuation date.

We also reviewed the age difference for the spouse beneficiaries of deceased participants and found that, on average, female spouses were about 3-4 years younger than male participants.

Recommended Spouse Age Difference Assumption

We recommend the continued use of **(no changes to)** the current assumption that female spouses are three years younger than male spouses.

Non-Spouse Load Assumption

We also considered the load to provide benefits to dependent, non-spouse beneficiaries. Our understanding is that the benefits paid to those dependent individuals are:

- Child: 20% of the participant's benefit until⁹ the child attains 18 or marries
- Orphaned child: 25% of the participant's benefit until¹⁰ the child attains 18 or marries
- Parent: 10% of the participant's benefit for life
- Sibling: the sum of fifty dollars per month (but a total not to exceed \$100 per month) until such individual attains the age of 18 or marries

There are more details to these provisions (e.g., cap of 100% of member's benefit), but for the purposes of this experience study, the above outlined provisions contain enough detail for our analysis. The benefits to dependent, non-spouse beneficiaries (excluding dependent parents) end at age 18 and the percentage payable to these dependents is less than the 60% paid to a spouse. These benefits are paid in addition to the 60% spousal benefit (i.e. they are additive).

The three benefits which end at age 18 have relatively little cost and are most likely to occur when an employee dies prior to retirement. Depending on when an employee dies and assuming the spouse lives to age 85, the child and sibling benefits would likely be paid for no more than 35% of the time that the spouse benefit would be paid and, in most cases, the non-spouse child or sibling would be over age 18 when the member dies.

Given that the amount of the child benefit¹¹ is often only 33% of the spouse benefit (20%/60%) and the sibling benefit is much less, and considering the length of time these beneficiary benefits would likely be paid, a load of 5% on the value of the spousal pre-retirement death benefits is probably conservative for estimating the value of these benefits for active members.

Using a similar assumption development methodology, a load of 0.5% should be sufficient for post-retirement death benefits due to the older ages at death postretirement, the corresponding

⁹ If the child is disabled, the payment continues beyond age 18 or marriage so long as the child remains disabled.

¹⁰ If the orphaned child is disabled, the payment continues beyond age 18 or marriage so long as the orphaned child remains disabled.

¹¹ We give little value to the dependent brother/sister benefit

older ages of dependent beneficiaries, and, consequently, the shorter payment periods for those child and sibling dependent beneficiaries.

We expect that only a small percentage of parents are legally dependent on their children. The parent benefit is most likely to apply to retirees since that is when most deaths occur and a load for this would need to be less than $10\%/60\% = 16.7\%$ due to the older ages of the parents and the possibility they may predecease the member. We recommend a load of 1.0% for pre-retirement and 0.5% for post-retirement deaths.

Recommended Non-Spouse Load Assumption

We recommend the continued use of **(no changes to)** the current total pre-retirement and post-retirement death benefit loads of 6.0% (5% + 1%) and 1.0% (0.5% + 0.5%), respectively.

Remarriage rate

Our understanding is that spousal benefits end on remarriage. There is no explicit assumption for this purpose. There is some available US Census data¹² but it is not all relevant. For example, for females aged 60-69, approximately:

- 6% were never married
- 61% were married once
- 25% were married twice
- 8% were married three or more times

Many of the marriages would be after divorce and not after the death of a spouse. This also does not tell us the likelihood that a surviving spouse will remarry when there is a pension incentive not to get remarried.

Recommended Remarriage Assumption

We recommend the continued use of **(no changes to)** the current assumption that there are no remarriages after member death.

Timing of Decrements

Currently, decrements (termination, retirement, disability, and death) are assumed to occur mid-year, except for ages at which there is a 100% retirement assumption, in which case retirement is assumed to occur at the beginning of the year. For example, for the 7/1/2025 valuation, the first decrements (other than 100% retirement) would be assumed to occur on 12/31/2025. The timing of when a person leaves during the year is not very material when calculating normal cost and actuarial liabilities for most plans. However, when forecasting short-term cash flow or when valuing small, closed plans, the differences may be noticeable.

Recommended Decrement Timing Assumption

We recommend the continued use of **(no changes to)** the current mid-year timing assumption.

¹² American Community Survey from US Department of Commerce (2020 US Census)

Section V. Impact of Changes

The estimated cost for the changes recommended in this report were developed based on the July 1, 2024 census and asset information. Below is a list of the impact on the actuarial accrued liability, the normal cost, the unfunded actuarial accrued liability, and the funded ratio. The tables that follow on this page present these metrics in total for each of Police, Fire, and Total, while the tables on the pages that follow present the metrics by plan. Note the assumption changes will first take effect for the July 1, 2026 valuation, which will develop the contribution FY 2028.

	Police			
(\$, in millions)	Actuarial Accrued Liability	Total Normal Cost	Unfunded Accrued Liability	Funded Ratio
A. Current Assumptions	754.0	10.1	364.8	51.6%
B. Proposed Assumptions	737.5	9.9	348.3	52.8%
C. Dollar Difference (B. – A.)	(16.5)	(0.3)	(16.5)	1.2%
D. Percentage Difference (B. / A. - 1)	(2.2%)	(2.5%)	(4.5%)	2.2%

	Fire			
(\$, in millions)	Actuarial Accrued Liability	Total Normal Cost	Unfunded Accrued Liability	Funded Ratio
A. Current Assumptions	739.9	11.2	415.4	43.9%
B. Proposed Assumptions	724.2	11.1	399.7	44.8%
C. Dollar Difference (B. – A.)	(15.7)	(0.1)	(15.7)	0.9%
D. Percentage Difference (B. / A. - 1)	(2.1%)	(0.8%)	(3.8%)	2.2%

	Total			
(\$, in millions)	Actuarial Accrued Liability	Total Normal Cost	Unfunded Accrued Liability	Funded Ratio
A. Current Assumptions	1,493.9	21.3	780.2	47.8%
B. Proposed Assumptions	1,461.7	21.0	748.0	48.8%
C. Dollar Difference (B. – A.)	(32.2)	(0.4)	(32.2)	1.1%
D. Percentage Difference (B. / A. - 1)	(2.2%)	(1.6%)	(4.1%)	2.2%

Results by Plan

Plan	Assets	Current Assumptions					Proposed Assumptions				
		Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio	Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio
Beckley Fire	25,336,825	6.25%	44,248,593	597,564	18,911,768	57%	6.25%	43,221,350	587,917	17,884,525	59%
Beckley Police	31,778,279	6.25%	42,773,738	547,108	10,995,459	74%	6.25%	42,000,048	527,995	10,221,769	76%
Belle Police	1,520,245	7.00%	1,217,723	-	(302,522)	125%	7.00%	1,147,933	-	(372,312)	132%
Bluefield Fire	5,267,356	5.00%	18,317,763	222,439	13,050,407	29%	5.00%	17,945,722	220,913	12,678,366	29%
Bluefield Police	10,068,656	6.25%	15,685,581	250,484	5,616,925	64%	6.25%	15,329,253	239,254	5,260,597	66%
Charles Town Police	555,540	5.75%	1,035,841	1,135	480,301	54%	5.75%	968,273	1,135	412,733	57%
Charleston Fire	56,697,857	7.00%	156,800,690	831,402	100,102,833	36%	7.00%	153,950,915	828,187	97,253,058	37%
Charleston Police	60,037,045	7.00%	152,811,269	839,108	92,774,224	39%	7.00%	149,766,720	807,249	89,729,675	40%
Chester Police	2,130,962	7.00%	2,274,982	15,450	144,020	94%	7.00%	2,211,662	15,107	80,700	96%
Clarksburg Fire	18,312,289	6.25%	36,216,808	496,078	17,904,519	51%	6.25%	35,441,604	484,859	17,129,315	52%
Clarksburg Police	17,484,724	6.25%	28,317,776	372,709	10,833,052	62%	6.25%	27,638,500	358,919	10,153,776	63%
Dunbar Fire	2,844,162	7.00%	12,002,404	99,035	9,158,242	24%	7.00%	11,794,990	98,660	8,950,828	24%
Dunbar Police	6,897,748	7.00%	7,368,929	31,862	471,181	94%	7.00%	7,264,707	30,748	366,959	95%
Elkins Fire	2,754,268	6.25%	2,069,856	34,155	(684,412)	133%	6.25%	2,031,978	33,977	(722,290)	136%
Elkins Police	4,468,123	6.25%	4,527,953	21,541	59,830	99%	6.25%	4,334,303	20,867	(133,820)	103%
Fairmont Fire	8,921,761	7.00%	37,859,312	338,368	28,937,551	24%	7.00%	37,105,246	333,294	28,183,485	24%
Fairmont Police	12,272,992	6.25%	26,091,321	148,050	13,818,329	47%	6.25%	25,406,804	143,101	13,133,812	48%
Grafton Fire	2,054,065	6.00%	2,180,388	1,197	126,323	94%	6.00%	2,137,364	1,197	83,299	96%
Grafton Police	2,066,658	6.00%	1,711,145	3,656	(355,513)	121%	6.00%	1,714,465	3,656	(352,193)	121%
Huntington Fire	43,574,959	6.50%	98,587,309	606,207	55,012,350	44%	6.50%	96,175,627	601,852	52,600,668	45%
Huntington Police	51,534,906	6.50%	102,978,771	415,776	51,443,865	50%	6.50%	100,332,298	403,328	48,797,392	51%
Logan Fire	2,580,371	6.50%	3,151,759	104,965	571,388	82%	6.50%	3,138,902	104,214	558,531	82%
Logan Police	1,942,889	6.50%	2,672,553	35,173	729,664	73%	6.50%	2,627,907	33,583	685,018	74%
Martinsburg Fire	4,920,030	7.00%	31,067,355	448,904	26,147,325	16%	7.00%	30,522,818	447,183	25,602,788	16%
Martinsburg Police	11,124,214	7.00%	36,708,027	447,787	25,583,813	30%	7.00%	36,018,991	428,599	24,894,777	31%
Morgantown Fire	15,609,552	6.50%	46,903,215	899,384	31,293,663	33%	6.50%	45,866,958	895,205	30,257,406	34%
Morgantown Police	18,443,722	6.50%	61,981,940	650,463	43,538,218	30%	6.50%	60,745,083	624,987	42,301,361	30%
Moundsville Fire	1,781,767	6.50%	2,933,103	38,672	1,151,336	61%	6.50%	2,806,936	38,540	1,025,169	63%
Moundsville Police	6,330,032	6.50%	8,800,272	59,536	2,470,240	72%	6.50%	8,536,787	57,710	2,206,755	74%
Nitro Fire	3,162,369	4.75%	12,870,346	347,726	9,707,977	25%	4.75%	12,747,795	342,849	9,585,426	25%
Nitro Police	6,249,097	5.00%	15,932,833	347,830	9,683,736	39%	5.00%	15,733,034	334,972	9,483,937	40%
Oak Hill Police	5,231,137	6.25%	4,853,033	36,031	(378,104)	108%	6.25%	4,782,892	35,020	(448,245)	109%
Parkersburg Fire	29,109,042	6.50%	55,655,476	379,451	26,546,434	52%	6.50%	54,360,466	376,841	25,251,424	54%
Parkersburg Police	28,040,722	6.50%	53,550,747	338,895	25,510,025	52%	6.50%	52,399,248	325,767	24,358,526	54%
Point Pleasant Police	3,315,117	7.00%	4,334,889	23,547	1,019,772	76%	7.00%	4,241,298	23,398	926,181	78%

Plan	Assets	Current Assumptions					Proposed Assumptions				
		Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio	Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio
Princeton Fire	3,162,418	4.25%	14,000,089	315,043	10,837,671	23%	4.25%	13,672,313	311,415	10,509,895	23%
Princeton Police	5,811,188	5.50%	13,723,282	262,729	7,912,094	42%	5.50%	13,481,585	253,458	7,670,397	43%
South Charleston Fire	5,543,852	4.25%	46,238,185	1,217,741	40,694,333	12%	4.25%	45,349,877	1,197,546	39,806,025	12%
South Charleston Police	4,984,388	4.25%	36,806,435	973,117	31,822,047	14%	4.25%	36,063,104	936,074	31,078,716	14%
St. Albans Fire	2,785,935	4.25%	23,980,528	537,170	21,194,593	12%	4.25%	23,417,177	531,516	20,631,242	12%
St. Albans Police	8,946,645	6.25%	17,296,120	263,215	8,349,475	52%	6.25%	16,872,799	251,574	7,926,154	53%
Star City Police	2,396,812	6.50%	2,123,902	21,787	(272,910)	113%	6.50%	2,059,424	20,887	(337,388)	116%
Vienna Police	12,993,811	6.50%	16,085,151	181,210	3,091,340	81%	6.50%	15,962,292	174,794	2,968,481	81%
Weirton Fire	16,217,707	6.50%	18,170,555	300,568	1,952,848	89%	6.50%	17,821,049	298,942	1,603,342	91%
Weirton Police	13,421,836	6.25%	33,579,105	263,032	20,157,269	40%	6.25%	32,667,157	253,349	19,245,321	41%
Welch Police	3,860,909	6.50%	1,935,528	20,675	(1,925,381)	199%	6.50%	1,885,618	19,815	(1,975,291)	205%
Weston Fire	1,699,792	6.25%	2,116,293	32,609	416,501	80%	6.25%	2,067,996	32,414	368,204	82%
Weston Police	1,834,321	6.25%	1,352,562	7,055	(481,759)	136%	6.25%	1,318,364	6,761	(515,957)	139%
Westover Police	3,196,788	6.50%	3,039,814	23,142	(156,974)	105%	6.50%	2,950,065	22,188	(246,723)	108%
Wheeling Fire	69,717,986	7.00%	71,193,165	485,210	1,475,179	98%	7.00%	69,357,646	478,350	(360,340)	101%
Wheeling Police	48,380,582	7.00%	49,930,594	229,809	1,550,012	97%	7.00%	48,641,937	221,882	261,355	99%
Williamson Fire	2,464,302	7.00%	3,357,193	15,250	892,891	73%	7.00%	3,302,871	15,142	838,569	75%
Williamson Police	1,873,656	7.00%	2,451,774	10,976	578,118	76%	7.00%	2,377,362	10,417	503,706	79%

Difference by Plan

Plan	Assets	Difference (Proposed - Current) in Dollars					Difference (Proposed - Current) as a Percentage				
		Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio	Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio
Beckley Fire	N/A	N/A	(1,027,243)	(9,647)	(1,027,243)	N/A	0.00%	-2.3%	-1.6%	-5.4%	1.36%
Beckley Police	N/A	N/A	(773,690)	(19,113)	(773,690)	N/A	0.00%	-1.8%	-3.5%	-7.0%	1.37%
Belle Police	N/A	N/A	(69,790)	-	(69,790)	N/A	0.00%	-5.7%	#DIV/0!	23.1%	7.59%
Bluefield Fire	N/A	N/A	(372,041)	(1,526)	(372,041)	N/A	0.00%	-2.0%	-0.7%	-2.9%	0.59%
Bluefield Police	N/A	N/A	(356,328)	(11,230)	(356,328)	N/A	0.00%	-2.3%	-4.5%	-6.3%	1.49%
Charles Town Police	N/A	N/A	(67,568)	-	(67,568)	N/A	0.00%	-6.5%	0.0%	-14.1%	3.74%
Charleston Fire	N/A	N/A	(2,849,775)	(3,215)	(2,849,775)	N/A	0.00%	-1.8%	-0.4%	-2.8%	0.67%
Charleston Police	N/A	N/A	(3,044,549)	(31,859)	(3,044,549)	N/A	0.00%	-2.0%	-3.8%	-3.3%	0.80%
Chester Police	N/A	N/A	(63,320)	(343)	(63,320)	N/A	0.00%	-2.8%	-2.2%	-44.0%	2.68%
Clarksburg Fire	N/A	N/A	(775,204)	(11,219)	(775,204)	N/A	0.00%	-2.1%	-2.3%	-4.3%	1.11%
Clarksburg Police	N/A	N/A	(679,276)	(13,790)	(679,276)	N/A	0.00%	-2.4%	-3.7%	-6.3%	1.52%
Dunbar Fire	N/A	N/A	(207,414)	(375)	(207,414)	N/A	0.00%	-1.7%	-0.4%	-2.3%	0.41%
Dunbar Police	N/A	N/A	(104,222)	(1,114)	(104,222)	N/A	0.00%	-1.4%	-3.5%	-22.1%	1.34%
Elkins Fire	N/A	N/A	(37,878)	(178)	(37,878)	N/A	0.00%	-1.8%	-0.5%	5.5%	2.48%
Elkins Police	N/A	N/A	(193,650)	(674)	(193,650)	N/A	0.00%	-4.3%	-3.1%	-323.7%	4.41%
Fairmont Fire	N/A	N/A	(754,066)	(5,074)	(754,066)	N/A	0.00%	-2.0%	-1.5%	-2.6%	0.47%
Fairmont Police	N/A	N/A	(684,517)	(4,949)	(684,517)	N/A	0.00%	-2.6%	-3.3%	-5.0%	1.27%
Grafton Fire	N/A	N/A	(43,024)	-	(43,024)	N/A	0.00%	-2.0%	0.0%	-34.1%	1.89%
Grafton Police	N/A	N/A	3,320	-	3,320	N/A	0.00%	0.2%	0.0%	-0.9%	-0.24%
Huntington Fire	N/A	N/A	(2,411,682)	(4,355)	(2,411,682)	N/A	0.00%	-2.4%	-0.7%	-4.4%	1.11%
Huntington Police	N/A	N/A	(2,646,473)	(12,448)	(2,646,473)	N/A	0.00%	-2.6%	-3.0%	-5.1%	1.32%
Logan Fire	N/A	N/A	(12,857)	(751)	(12,857)	N/A	0.00%	-0.4%	-0.7%	-2.3%	0.34%
Logan Police	N/A	N/A	(44,646)	(1,590)	(44,646)	N/A	0.00%	-1.7%	-4.5%	-6.1%	1.23%
Martinsburg Fire	N/A	N/A	(544,537)	(1,721)	(544,537)	N/A	0.00%	-1.8%	-0.4%	-2.1%	0.28%
Martinsburg Police	N/A	N/A	(689,036)	(19,188)	(689,036)	N/A	0.00%	-1.9%	-4.3%	-2.7%	0.58%
Morgantown Fire	N/A	N/A	(1,036,257)	(4,179)	(1,036,257)	N/A	0.00%	-2.2%	-0.5%	-3.3%	0.75%
Morgantown Police	N/A	N/A	(1,236,857)	(25,476)	(1,236,857)	N/A	0.00%	-2.0%	-3.9%	-2.8%	0.60%
Moundsville Fire	N/A	N/A	(126,167)	(132)	(126,167)	N/A	0.00%	-4.3%	-0.3%	-11.0%	2.73%
Moundsville Police	N/A	N/A	(263,485)	(1,826)	(263,485)	N/A	0.00%	-3.0%	-3.1%	-10.7%	2.22%
Nitro Fire	N/A	N/A	(122,551)	(4,877)	(122,551)	N/A	0.00%	-1.0%	-1.4%	-1.3%	0.24%
Nitro Police	N/A	N/A	(199,799)	(12,858)	(199,799)	N/A	0.00%	-1.3%	-3.7%	-2.1%	0.50%
Oak Hill Police	N/A	N/A	(70,141)	(1,011)	(70,141)	N/A	0.00%	-1.4%	-2.8%	18.6%	1.58%
Parkersburg Fire	N/A	N/A	(1,295,010)	(2,610)	(1,295,010)	N/A	0.00%	-2.3%	-0.7%	-4.9%	1.25%
Parkersburg Police	N/A	N/A	(1,151,499)	(13,128)	(1,151,499)	N/A	0.00%	-2.2%	-3.9%	-4.5%	1.15%
Point Pleasant Police	N/A	N/A	(93,591)	(149)	(93,591)	N/A	0.00%	-2.2%	-0.6%	-9.2%	1.68%

Plan	Assets	Difference (Proposed - Current) in Dollars					Difference (Proposed - Current) as a Percentage				
		Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio	Discount Rate	Actuarial Accrued Liability	Employer Normal Cost	Unfunded Accrued Liability	Funded Ratio
Princeton Fire	N/A	N/A	(327,776)	(3,628)	(327,776)	N/A	0.00%	-2.3%	-1.2%	-3.0%	0.54%
Princeton Police	N/A	N/A	(241,697)	(9,271)	(241,697)	N/A	0.00%	-1.8%	-3.5%	-3.1%	0.75%
South Charleston Fire	N/A	N/A	(888,308)	(20,195)	(888,308)	N/A	0.00%	-1.9%	-1.7%	-2.2%	0.23%
South Charleston Police	N/A	N/A	(743,331)	(37,043)	(743,331)	N/A	0.00%	-2.0%	-3.8%	-2.3%	0.28%
St. Albans Fire	N/A	N/A	(563,351)	(5,654)	(563,351)	N/A	0.00%	-2.3%	-1.1%	-2.7%	0.28%
St. Albans Police	N/A	N/A	(423,321)	(11,641)	(423,321)	N/A	0.00%	-2.4%	-4.4%	-5.1%	1.29%
Star City Police	N/A	N/A	(64,478)	(900)	(64,478)	N/A	0.00%	-3.0%	-4.1%	23.6%	3.53%
Vienna Police	N/A	N/A	(122,859)	(6,416)	(122,859)	N/A	0.00%	-0.8%	-3.5%	-4.0%	0.62%
Weirton Fire	N/A	N/A	(349,506)	(1,626)	(349,506)	N/A	0.00%	-1.9%	-0.5%	-17.9%	1.75%
Weirton Police	N/A	N/A	(911,948)	(9,683)	(911,948)	N/A	0.00%	-2.7%	-3.7%	-4.5%	1.12%
Welch Police	N/A	N/A	(49,910)	(860)	(49,910)	N/A	0.00%	-2.6%	-4.2%	2.6%	5.28%
Weston Fire	N/A	N/A	(48,297)	(195)	(48,297)	N/A	0.00%	-2.3%	-0.6%	-11.6%	1.88%
Weston Police	N/A	N/A	(34,198)	(294)	(34,198)	N/A	0.00%	-2.5%	-4.2%	7.1%	3.52%
Westover Police	N/A	N/A	(89,749)	(954)	(89,749)	N/A	0.00%	-3.0%	-4.1%	57.2%	3.20%
Wheeling Fire	N/A	N/A	(1,835,519)	(6,860)	(1,835,519)	N/A	0.00%	-2.6%	-1.4%	-124.4%	2.59%
Wheeling Police	N/A	N/A	(1,288,657)	(7,927)	(1,288,657)	N/A	0.00%	-2.6%	-3.4%	-83.1%	2.56%
Williamson Fire	N/A	N/A	(54,322)	(108)	(54,322)	N/A	0.00%	-1.6%	-0.7%	-6.1%	1.21%
Williamson Police	N/A	N/A	(74,412)	(559)	(74,412)	N/A	0.00%	-3.0%	-5.1%	-12.9%	2.39%

Section VI. Data, Methods and Assumptions Applied in the Experience Study

We used participant data initially prepared for the actuarial valuations for the years beginning:

- July 1, 2020
- July 1, 2021
- July 1, 2022
- July 1, 2023
- July 1, 2024

We determined, for each year, the actual incidence of each demographic assumption, based on the participant's age nearest birthday and years of service as of the beginning of the year and compared that to the expected incidence, determined using the same factors.