



**Municipal Pensions
Oversight Board**

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

Consolidated Actuarial Valuation Report for the
Year Beginning July 1, 2019

Bolton

Submitted by:

James E. Ritchie, ASA, EA, FCA, MAAA
Senior Consulting Actuary
443.573.3924
jritchie@boltonusa.com

Jordan McClane, FSA, EA, FCA, MAAA
Actuary
667.218.6935
jmcclane@boltonusa.com



Employee Benefits, Actuarial & Investment Consulting

October 26, 2020

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

Re: Consolidated Actuarial Valuation Report for the Year Beginning July 1, 2019

Dear Mr. Taylor:

The purpose of this report is to provide the West Virginia Legislature's Joint Committee on Pensions and Retirement a summary of the results of the actuarial valuations for the 53 municipal policemen's and firemen's pension and relief funds.

Section I provides an executive summary of the key results of the 53 actuarial valuations. Section II provides background on the discount rate used to value liabilities and the rate used by each plan. Section III provides details of the valuation results for each plan and for all plans by funding policy, the development of the total gains and losses on liabilities and plan assets, and a summary of the combined assets for all the plans. Section IV provides a description of the requirements to receive the premium tax and COLA as well as the plans impacted by the solvency tests. Section V provides a description of the analysis provided in the individual reports regarding changes in funding policies. Section VI provides information regarding plans that adopted a Deferred Retirement Option Plan (DROP). Section VII provides some conclusions and recommendations. Sections VIII through X provide a summary of the census data, plan provisions, actuarial methods and assumptions. Section XI provides a glossary of many of the terms used in this report.

The purposes of an actuarial valuation for each municipal pension and relief fund is to provide information on:

- The municipality's funding requirements for the fiscal year ending June 30, 2021, based on the selected funding policy
- The plan's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2021
- The plan's eligibility to provide supplemental benefits for the plan year beginning July 1, 2021
- For plans that can change their funding policy, current and projected contribution requirements and funded status under other available funding policies.

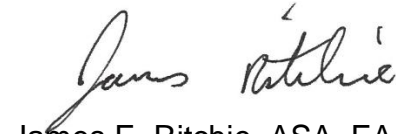
This report may not be used for any other purpose; Bolton is not responsible for the consequences of any unauthorized use.

Bolton

Employee Benefits, Actuarial & Investment Consulting

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate.

Respectfully submitted,



James E. Ritchie, ASA, EA, FCA, MAAA



Jordan McClane, FSA, EA, FCA, MAAA



Table of Contents

	Page
Contents	
Section I. Executive Summary	6
Background.....	6
Summary of Results.....	6
Experience Analysis.....	8
Commentary on Actuarial Health of Plans	8
Alternative Funding Policy	9
Projected Funded Status	10
Premium Tax and Supplemental Benefit (COLA) Eligibility.....	10
Changes in Funding Policy	11
Deferred Retirement Option Plans (DROPs)	11
Changes in Methods, Assumptions, and Plan Amendments	12
Special Funding Situations	12
Summary of Plan Statistics	13
Section II. Discount Rate	14
Discount Rate Distribution	14
Changes in Discount Rate	15
Section III. Actuarial Valuation Results	16
Key Valuation Results by Funding Policy.....	16
Key Valuation Results by Municipality	18
Experience (Gain)/Loss for Plan Year Ended June 30, 2019.....	27
Reconciliation of Assets.....	28
Asset Allocation	29
Section IV. Solvency Tests for Premium Tax and COLA	30
Premium Tax Eligibility.....	30
Supplemental Benefit (COLA) Eligibility	30
Solvency Tests	31
Plans Impacted by Solvency Tests	31
Section V. Funding Policy Choices	32
Background.....	32



Optional Funding Policy	32
Conservation Funding Policy	34
Section VI. Deferred Retirement Option Plans (DROPS)	36
Post-implementation DROP Analysis.....	36
Section VII. Conclusions and Recommendations	39
Conclusions	39
Recommendations	39
Section VIII. Participant Information	41
Participant Summary.....	41
Active Age/Service Distribution Including Compensation.....	42
Section IX. Summary of Plan Provisions	43
Section X. Actuarial Methods and Assumptions	46
Section XI. Glossary	53



Section I. Executive Summary

Background

Bolton has prepared a July 1, 2019 actuarial valuation for each of the 53 municipal policemen’s and firemen’s pension and relief funds (plans) that fall under the oversight of the Municipal Pension Oversight Board (MPOB). The actuarial valuations were prepared in accordance with West Virginia Code §8-22-20 and §8-22-20a. This report summarizes the results of the 53 actuarial valuations and the requirements of those valuations are included by reference in this report.

The results for the valuations were generated using both proprietary and third-party models (including software and tools). We have tested these models to ensure they are used for their intended purposes, within their known limitations, and without any known material inconsistencies unless otherwise stated.

Please note that results provided for valuation dates prior to July 1, 2018 and for contributions for fiscal years prior to 2020 were prepared by the prior actuary, Gabriel Roeder Smith & Company (GRS). Bolton does not assume the responsibility for the accuracy of GRS’s results shown in this report.

Additionally, please note that some columns and rows in the tables presented throughout this report may not add due to rounding.

Summary of Results

The following table presents a five-year summary of the total estimated pension contributions for all 53 pension plans.

(\$ in millions)	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021
Employee Contributions	\$ 6.1	\$ 6.2	\$ 6.2	\$ 6.3	\$ 6.3
Net City Contributions	\$ 46.7	\$ 51.9	\$ 50.1	\$ 52.5	\$ 52.7
Premium Tax Allocation	\$ 17.7	\$ 18.2	\$ 18.5	\$ 19.6	\$ 20.0
Total Contribution	\$ 70.5	\$ 76.3	\$ 74.8	\$ 78.4	\$ 79.0

The following table presents a five-year summary of the total liabilities, assets, and funded status for all 53 pension plans.

(\$ in millions)	July 1, 2015	July 1, 2016	July 1, 2017	July 1, 2018	July 1, 2019
Accrued Liability	\$ 1,481.5	\$ 1,503.8	\$ 1,514.8	\$ 1,572.8	\$ 1,605.6
Actuarial Asset Value (Market Value)	\$ 321.2	\$ 329.4	\$ 369.9	\$ 407.2	\$ 444.6
Unfunded Accrued Liability	\$ 1,263.3	\$ 1,174.4	\$ 1,144.9	\$ 1,165.5	\$ 1,161.0
Funding Percentage	22%	22%	24%	26%	28%



The following table presents a five-year summary of the aggregated payments towards the total unfunded liability for all 53 pension plans.

(\$ in millions)	FYE 2017	FYE 2018	FYE 2019	FYE 2020	FYE 2021
1. Normal Cost with Interest	\$ 37.5	\$ 37.7	\$ 37.4	\$ 36.7	\$ 35.3
2. Employee Contributions	\$ 6.1	\$ 6.2	\$ 6.2	\$ 6.3	\$ 6.3
3. Net Normal Cost with Interest (1. - 2.)	\$ 31.4	\$ 31.5	\$ 31.2	\$ 30.3	\$ 29.0
4. Net Normal Cost as a % of Payroll	41%	41%	41%	38%	37%
5. Employer Contribution plus State Premium Tax	\$ 64.4	\$ 70.1	\$ 68.6	\$ 72.0	\$ 72.7
6. Unfunded Liability	\$ 1,263.3	\$ 1,174.4	\$ 1,144.9	\$ 1,165.5	\$ 1,161.0
7. Net Payment Toward Unfunded Liability (5. - 3.)	33.0	38.6	37.4	41.7	43.8
8. Percent of Unfunded Liability Expected to be Paid (7. / 6.)	2.6%	3.2%	3.3%	3.6%	3.8%

The following table presents the dollar-weighted average funded status since 2012 for the 53 plans by funding policy.

Funded Ratio	Standard Policy Plans		Optional Policy Plans from Standard		Optional Policy Plans from Alternative		Alternative Policy Plans		Conservation Policy Plans		
	Year	No.	Average	No.	Average	No.	Average	No.	Average	No.	Average
	2019	4	68%	11	84%	15	37%	18	27%	5	12%
	2018	4	68%	11	80%	15	33%	18	26%	5	12%
	2017	5	65%	10	75%	14	32%	20	24%	4	11%
	2016	5	59%	10	69%	11	30%	25	21%	2	9%
	2015	5	62%	10	67%	10	28%	26	22%	2	9%
	2014	5	67%	10	71%	8	29%	28	26%	2	9%
	2013	8	55%	7	70%	5	23%	31	25%	2	8%
	2012	8	47%	7	63%	5	20%	31	23%	2	7%

The table on the following page presents the dollar-weighted average net employer contribution (excluding the state premium tax allocation) as a percentage of payroll since 2012 for the 53 plans by funding policy.

Employer Contribution Rate	Standard Policy Plans		Optional Policy Plans from Standard		Optional Policy Plans from Alternative		Alternative Policy Plans		Conservation Policy Plans	
	FYE	No.	Average	No.	Average	No.	Average	No.	Average	No.
2021	4	45%	11	48%	15	100%	18	33%	5	99%
2020	4	41%	11	55%	15	102%	18	32%	5	87%
2019	4	41%	10	60%	14	106%	20	31%	4	85%
2018	4	47%	10	71%	14	111%	20	31%	4	87%
2017	4	37%	10	63%	11	106%	25	37%	2	85%
2016	4	28%	10	49%	10	86%	26	35%	2	73%
2015	4	36%	10	43%	8	88%	28	34%	2	67%
2014	7	47%	7	44%	5	101%	31	36%	2	53%
2013	7	42%	7	36%	5	95%	31	33%	2	50%

Experience Analysis

The plans collectively experienced a net actuarial loss of \$5.9 million which comprises a loss on liabilities of \$8.8 million (0.5% of liabilities) and a gain on assets of \$2.8 million (0.6% of assets). The following were the primary causes of the gains and/or losses:

- Demographic changes contributed to the gains and losses in liabilities
- The weighted average return on assets was 5.92% compared to the weighted average (by BOY asset value) discount rate of 5.35% resulting in a slight gain on assets

Offsetting the loss was a \$22.6 million (1.4% of liabilities) decrease in liabilities due to changes in the discount rate. All ten plans that experienced a discount rate change had increases in their discount rates resulting in decreases to the liabilities.

Commentary on Actuarial Health of Plans

The total funded status of all plans combined is 28%. The funded status for each individual plan ranges from 7% (Dunbar Fire) to 122% (Welch Police). Plans that use the Conservation policy have the lowest funded ratio – a dollar-weighted average ratio of 12%. The second lowest funded ratios are plans that use the Alternative funding policy – a dollar-weighted average funded ratio of 27%. Both of these funding policies result in contribution requirements that are expected to increase over time and are likely to increase at a higher rate than the municipalities' revenues. The average annual expected increase in the employer contribution over the next 10 years for municipalities that use the conservation policy is approximately 4% and the average annual increase for municipalities that use the alternative policy is 7%. If a municipality's revenues increase by a smaller percentage than these increases, the pension contributions will continue to become a larger percentage of the overall budget. Municipalities using either one of these methods run the risk of not being able to make the policy contributions in the future. If the municipality cannot sustain the future contribution amounts, the pension plans will eventually become insolvent, meaning that benefits may potentially not get paid.

Plans that use the Optional and Standard policies are better funded. The dollar-weighted average funded ratio for plans that use the Optional from Alternative policy is 37%. The dollar-weighted average funded ratio for plans that use the Optional from Standard policy or currently use the Standard policy is 84% and 68%, respectively. In addition, these plans are expected to experience a level or decreasing contribution as a percentage of payroll in the future and the contribution requirements for these plans are less likely to increase as a percentage of each municipality's revenue than under the Alternative or Conservation policies.

Alternative Funding Policy

The Alternative funding policy does not adhere to actuarial principles generally considered necessary to be classified as a reasonable funding method. The primary challenge associated with the Alternative funding policy is that contributions will most likely increase at a much faster rate than payroll or municipality revenues. This will result in the pension plan being a larger percentage of the city’s budget each year and could grow to an unsustainable level. The catastrophic result will be that the municipalities may at some point in the future be unable to pay the benefits promised to plan members.

The goal of a funding method that adheres to actuarial principles is to fund benefits for members while they are active employees such that their benefits are fully funded by the time they retire.

This results in matching the cost of the members’ benefits to the service they provide the municipality. An additional goal is to fund these benefits over the member’s career as either a level dollar amount or a level percentage of pay. Most public safety plans are funded as a level percentage of pay. This goal is achieved by determining the contribution in two pieces. The first piece is the normal cost, which represents the cost of the member earning an additional year of benefit accrual. The second piece is the amortization of the unfunded liability, which funds any shortfall in assets compared to plan liabilities. If an employer is not funding at least the normal cost plus interest on the unfunded liability, then the unfunded liability will continue to grow, and the plan will likely become insolvent in the future. Most actuarial guidance recommends that an actuarially sound contribution policy pay for the sum of the annual normal cost and an amortization of the unfunded liability over a period of no more than 20 to 25 years.

The following table shows a distribution of the 18 plans that use the Alternative policy segregated by whether their contributions cover the normal cost, the normal cost plus interest on the unfunded actuarial liability (UAL), and if the contributions cover the normal cost plus the interest on the unfunded actuarial liability, the table shows the number of years their current contribution level would take to pay off the unfunded actuarial liability, assuming all assumptions were met.

Amount Covered by Current Contribution	Number of Plans
Less than the Normal Cost	2
More than the Normal Cost but does not cover the interest on the UAL	15
Pays off UAL in more than 70 years	0
Pays off UAL in 60 to 69 years	0
Pays off UAL in 50 to 59 years	0
Pays off UAL in less than 50 years	1

Projected Funded Status

The following chart shows the percentage of plans by funding policy that are projected to be 100% funded by 2031*.

Years	Percentage of Plans Projected to be 100% Funded by 2031*				
	Standard	Optional from Standard	Optional from Alternative	Alternative	Conservation
2019	100%	100%	7%	0%	0%
2018	100%	100%	7%	0%	0%
2017	100%	100%	7%	0%	0%
2016	100%	100%	0%	4%	0%
2015	100%	100%	0%	4%	0%
2014	100%	100%	13%	18%	0%
2013	100%	100%	0%	19%	0%
2012	100%	100%	0%	10%	0%
2011	100%	100%	20%	10%	0%

* Be design, plans using the Standard and Optional from Standard funding policies generally are assumed to reach full funding sooner than plans using other funding policies. Although the amortization period for Standard and Optional from Standard funding policies is linked to 2031, contributions are made in the fiscal year following the fiscal year beginning on the valuation date. As such, all percentages listed in the table represent the percentage of plans anticipated to be 100% funded by fiscal year end 2032.

Premium Tax and Supplemental Benefit (COLA) Eligibility

West Virginia Code §8-22-20 has been historically interpreted to require plans that use the Alternative funding policy to be projected to be solvent in the next 15 years in order to receive the State premium tax allocation. West Virginia Code §8-22-26a requires the actuary to certify that the minimum funding for actuarial soundness will be preserved if a COLA is granted for the year. The MPOB has interpreted this provision to mean that if a plan is projected to be solvent in the next 15 years, the COLA must be granted.

Plans that use the Standard, Optional, and Conservation funding policies will always be projected to be solvent in the next 15 years as long as these plans are assumed to make the required contribution under the respective funding policy. The solvency test applied to Alternative policy plans is that a plan's assets must be projected to be above \$0 for the next 15 years. This projection is done on an open group basis for the premium tax allocation and closed group basis for granting the COLA. The rationale for using an open group basis for the premium tax and a closed group basis for the COLA is that the open group projection is an easier threshold to meet compared to the closed group test. Since the premium tax helps improve the funded status of the plan and the COLA increases the liabilities for the plan, the easier test should apply to the event that improves the funded status and the harder test should apply to the event that lowers the funded status of the plan.

No plans are required to make additional contributions for FYE 2021 to meet either one of the solvency tests.

Changes in Funding Policy

Plans that use the Alternative funding policy may change to the Conservation or Optional funding policies. Plans that use the Standard funding policy may change to the Optional funding policy. The individual actuarial valuations provide projections for plans that use the Alternative funding policy that show the impact of switching to the Conservation or Optional funding policies in the next plan year or at a time in the future that may be fiscally advantageous for the plan to switch to either method.

The Alternative and Conservation funding policies do not follow actuarial principles for a reasonable funding method. The challenge with each of these funding policies is that the contributions are generally expected to increase at a greater rate than payroll and municipality revenues, which will result in an increased burden to municipalities in the future. At some point, the municipalities may not be able to pay all of the benefits due from the plan. **We recommend that municipalities be encouraged to move to a more actuarially sound basis as soon as possible.**

No plans made changes to their funding policies this past fiscal year.

Deferred Retirement Option Plans (DROPs)

Three plans have implemented a DROP. The three plans are Wheeling Fire, St. Albans Fire, and St. Albans Police. Wheeling Fire and St. Albans Fire currently have participants participating in DROP. St. Albans Police only had one person elect DROP and he is currently retired.

West Virginia Code Section §8-22-25a(e) requires the MPOB to annually report to the Legislature's Joint Committee on Pensions and Retirement the status of any DROP that has been approved, including any experience impact on an affected pension and relief fund. Bolton provided a letter to the MPOB on September 2, 2020 with the results of this analysis. The following table summarizes the results:

Fund	Cost/(Savings)
St. Albans Fire	\$128,943
Wheeling Fire	(\$884,257)

The Wheeling Firemen's plan uses the Optional funding policy, whereas the St. Albans Fire and Police plans use the Alternative funding policy. Plans that adopt a DROP and use the Optional funding policy are required under WV Code §8-22-25a(d)(1) to continue to contribute the normal cost for members in DROP. Plans using the Alternative funding policy are not required to contribute the normal cost for members in DROP. The contribution of the additional normal cost for DROP members under the Optional funding policy created the savings for the Wheeling Fire plan compared to St. Albans Fire and Police plans which had costs due to the DROP.

This analysis is based on DROPs in effect as of July 1, 2019. Since July 1, 2019, Beckley Fire has proposed a new DROP, which was approved by the MPOB on September 19, 2019. The Beckley Fire DROP is expected to produce a savings of \$2.25 million. However, the DROP cost is highly sensitive to certain assumptions and using a reasonable set of alternative assumptions could result in an expected cost of approximately \$0.13 million.

Beckley Police also proposed a new DROP, which was approved by the MPOB on June 18, 2020. The Beckley Police DROP is expected to produce a savings of \$1.14 million. However, similar to the Beckley Fire analysis, the DROP cost is highly sensitive to certain assumptions

and using a reasonable set of alternative assumptions could result in a cost of approximately \$0.10 million.

Changes in Methods, Assumptions, and Plan Amendments

This valuation reflects the following changes in assumptions and methods:

- Ten plans had a change in the valuation discount rate, but the method for determining the discount rate stayed the same.
- Starting with this July 1, 2019 valuation, past benefit overpayments that were approved to continue by the City of Huntington for the Fire and Police plans are funded on a pay-as-you-go basis pursuant to West Virginia Code 8-22-27a(d).

There were no changes in the Plan provisions reflected in this valuation.

Special Funding Situations

There were four funds where the cities approved the continued overpayment of miscalculated benefits. These four funds are Huntington Fire, Huntington Police, Morgantown Fire and Morgantown Police. For these four funds, we calculate the contribution under the relevant funding policy as if the payments were corrected and add an additional contribution for the expected overpayments for the current plan year on a pay-as-you-go basis pursuant to West Virginia Code 8-22-27a(d).



Summary of Plan Statistics

Plan	Active	Retired	Inactive	Total	Funding Policy	Open/Closed	Discount Rate	Return on Assets	Asset Value	Unfunded Accrued Liability	Funded Ratio
Beckley Fire	42	58	1	101	Alternative	O	5.00%	7.27%	19,275,679	26,124,810	42%
Beckley Police	53	50	1	104	Alternative	O	6.00%	7.56%	23,656,733	13,073,201	64%
Belle Police	0	5	1	6	Optional	C	7.00%	6.10%	1,505,408	147,540	91%
Bluefield Fire	16	39	2	57	Alternative	O	5.00%	4.34%	4,405,173	14,277,896	24%
Bluefield Police	26	30	1	57	Alternative	O	6.00%	8.44%	6,669,806	7,196,132	48%
Charles Town Police	0	4	0	4	Standard	C	5.00%	3.04%	504,435	730,855	41%
Charleston Fire	103	240	4	347	Conservation	C	4.50%	6.00%	22,233,766	173,959,861	11%
Charleston Police	96	216	9	321	Conservation	C	4.50%	5.88%	24,603,586	162,414,225	13%
Chester Police	2	5	1	8	Optional	C	7.00%	4.24%	1,699,602	448,617	79%
Clarksburg Fire	42	52	0	94	Alternative	O	5.00%	5.78%	9,953,711	26,622,863	27%
Clarksburg Police	37	51	4	92	Alternative	O	5.50%	3.43%	9,371,819	19,549,516	32%
Dunbar Fire	15	23	0	38	Conservation	C	4.50%	7.36%	1,032,669	13,730,170	7%
Dunbar Police	6	14	0	20	Optional	C	6.00%	7.91%	6,394,042	2,318,840	73%
Elkins Fire	3	2	0	5	Optional	C	6.00%	6.33%	1,788,546	56,337	97%
Elkins Police	3	11	0	14	Optional	C	6.50%	7.14%	3,691,416	1,124,678	77%
Fairmont Fire	38	51	0	89	Conservation	C	4.50%	5.72%	3,689,729	39,282,934	9%
Fairmont Police	21	50	6	77	Conservation	C	5.00%	5.64%	7,041,464	22,680,568	24%
Grafton Fire	0	6	1	7	Optional	C	6.00%	7.82%	1,814,042	648,417	74%
Grafton Police	2	6	0	8	Optional	C	6.00%	5.51%	1,696,071	388,451	81%
Huntington Fire	60	172	4	236	Optional	C	5.00%	5.87%	29,952,605	87,506,534	26%
Huntington Police	54	141	1	196	Optional	C	5.50%	5.60%	40,327,592	66,087,053	38%
Logan Fire	8	2	0	10	Standard	O	6.00%	3.92%	973,787	1,003,978	49%
Logan Police	6	3	0	9	Standard	O	6.00%	3.47%	938,169	1,339,365	41%
Martinsburg Fire	35	34	0	69	Alternative	O	4.50%	3.35%	3,096,167	32,698,421	9%
Martinsburg Police	47	39	1	87	Alternative	O	4.50%	6.17%	9,148,893	32,123,225	22%
Morgantown Fire	61	56	0	117	Alternative	O	4.50%	5.61%	13,539,956	38,339,153	26%
Morgantown Police	68	68	0	136	Alternative	O	4.50%	5.66%	16,633,959	55,066,141	23%
Moundsville Fire	2	14	1	17	Optional	C	5.00%	5.20%	1,543,234	2,384,935	39%
Moundsville Police	7	17	0	24	Optional	C	6.50%	2.07%	5,660,198	2,723,989	68%
Nitro Fire	15	10	1	26	Alternative	O	4.50%	3.61%	2,095,659	8,640,482	20%
Nitro Police	18	14	1	33	Alternative	O	5.00%	5.84%	4,456,305	7,497,193	37%
Oak Hill Police	5	6	1	12	Optional	C	6.50%	7.26%	4,641,751	(670,732)	117%
Parkersburg Fire	50	94	0	144	Optional	C	5.50%	4.54%	19,054,698	41,038,715	32%
Parkersburg Police	60	81	4	145	Optional	C	5.50%	5.69%	16,757,159	38,554,464	30%
Point Pleasant Police	4	6	0	10	Optional	C	5.50%	1.85%	1,393,143	2,825,691	33%
Princeton Fire	12	17	3	32	Alternative	O	4.50%	5.66%	2,993,335	8,798,075	25%
Princeton Police	22	22	1	45	Alternative	O	5.00%	5.66%	4,466,263	9,093,863	33%
South Charleston Fire	43	45	2	90	Alternative	O	4.50%	4.32%	2,967,582	35,527,763	8%
South Charleston Police	49	36	1	86	Alternative	O	4.50%	6.95%	3,317,770	26,203,235	11%
St. Albans Fire	20	29	4	53	Alternative	O	4.00%	4.86%	2,909,056	19,099,094	13%
St. Albans Police	25	21	8	54	Alternative	O	5.50%	5.57%	7,350,349	9,252,891	44%
Star City Police	5	5	0	10	Optional	C	6.50%	6.66%	1,818,814	(9,818)	101%
Vienna Police	19	14	3	36	Standard	O	6.50%	7.09%	9,175,101	2,425,040	79%
Weirton Fire	21	20	0	41	Optional	C	6.50%	7.20%	11,756,068	3,852,339	75%
Weirton Police	36	50	1	87	Optional	C	5.00%	6.75%	7,159,100	28,414,587	20%
Welch Police	3	4	0	7	Optional	C	6.50%	8.49%	2,952,715	(535,670)	122%
Weston Fire	5	3	1	9	Optional	C	6.50%	10.43%	1,345,586	520,148	72%
Weston Police	3	4	0	7	Optional	C	6.50%	9.27%	1,572,660	(29,296)	102%
Westover Police	1	5	1	7	Optional	C	6.50%	5.56%	2,653,936	368,902	88%
Wheeling Fire	60	126	4	190	Optional	C	5.50%	5.78%	31,719,901	45,347,183	41%
Wheeling Police	40	105	6	151	Optional	C	6.00%	5.59%	26,363,521	26,662,819	50%
Williamson Fire	4	12	1	17	Optional	C	5.50%	5.20%	1,667,847	2,834,256	37%
Williamson Police	3	8	0	11	Optional	C	7.00%	4.71%	1,185,937	1,208,306	50%
Totals	1,376	2,196	81	3,653			5.00%¹	5.92%²	444,616,513	1,160,968,235	28%

¹ Weighted average by liabilities on the valuation date. The discount rate weighed by BOY asset values is 5.35%.

² Weighted average by asset size.

Section II. Discount Rate

The discount rate is used to discount future benefit payments in order to determine the liability for a pension plan. The lower the discount rate used, the higher the liability will be. In general, a discount rate for a public pension plan is determined from the expected return on investments of the asset portfolio supporting the plan. The discount rate is determined based on the weighted expected return of the various asset classes in the portfolio. Public pension plans that do not have assets or fund benefits from their general funds tend to use a discount rate that is similar to a municipal bond yield, which is usually much lower than the expected return on the asset portfolio. Because many of the pension plans under MPOB's oversight have funding percentages well below 50%, using the expected asset return to discount the liabilities may not be reasonable. Therefore, the MPOB has adopted a method for determining the discount rate that takes into consideration the funded status of the plans as well as the underlying asset allocation of the funds.

Discount Rate Distribution

The discount rate is determined based on a plan's current funded status, liquidity ratio, target equity exposure, and projected funded status in 15 years. A more detailed description of the discount rate method can be found in *Section X. Actuarial Methods and Assumptions*. The following table provides the discount rate used for the July 1, 2019 valuation for each of the 53 pension plans.

Municipality	Plan	Discount Rate
Beckley	Fire	5.00%
Beckley	Police	6.00%
Belle	Police	7.00%
Bluefield	Fire	5.00%
Bluefield	Police	6.00%
Charles Town	Police	5.00%
Charleston	Fire	4.50%
Charleston	Police	4.50%
Chester	Police	7.00%
Clarksburg	Fire	5.00%
Clarksburg	Police	5.50%
Dunbar	Fire	4.50%
Dunbar	Police	6.00%
Elkins	Fire	6.00%
Elkins	Police	6.50%
Fairmont	Fire	4.50%
Fairmont	Police	5.00%
Grafton	Fire	6.00%
Grafton	Police	6.00%
Huntington	Fire	5.00%
Huntington	Police	5.50%
Logan	Fire	6.00%
Logan	Police	6.00%
Martinsburg	Fire	4.50%
Martinsburg	Police	4.50%
Morgantown	Fire	4.50%
Morgantown	Police	4.50%

Municipality	Plan	Discount Rate
Moundsville	Fire	5.00%
Moundsville	Police	6.50%
Nitro	Fire	4.50%
Nitro	Police	5.00%
Oak Hill	Police	6.50%
Parkersburg	Fire	5.50%
Parkersburg	Police	5.50%
Point Pleasant	Police	5.50%
Princeton	Fire	4.50%
Princeton	Police	5.00%
South Charleston	Fire	4.50%
South Charleston	Police	4.50%
St. Albans	Fire	4.00%
St. Albans	Police	5.50%
Star City	Police	6.50%
Vienna	Police	6.50%
Weirton	Fire	6.50%
Weirton	Police	5.00%
Welch	Police	6.50%
Weston	Fire	6.50%
Weston	Police	6.50%
Westover	Police	6.50%
Wheeling	Fire	5.50%
Wheeling	Police	6.00%
Williamson	Fire	5.50%
Williamson	Police	7.00%
Average³		5.00%

³ Weighted average by liabilities on the valuation date.
MPOB Consolidated Actuarial Report



Changes in Discount Rate

The following table lists the plans that had a change in their discount rate from 2018 to 2019.

Plan Name	2018 Discount Rate	2019 Discount Rate
Beckley Fire	4.50%	5.00%
Beckley Police	5.50%	6.00%
Chester Police	6.50%	7.00%
Clarksburg Police	5.00%	5.50%
Fairmont Fire	4.00%	4.50%
Parkersburg Fire	5.00%	5.50%
Parkersburg Police	5.00%	5.50%
Point Pleasant Police	5.00%	5.50%
Weirton Police	4.50%	5.00%
Williamson Police	6.00%	7.00%



Section III. Actuarial Valuation Results

Key Valuation Results by Funding Policy

Below is a summary of the key valuation results by funding policy as of July 1, 2019.

	Standard	Opt. from Stan.	Opt. from Alt.	Alternative	Conservation	All Plans
Participating Funds	4	11	15	18	5	53
Plan Membership						
(a) Actives	33	26	413	631	273	1,376
(b) Retirees	12	43	570	405	369	1,399
(c) Survivors	6	13	215	164	127	525
(d) Disableds	5	4	77	102	84	272
(e) Deferred Vesteds	1	1	9	8	12	31
(f) Former Members Due Refunds	<u>2</u>	<u>4</u>	<u>14</u>	<u>23</u>	<u>7</u>	<u>50</u>
(g) Total	59	91	1,298	1,333	872	3,653
Payroll (Expected for FYE 2020)	1,594,846	1,365,390	23,796,542	35,097,116	16,433,885	78,287,779
Expected Benefit Payments	676,586	1,659,136	28,386,768	21,767,808	19,341,283	71,831,581
Actuarial Accrued Liabilities						
(a) Actives	7,455,971	7,521,340	160,515,682	199,939,165	141,951,762	517,383,920
(b) Retirees	5,787,000	18,717,545	317,192,766	256,627,674	242,782,120	841,107,105
(c) Survivors	1,409,579	1,968,487	37,637,625	30,754,958	26,649,128	98,419,777
(d) Disableds	2,029,348	1,473,148	31,692,752	43,531,519	48,472,950	127,199,717
(e) Deferred Vesteds	408,370	410,458	4,754,688	4,343,213	10,636,108	20,552,837
(f) Former Members Due Refunds	<u>462</u>	<u>91,247</u>	<u>357,139</u>	<u>295,640</u>	<u>176,904</u>	<u>921,392</u>
(g) Total Liabilities	17,090,730	30,182,225	552,150,652	535,492,169	470,668,972	1,605,584,748
Funded Levels						
Market Value of Assets	11,591,492	25,409,290	202,706,302	146,308,215	58,601,214	444,616,513
Unfunded Liability	5,499,238	4,772,935	349,444,350	389,183,954	412,067,758	1,160,968,235
Funded Ratio	68%	84%	37%	27%	12%	28%
Normal Cost (BOY)						
Net Employer Normal Cost	395,514	351,738	7,330,006	13,012,043	6,971,871	28,061,172
(% of Payroll)	26%	27%	32%	38%	43%	37%
FYE 2021 Contributions						
Total Employer Contributions	713,335	654,285	23,680,254	11,428,413	16,239,347	52,715,634
(% of Payroll)	45%	48%	100%	33%	99%	67%
State Premium Tax Allocation	334,401	565,433	7,093,372	7,069,885	4,958,733	20,021,824
(% of Payroll)	21%	41%	30%	20%	30%	26%
Employee Contributions	126,359	106,620	1,759,396	2,988,523	1,335,155	6,316,053
(% of Payroll)	8%	8%	7%	9%	8%	8%
Total Contributions	1,174,095	1,326,338	32,533,022	21,486,821	22,533,235	79,053,511
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-



Below is a summary of the key valuation results by funding policy as of July 1, 2018.

	Standard	Opt. from Stan.	Opt. from Alt.	Alternative	Conservation	All Plans
Participating Funds	4	11	15	18	5	53
Plan Membership						
(a) Actives	32	32	442	633	291	1,430
(b) Retirees	12	43	573	395	366	1,389
(c) Survivors	5	13	212	159	129	518
(d) Disableds	5	4	79	103	85	276
(e) Deferred Vesteds	0	1	11	11	9	32
(f) Former Members Due Refunds	<u>3</u>	<u>2</u>	<u>8</u>	<u>20</u>	<u>7</u>	<u>40</u>
(g) Total	57	95	1,325	1,321	887	3,685
Payroll (Expected for FYE 2019)	1,497,429	1,541,740	24,481,133	34,183,694	17,401,245	79,105,241
Expected Benefit Payments	682,481	1,554,808	27,006,422	20,586,468	18,658,900	68,489,079
Actuarial Accrued Liabilities						
(a) Actives	6,945,743	7,681,963	158,228,097	192,291,509	140,236,639	505,383,951
(b) Retirees	5,454,684	18,576,289	313,451,416	248,431,828	236,893,159	822,807,376
(c) Survivors	1,181,049	1,892,825	36,178,375	29,138,685	26,587,351	94,978,285
(d) Disableds	2,017,292	1,512,841	32,461,830	42,621,186	48,771,324	127,384,473
(e) Deferred Vesteds	0	384,180	6,351,767	6,880,516	7,985,136	21,601,599
(f) Former Members Due Refunds	<u>41,625</u>	<u>35,533</u>	<u>195,591</u>	<u>126,978</u>	<u>219,215</u>	<u>618,942</u>
(g) Total Liabilities	15,640,393	30,083,631	546,867,076	519,490,702	460,692,824	1,572,774,626
Funded Levels						
Market Value of Assets	10,658,276	23,919,956	183,005,870	136,585,664	53,077,569	407,247,335
Unfunded Liability	4,982,117	6,163,675	363,861,206	382,905,038	407,615,255	1,165,527,291
Funded Ratio	68%	80%	33%	26%	12%	26%
Normal Cost (BOY)						
Net Employer Normal Cost	380,231	402,678	8,098,821	13,146,562	7,398,651	29,426,943
(% of Payroll)	26%	27%	35%	39%	43%	38%
FYE 2020 Contributions						
Total Employer Contributions	610,455	844,695	24,873,046	10,917,367	15,221,359	52,466,922
(% of Payroll)	41%	55%	102%	32%	87%	66%
State Premium Tax Allocation	329,687	481,942	6,929,285	6,889,167	4,936,972	19,567,053
(% of Payroll)	22%	31%	28%	20%	28%	25%
Employee Contributions	116,048	121,071	1,809,406	2,884,557	1,413,694	6,344,776
(% of Payroll)	8%	8%	7%	8%	8%	8%
Total Contributions	1,056,190	1,447,708	33,611,737	20,691,091	21,572,025	78,378,751
Additional 2020 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-

Key Valuation Results by Municipality

Below is a summary of the key valuation results for each individual municipality as of July 1, 2019.

	Beckley Fire	Beckley Police	Belle Police	Bluefield Fire	Bluefield Police	Charles Town Police
Discount Rate	5.00%	6.00%	7.00%	5.00%	6.00%	5.00%
Plan Membership						
(a) Actives	42	53	0	16	26	0
(b) Retirees	36	27	4	24	18	1
(c) Survivors	15	13	1	8	9	3
(d) Disableds	7	10	0	7	3	0
(e) Deferred Vesteds	1	1	0	1	0	0
(f) Former Members Due Refunds	0	0	1	1	1	0
(g) Total	101	104	6	57	57	4
Payroll (Expected for FYE 2020)	2,299,930	2,931,036	0	770,135	1,121,382	0
Expected Benefit Payments	2,158,952	1,624,826	180,084	902,917	764,955	84,668
Actuarial Accrued Liabilities						
(a) Actives	15,836,822	13,301,958	0	2,470,656	2,485,062	0
(b) Retirees	23,377,912	16,526,555	1,423,657	11,411,285	9,277,940	435,398
(c) Survivors	2,512,540	2,600,843	194,743	1,293,779	1,170,775	799,892
(d) Disableds	3,034,103	3,806,574	0	2,824,100	928,654	0
(e) Deferred Vesteds	639,112	494,004	0	672,750	0	0
(f) Former Members Due Refunds	0	0	34,548	10,499	3,507	0
(g) Total Liabilities	45,400,489	36,729,934	1,652,948	18,683,069	13,865,938	1,235,290
Funded Levels						
Market Value of Assets	19,275,679	23,656,733	1,505,408	4,405,173	6,669,806	504,435
Unfunded Liability	26,124,810	13,073,201	147,540	14,277,896	7,196,132	730,855
Funded Ratio	42%	64%	91%	24%	48%	41%
Normal Cost (BOY)						
Net Employer Normal Cost	856,717	769,351	185	258,465	290,225	1,137
(% of Payroll)	38%	27%	N/A	34%	27%	N/A
FYE 2021 Contributions						
Total Employer Contributions	825,096	629,712	191	509,724	413,518	69,661
(% of Payroll)	36%	21%	N/A	66%	37%	N/A
State Premium Tax Allocation	518,795	565,302	39,223	234,494	300,406	11,975
(% of Payroll)	23%	19%	N/A	30%	27%	N/A
Employee Contributions	184,574	236,852	0	67,508	100,903	0
(% of Payroll)	8%	8%	N/A	9%	9%	N/A
Total Contributions	1,528,465	1,431,866	39,414	811,726	814,827	81,636
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	7.27%	7.56%	6.10%	4.34%	8.44%	3.04%
Funding Policy	Alternative	Alternative	Optional	Alternative	Alternative	Standard

	Charleston Fire	Charleston Police	Chester Police	Clarksburg Fire	Clarksburg Police	Dunbar Fire
Discount Rate	4.50%	4.50%	7.00%	5.00%	5.50%	4.50%
Plan Membership						
(a) Actives	103	96	2	42	37	15
(b) Retirees	151	133	3	31	27	17
(c) Survivors	49	47	2	16	14	3
(d) Disableds	40	36	0	5	10	3
(e) Deferred Vesteds	3	8	0	0	1	0
(f) Former Members Due Refunds	<u>1</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>3</u>	<u>0</u>
(g) Total	347	321	8	94	92	38
Payroll (Expected for FYE 2020)	6,147,535	6,434,785	97,042	2,064,594	1,852,849	749,877
Expected Benefit Payments	8,105,706	7,418,935	159,583	1,444,001	1,480,878	639,600
Actuarial Accrued Liabilities						
(a) Actives	57,923,669	55,500,606	94,101	17,347,051	6,743,365	3,606,818
(b) Retirees	102,098,394	90,388,576	1,604,659	14,928,631	16,483,285	9,413,544
(c) Survivors	10,592,006	11,313,642	430,427	2,421,982	2,347,374	300,645
(d) Disableds	23,127,784	22,382,948	0	1,878,910	2,775,686	1,441,832
(e) Deferred Vesteds	2,379,922	7,411,398	0	0	568,659	0
(f) Former Members Due Refunds	<u>71,852</u>	<u>20,641</u>	<u>19,032</u>	<u>0</u>	<u>2,966</u>	<u>0</u>
(g) Total Liabilities	196,193,627	187,017,811	2,148,219	36,576,574	28,921,335	14,762,839
Funded Levels						
Market Value of Assets	22,233,766	24,603,586	1,699,602	9,953,711	9,371,819	1,032,669
Unfunded Liability	173,959,861	162,414,225	448,617	26,622,863	19,549,516	13,730,170
Funded Ratio	11%	13%	79%	27%	32%	7%
Normal Cost (BOY)						
Net Employer Normal Cost	2,681,799	2,754,885	16,133	756,703	546,733	294,372
(% of Payroll)	45%	44%	17%	38%	30%	40%
FYE 2021 Contributions						
Total Employer Contributions	7,137,850	6,395,302	32,068	1,244,276	1,232,529	493,385
(% of Payroll)	116%	99%	33%	60%	67%	66%
State Premium Tax Allocation	1,963,296	1,907,763	39,223	494,586	460,990	173,632
(% of Payroll)	32%	30%	40%	24%	25%	23%
Employee Contributions	492,024	514,924	9,225	158,362	156,594	65,449
(% of Payroll)	8%	8%	10%	8%	8%	9%
Total Contributions	9,593,170	8,817,989	80,516	1,897,224	1,850,113	732,466
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	6.00%	5.88%	4.24%	5.78%	3.43%	7.36%
Funding Policy	Conservation	Conservation	Optional	Alternative	Alternative	Conservation

	Dunbar Police	Elkins Fire	Elkins Police	Fairmont Fire	Fairmont Police	Grafton Fire
Discount Rate	6.00%	6.00%	6.50%	4.50%	5.00%	6.00%
Plan Membership						
(a) Actives	6	3	3	38	21	0
(b) Retirees	9	1	9	37	31	5
(c) Survivors	1	1	2	13	15	0
(d) Disableds	4	0	0	1	4	1
(e) Deferred Vesteds	0	0	0	0	1	0
(f) Former Members Due Refunds	0	0	0	0	5	1
(g) Total	20	5	14	89	77	7
Payroll (Expected for FYE 2020)	356,236	192,149	134,849	1,948,787	1,152,901	0
Expected Benefit Payments	428,972	46,900	354,810	1,657,418	1,519,624	183,182
Actuarial Accrued Liabilities						
(a) Actives	1,923,095	1,459,466	240,544	19,341,137	5,579,532	0
(b) Retirees	4,819,933	380,142	4,150,601	21,816,177	19,065,429	2,137,027
(c) Survivors	123,528	5,275	424,949	1,590,320	2,852,515	0
(d) Disableds	1,846,326	0	0	225,029	1,295,357	288,750
(e) Deferred Vesteds	0	0	0	0	844,788	0
(f) Former Members Due Refunds	0	0	0	0	84,411	36,682
(g) Total Liabilities	8,712,882	1,844,883	4,816,094	42,972,663	29,722,032	2,462,459
Funded Levels						
Market Value of Assets	6,394,042	1,788,546	3,691,416	3,689,729	7,041,464	1,814,042
Unfunded Liability	2,318,840	56,337	1,124,678	39,282,934	22,680,568	648,417
Funded Ratio	73%	97%	77%	9%	24%	74%
Normal Cost (BOY)						
Net Employer Normal Cost	107,960	57,838	25,909	855,950	384,865	213
(% of Payroll)	31%	31%	20%	45%	34%	N/A
FYE 2021 Contributions						
Total Employer Contributions	131,220	59,548	35,783	1,264,194	948,616	27,706
(% of Payroll)	37%	31%	27%	65%	82%	N/A
State Premium Tax Allocation	142,570	61,484	124,531	480,010	434,032	47,633
(% of Payroll)	40%	32%	92%	25%	38%	N/A
Employee Contributions	26,367	13,464	11,600	167,653	95,105	0
(% of Payroll)	7%	7%	9%	9%	8%	N/A
Total Contributions	300,157	134,496	171,914	1,911,857	1,477,753	75,339
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	7.91%	6.33%	7.14%	5.72%	5.64%	7.82%
Funding Policy	Optional	Optional	Optional	Conservation	Conservation	Optional

	Grafton Police	Huntington Fire	Huntington Police	Logan Fire	Logan Police	Martinsburg Fire
Discount Rate	6.00%	5.00%	5.50%	6.00%	6.00%	4.50%
Plan Membership						
(a) Actives	2	60	54	8	6	35
(b) Retirees	0	112	98	1	3	21
(c) Survivors	4	42	29	1	0	7
(d) Disableds	2	18	14	0	0	6
(e) Deferred Vesteds	0	4	1	0	0	0
(f) Former Members Due Refunds	0	0	0	0	0	0
(g) Total	8	236	196	10	9	69
Payroll (Expected for FYE 2020)	116,045	3,402,515	3,783,881	331,371	232,400	2,098,326
Expected Benefit Payments	77,887	5,803,292	5,147,123	29,604	82,610	1,343,787
Actuarial Accrued Liabilities						
(a) Actives	941,964	28,008,157	31,998,930	1,679,128	905,597	14,485,486
(b) Retirees	0	70,770,972	62,060,550	156,349	1,371,937	17,307,983
(c) Survivors	520,178	8,344,322	6,414,489	142,288	0	1,809,180
(d) Disableds	622,380	8,052,518	5,380,510	0	0	2,191,939
(e) Deferred Vesteds	0	2,283,170	560,166	0	0	0
(f) Former Members Due Refunds	0	0	0	0	0	0
(g) Total Liabilities	2,084,522	117,459,139	106,414,645	1,977,765	2,277,534	35,794,588
Funded Levels						
Market Value of Assets	1,696,071	29,952,605	40,327,592	973,787	938,169	3,096,167
Unfunded Liability	388,451	87,506,534	66,087,053	1,003,978	1,339,365	32,698,421
Funded Ratio	81%	26%	38%	49%	41%	9%
Normal Cost (BOY)						
Net Employer Normal Cost	33,118	1,260,107	1,166,602	95,013	67,454	857,634
(% of Payroll)	29%	38%	32%	30%	30%	42%
FYE 2021 Contributions						
Total Employer Contributions	34,097	5,641,057	4,469,852	145,387	172,626	870,331
(% of Payroll)	29%	166%	118%	44%	74%	41%
State Premium Tax Allocation	78,598	1,175,584	1,129,547	68,748	51,991	384,590
(% of Payroll)	68%	35%	30%	21%	22%	18%
Employee Contributions	8,125	238,243	265,077	25,275	19,128	174,476
(% of Payroll)	7%	7%	7%	8%	8%	8%
Total Contributions	120,820	7,054,884	5,864,476	239,410	243,745	1,429,397
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	5.51%	5.87%	5.60%	3.92%	3.47%	3.35%
Funding Policy	Optional	Optional	Optional	Standard	Standard	Alternative

	Martinsburg Police	Morgantown Fire	Morgantown Police	Moundsville Fire	Moundsville Police	Nitro Fire
Discount Rate	4.50%	4.50%	4.50%	5.00%	6.50%	4.50%
Plan Membership						
(a) Actives	47	61	68	2	7	15
(b) Retirees	22	38	47	6	10	7
(c) Survivors	9	16	13	7	7	1
(d) Disableds	8	2	8	1	0	2
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	1	0	0	1	0	1
(g) Total	87	117	136	17	24	26
Payroll (Expected for FYE 2020)	2,915,347	3,736,884	4,683,481	107,433	405,000	848,537
Expected Benefit Payments	1,452,505	1,820,206	2,648,610	297,779	410,064	337,560
Actuarial Accrued Liabilities						
(a) Actives	18,374,063	24,438,301	28,798,907	581,973	2,668,480	4,734,194
(b) Retirees	17,882,075	23,949,459	36,449,394	1,743,830	4,824,619	4,291,761
(c) Survivors	1,806,099	2,612,141	2,698,973	1,278,629	891,088	161,805
(d) Disableds	3,157,742	879,208	3,752,826	312,916	0	1,547,843
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	52,139	0	0	10,821	0	538
(g) Total Liabilities	41,272,118	51,879,109	71,700,100	3,928,169	8,384,187	10,736,141
Funded Levels						
Market Value of Assets	9,148,893	13,539,956	16,633,959	1,543,234	5,660,198	2,095,659
Unfunded Liability	32,123,225	38,339,153	55,066,141	2,384,935	2,723,989	8,640,482
Funded Ratio	22%	26%	23%	39%	68%	20%
Normal Cost (BOY)						
Net Employer Normal Cost	1,202,187	1,578,038	1,781,197	44,774	98,539	336,922
(% of Payroll)	42%	43%	39%	43%	25%	41%
FYE 2021 Contributions						
Total Employer Contributions	717,529	920,414	1,158,545	115,472	132,686	202,974
(% of Payroll)	25%	25%	25%	107%	33%	24%
State Premium Tax Allocation	485,176	638,747	763,467	80,722	170,026	148,540
(% of Payroll)	17%	17%	16%	75%	42%	18%
Employee Contributions	248,845	305,059	445,121	7,521	28,370	70,643
(% of Payroll)	9%	8%	10%	7%	7%	8%
Total Contributions	1,451,550	1,864,220	2,367,133	203,715	331,082	422,157
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	6.17%	5.61%	5.66%	5.20%	2.07%	3.61%
Funding Policy	Alternative	Alternative	Alternative	Optional	Optional	Alternative

	Nitro Police	Oak Hill Police	Parkersburg Fire	Parkersburg Police	Point Pleasant Police	Princeton Fire
Discount Rate	5.00%	6.50%	5.50%	5.50%	5.50%	4.50%
Plan Membership						
(a) Actives	18	5	50	60	4	12
(b) Retirees	7	5	64	48	4	11
(c) Survivors	4	1	19	23	1	3
(d) Disableds	3	0	11	10	1	3
(e) Deferred Vesteds	0	0	0	0	0	3
(f) Former Members Due Refunds	1	1	0	4	0	0
(g) Total	33	12	144	145	10	32
Payroll (Expected for FYE 2020)	1,059,432	296,703	2,513,967	3,307,254	165,235	629,587
Expected Benefit Payments	426,742	175,360	2,882,080	2,481,509	149,505	430,075
Actuarial Accrued Liabilities						
(a) Actives	5,169,765	1,456,207	18,889,610	18,973,483	1,799,667	3,370,220
(b) Retirees	4,275,921	2,338,543	34,034,894	27,239,204	1,706,795	4,887,391
(c) Survivors	961,013	175,284	2,732,773	3,935,382	150,354	486,791
(d) Disableds	1,482,132	0	4,436,136	5,125,096	562,018	1,804,800
(e) Deferred Vesteds	0	0	0	0	0	1,242,208
(f) Former Members Due Refunds	64,667	985	0	38,458	0	0
(g) Total Liabilities	11,953,498	3,971,019	60,093,413	55,311,623	4,218,834	11,791,410
Funded Levels						
Market Value of Assets	4,456,305	4,641,751	19,054,698	16,757,159	1,393,143	2,993,335
Unfunded Liability	7,497,193	-670,732	41,038,715	38,554,464	2,825,691	8,798,075
Funded Ratio	37%	117%	32%	30%	33%	25%
Normal Cost (BOY)						
Net Employer Normal Cost	372,700	66,013	827,750	1,001,556	63,540	248,423
(% of Payroll)	36%	23%	34%	31%	39%	40%
FYE 2021 Contributions						
Total Employer Contributions	217,846	68,124	2,850,519	2,801,725	305,139	131,921
(% of Payroll)	21%	23%	113%	85%	185%	21%
State Premium Tax Allocation	186,465	0	730,679	792,677	79,327	149,916
(% of Payroll)	18%	0%	29%	24%	48%	24%
Employee Contributions	92,861	23,685	190,028	261,401	11,584	51,330
(% of Payroll)	9%	8%	8%	8%	7%	8%
Total Contributions	497,172	91,809	3,771,226	3,855,803	396,050	333,167
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	5.84%	7.26%	4.54%	5.69%	1.85%	5.66%
Funding Policy	Alternative	Optional	Optional	Optional	Optional	Alternative

	Princeton Police	South Charleston Fire	South Charleston Police	St. Albans Fire	St. Albans Police	Star City Police
Discount Rate	5.00%	4.50%	4.50%	4.00%	5.50%	6.50%
Plan Membership						
(a) Actives	22	43	49	20	25	5
(b) Retirees	17	25	16	15	16	1
(c) Survivors	2	13	8	9	4	4
(d) Disableds	3	7	12	5	1	0
(e) Deferred Vesteds	0	1	0	0	0	0
(f) Former Members Due Refunds	<u>1</u>	<u>1</u>	<u>1</u>	<u>4</u>	<u>8</u>	<u>0</u>
(g) Total	45	90	86	53	54	10
Payroll (Expected for FYE 2020)	1,233,179	2,335,057	2,348,074	968,872	1,200,414	269,331
Expected Benefit Payments	650,547	1,353,666	1,058,350	1,043,765	825,466	84,004
Actuarial Accrued Liabilities						
(a) Actives	3,500,141	14,892,664	12,391,993	6,550,092	5,048,425	571,959
(b) Retirees	8,395,353	16,173,617	9,702,860	11,281,309	10,024,943	395,968
(c) Survivors	328,964	3,141,319	1,852,308	1,696,129	852,943	841,069
(d) Disableds	1,294,408	3,540,624	5,563,850	2,473,759	594,361	0
(e) Deferred Vesteds	0	726,480	0	0	0	0
(f) Former Members Due Refunds	<u>41,260</u>	<u>20,641</u>	<u>9,994</u>	<u>6,861</u>	<u>82,568</u>	<u>0</u>
(g) Total Liabilities	13,560,126	38,495,345	29,521,005	22,008,150	16,603,240	1,808,996
Funded Levels						
Market Value of Assets	4,466,263	2,967,582	3,317,770	2,909,056	7,350,349	1,818,814
Unfunded Liability	9,093,863	35,527,763	26,203,235	19,099,094	9,252,891	-9,818
Funded Ratio	33%	8%	11%	13%	44%	101%
Normal Cost (BOY)						
Net Employer Normal Cost	390,136	983,631	953,554	468,640	360,787	59,499
(% of Payroll)	32%	43%	42%	49%	31%	23%
FYE 2021 Contributions						
Total Employer Contributions	260,419	903,957	502,878	315,316	371,428	61,402
(% of Payroll)	21%	39%	21%	33%	31%	23%
State Premium Tax Allocation	235,555	468,691	506,695	268,863	258,607	0
(% of Payroll)	19%	20%	22%	28%	22%	0%
Employee Contributions	109,627	186,764	192,812	92,069	114,123	24,185
(% of Payroll)	9%	8%	8%	10%	10%	9%
Total Contributions	605,601	1,559,412	1,202,385	676,248	744,158	85,587
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	5.66%	4.32%	6.95%	4.86%	5.57%	6.66%
Funding Policy	Alternative	Alternative	Alternative	Alternative	Alternative	Optional

	Vienna Police	Weirton Fire	Weirton Police	Welch Police	Weston Fire	Weston Police
Discount Rate	6.50%	6.50%	5.00%	6.50%	6.50%	6.50%
Plan Membership						
(a) Actives	19	21	36	3	5	3
(b) Retirees	7	17	37	4	3	3
(c) Survivors	2	3	10	0	0	1
(d) Disableds	5	0	3	0	0	0
(e) Deferred Vesteds	1	0	0	0	0	0
(f) Former Members Due Refunds	<u>2</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>
(g) Total	36	41	87	7	9	7
Payroll (Expected for FYE 2020)	1,031,075	1,178,596	2,062,366	158,748	176,788	150,998
Expected Benefit Payments	479,704	769,615	1,664,750	106,691	80,768	74,887
Actuarial Accrued Liabilities						
(a) Actives	4,871,246	6,566,687	12,074,325	744,405	743,527	506,679
(b) Retirees	3,823,316	8,496,875	20,719,284	1,672,640	1,115,916	969,408
(c) Survivors	467,399	544,845	1,604,459	0	0	67,277
(d) Disableds	2,029,348	0	1,129,134	0	0	0
(e) Deferred Vesteds	408,370	0	0	0	0	0
(f) Former Members Due Refunds	<u>462</u>	<u>0</u>	<u>46,485</u>	<u>0</u>	<u>6,291</u>	<u>0</u>
(g) Total Liabilities	11,600,141	15,608,407	35,573,687	2,417,045	1,865,734	1,543,364
Funded Levels						
Market Value of Assets	9,175,101	11,756,068	7,159,100	2,952,715	1,345,586	1,572,660
Unfunded Liability	2,425,040	3,852,339	28,414,587	-535,670	520,148	-29,296
Funded Ratio	79%	75%	20%	122%	72%	102%
Normal Cost (BOY)						
Net Employer Normal Cost	231,910	305,696	690,560	38,694	46,209	30,068
(% of Payroll)	23%	27%	34%	25%	27%	21%
FYE 2021 Contributions						
Total Employer Contributions	325,661	334,370	2,051,832	39,931	47,688	31,030
(% of Payroll)	32%	28%	99%	25%	27%	21%
State Premium Tax Allocation	201,687	265,394	446,653	0	49,405	0
(% of Payroll)	20%	23%	22%	0%	28%	0%
Employee Contributions	81,956	93,204	189,644	12,043	15,065	13,141
(% of Payroll)	8%	8%	9%	8%	9%	9%
Total Contributions	609,304	692,968	2,688,129	51,974	112,158	44,171
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	7.09%	7.20%	6.75%	8.49%	10.43%	9.27%
Funding Policy	Standard	Optional	Optional	Optional	Optional	Optional

	Westover Police	Wheeling Fire	Wheeling Police	Williamson Fire	Williamson Police	Total
Discount Rate	6.50%	5.50%	6.00%	5.50%	7.00%	N/A
Plan Membership						
(a) Actives	1	60	40	4	3	1,376
(b) Retirees	5	86	70	6	3	1,399
(c) Survivors	0	34	28	4	4	525
(d) Disableds	0	6	7	2	1	272
(e) Deferred Vesteds	1	3	1	0	0	31
(f) Former Members Due Refunds	0	1	5	1	0	50
(g) Total	7	190	151	17	11	3,653
Payroll (Expected for FYE 2020)	53,621	3,851,373	2,124,132	135,042	122,628	78,287,779
Expected Benefit Payments	150,247	4,765,048	3,192,524	245,887	133,353	71,831,581
Actuarial Accrued Liabilities						
(a) Actives	278,307	23,782,647	12,605,277	590,623	536,909	517,383,920
(b) Retirees	2,334,073	44,204,529	33,337,288	2,332,233	1,096,671	841,107,105
(c) Survivors	0	5,785,918	3,813,062	781,952	546,109	98,419,777
(d) Disableds	0	1,825,076	2,591,151	779,335	214,554	127,199,717
(e) Deferred Vesteds	410,458	1,447,797	463,555	0	0	20,552,837
(f) Former Members Due Refunds	0	21,117	216,007	17,960	0	921,392
(g) Total Liabilities	3,022,838	77,067,084	53,026,340	4,502,103	2,394,243	1,605,584,748
Funded Levels						
Market Value of Assets	2,653,936	31,719,901	26,363,521	1,667,847	1,185,937	444,616,513
Unfunded Liability	368,902	45,347,183	26,662,819	2,834,256	1,208,306	1,160,968,235
Funded Ratio	88%	41%	50%	37%	50%	28%
Normal Cost (BOY)						
Net Employer Normal Cost	20,027	1,092,961	561,883	42,429	23,481	28,061,172
(% of Payroll)	39%	35%	27%	32%	20%	37%
FYE 2021 Contributions						
Total Employer Contributions	20,668	3,235,422	1,602,278	154,146	50,585	52,715,634
(% of Payroll)	39%	84%	75%	114%	41%	67%
State Premium Tax Allocation	95,414	1,118,403	846,301	78,044	67,367	20,021,824
(% of Payroll)	178%	29%	40%	58%	55%	26%
Employee Contributions	3,753	235,917	163,760	10,961	9,653	6,316,053
(% of Payroll)	7%	6%	8%	8%	8%	8%
Total Contributions	119,835	4,589,742	2,612,339	243,151	127,605	79,053,511
Additional 2021 Solvency Contribution						
- To Receive State Allocation	-	-	-	-	-	-
- To provide COLA Benefits	-	-	-	-	-	-
Asset Return	5.56%	5.78%	5.59%	5.20%	4.71%	
Funding Policy	Optional	Optional	Optional	Optional	Optional	

Experience (Gain)/Loss for Plan Year Ended June 30, 2019

The following is a determination of the gains and losses on the collective liabilities and assets for all the plans.

Experience (Gain)/Loss for Plan Year Ended June 30, 2019		
1. Liabilities		
a. Actuarial Accrued Liability as of 7/1/2018	\$	1,572,774,626
b. Normal Cost as of 7/1/2018		35,356,369
c. Interest on a. and b. to 6/30/2019		78,840,855
d. Benefit Payments with Interest to 6/30/2019		67,553,617
e. Effect of Assumption Changes		(22,601,053)
f. Expected Liability at 7/1/2019 (a. + b. + c. - d. + e.)		1,596,817,180
g. Actual Liability at 7/1/2019		1,605,584,748
h. Liability (Gain)/Loss (g. - f.)		8,767,568
2. Market Value of Assets		
a. Market Value of Assets as of 7/1/2018	\$	407,122,389
b. Interest on a. to 6/30/2019		21,334,866
c. Contributions with Interest to 6/30/2019		81,121,577
d. Benefit Payments with Interest to 6/30/2019		67,553,617
e. Administrative Expenses with Interest to 6/30/2019		228,368
f. Expected Assets at 6/30/2019 (a. + b. + c. - d. - e.)		441,796,847
g. Actual Assets at 6/30/2019		444,616,513
h. Asset (Gain)/Loss (f. - g.)		(2,819,666)
3. Total (Gain)/Loss (1h. + 2h.)	\$	5,947,902

The gains and losses shown are only for liability and asset gains and losses. Any change in the Unfunded Actuarial Accrued Liability from funding more or less than needed to cover Normal Cost and interest on the Unfunded Actuarial Accrued Liability is a separate amount.

Reconciliation of Assets

Below is a reconciliation of assets (unaudited) from July 1, 2017 through June 30, 2019.

Plan Year Ending	June 30, 2018	June 30, 2019
1. Beginning of Year Market Value of Assets	\$ 369,708,493	\$ 407,247,335
Adjustments to Market Value of Assets at Beginning of Year	(185,825)	(124,946)
Beginning of Year Market Value of Assets	\$ 369,522,668	\$ 407,122,389
2. Additions		
a. Contributions		
(i) Local Government	\$ 51,961,063	\$ 54,554,463
(ii) State Government	17,281,292	17,993,584
(iii) Employee	6,393,178	6,424,920
(iv) Total	75,635,533	78,972,967
b. Receivable Contribution ⁴		
(i) Local Government	\$ 2,819,573	\$ 136,054
(ii) State Government	670,238	7,041
(iii) Employee Contributions	22,429	49,998
(iv) Total	3,512,240	193,093
c. Earnings on Investments		
(i) Net Appreciation/(Depreciation)	\$ 10,049,013	\$ 12,055,857
(ii) Net Realized Gain (Loss) on Sale/Exchange	5,563,729	2,750,900
(iii) Interest and Dividends	8,140,839	11,117,848
(iv) Other Income	129,450	123,271
(v) Investment Expense	(1,578,148)	(1,744,473)
(vi) Receivable Investment Income	428,987	177,729
(vii) Payable Investment Expenses	0	0
(viii) Net Investment Income	22,733,870	24,481,132
d. Other Revenue	56,178	4,541
e. Total Additions	\$ 101,937,821	\$ 103,651,733
3. Disbursements		
a. Benefit Payments	\$ 62,196,524	\$ 64,360,734
b. Withdrawals	802,354	821,225
c. Administrative Expenses		
(i) Municipal Fees	206,912	157,377
(ii) Other Expenses	(122)	57,487
(iii) Total Administrative Expenses	206,790	214,864
d. Payable Benefits and Withdrawals	985,659	753,319
e. Payable Administrative Expenses	21,827	7,467
f. Total Disbursements	\$ 64,213,154	\$ 66,157,609
4. Net Increase (2.e. – 3.f.)	37,724,667	37,494,124
5. Net Assets (1. + 4.)	\$ 407,247,335	\$ 444,616,513
6. Rate of Return Net of Investment Fees (2I / [A + B – I] Method ⁵)	6.0%	5.9%

⁴ Receivable contributions for each respective plan year ending.

⁵ A = beginning-of-year market value of assets, B = end-of-year market value of assets, I = investment return during the year

Asset Allocation

The table below shows the amount of funds invested in each account as of June 30, 2018 and June 30, 2019.

Assets Held by Category	June 30, 2018		June 30, 2019	
Cash and Deposits	\$	25,144,878	\$	32,190,794
Receivables				
Contributions	\$	3,512,240	\$	71,612
Investment Income		428,987		299,210
Total Receivables	\$	3,941,227	\$	370,822
Investment				
Government Securities	\$	44,826,689	\$	44,006,934
Fixed Income		98,235,117		109,363,990
Equities		221,246,179		244,582,076
Alternative Investments		13,452,448		14,862,683
Other		1,408,283		0
Total Investments	\$	379,168,716	\$	412,815,683
Total Assets	\$	408,254,821	\$	445,377,299
Payables				
Investment Expense	\$	0	\$	0
Benefits and Withdrawals		985,659		753,319
Administrative Expense		21,827		7,467
Total Payables	\$	1,007,486	\$	760,786
Net Position	\$	407,247,335	\$	444,616,513

Section IV. Solvency Tests for Premium Tax and COLA

Premium Tax Eligibility

West Virginia Code §33-3-14d established a 1% tax on premiums for fire insurance and casualty insurance policies. The proceeds from this tax are used to fund the West Virginia Teachers Retirement System, the Fire Protection Fund for volunteer and part-volunteer fire companies and the Municipal Pensions Security Fund, which is managed by the MPOB. The MPOB allocates funds from the Municipal Pensions Security Fund to each eligible municipality's police and fire fund that is less than 100% funded on an actuarial basis. The funds from the Base Allocation are allocated proportionately to each fire and police fund based on the average monthly number of police officers and firefighters who worked at least 100 hours per month (regardless of whether the police and fire employees participate in the municipality's pension fund or the West Virginia state Municipal Police and Firefighters Retirement System (MPFRS)). The funds from the Excess Allocation are allocated proportionately to each fire and police fund based on the average monthly number of police officers and firefighters who worked at least 100 hours per month and the average monthly number of retired police officers and firefighters (regardless of whether the police and fire employees and retirees participate in the municipality's pension fund or the West Virginia state MPFRS).

West Virginia Code §8-22-19 requires a municipality to deposit into the pension plan the required contributions in accordance with Code §8-22-20 at least on a monthly basis at a rate of one-twelfth of the annual requirement in order to receive the premium tax allocation described above. A municipality may pre-pay this contribution. If the allocable portion of the Municipal Pensions Security Fund is not paid to the pension and relief fund within eighteen months, the portion is forfeited by the pension and relief fund and is allocable to other eligible municipal policemen's and firemen's pension and relief funds in accordance with West Virginia Code §33-3-14d.

Supplemental Benefit (COLA) Eligibility

West Virginia Code §8-22-26a requires that all retirees, surviving beneficiaries, disability pensioners or future retirees receive a Supplemental Pension Benefit (i.e. cost-of-living adjustments, or COLAs) payable on the first day of July, based on a percentage increase equal to any increase in the consumer price index as calculated by the United States Department of Labor, Bureau of Statistics for the preceding year. The COLA shall not exceed 4% per year and is not payable to a retiree until the first day of July after the second anniversary of the retiree's date of retirement. Additionally, the COLA shall only be calculated on the first \$15,000 of the annual benefit paid and on the COLAs accumulated by the retiree since benefit commencement. If, at any time after the COLA becomes applicable, the total accumulated percentage increase in benefits on the allowable amount becomes less than 75% of the total accumulated percentage increase in the consumer price index over that same period of time, the 4% limitation shall be inapplicable until such time as the accumulated COLAs equal 75% of the accumulated increase in the consumer price index. The consumer price index used to determine the COLA is the CPI-U US City Average all items with a base of 1982-1984 equal to 100. The increase is measured as the increase in the annual average of all months from the second prior calendar year to the annual average of all months from the prior calendar year.

The COLA is only payable to the extent that the actuary certifies to the Board of Trustees of the fund the amount of increase in the COLA, if any, which may be paid, and which will preserve the minimum standards for actuarial soundness of the plan as set forth in West Virginia Code §8-22-20. If the actuary certifies that the COLA is payable, the plans must give the COLA.

Granting the COLA is solely based on the solvency test and is not at the discretion of the municipality. The related solvency test is discussed below.

Solvency Tests

There are two solvency tests. The first solvency test is used to determine whether the State premium tax may be allocated to the pension plan for the fiscal year. West Virginia Code §8-22-20 has been historically interpreted to require plans that use the Alternative funding policy to be projected to be solvent in the next 15 years in order to receive the State premium tax allocation. Plans that use the Standard, Optional, or Conservation funding policies, by definition of the funding policy, will always be projected to be solvent in future years. If a plan is not projected to be solvent in the next 15 years, the municipality or employees must make additional contributions in the current fiscal year in order to receive the State premium tax allocation.

The second test is used to determine whether the COLA is payable under West Virginia Code §8-22-26a, which requires the actuary to certify that the minimum funding for actuarial soundness will be preserved after the COLA is granted for the year. The test used to determine if the minimum funding for actuarial soundness will be preserved is a 15-year projection on a closed group basis. For the July 1, 2019 valuation, the 15-year period would end on June 30, 2034. If the assets are greater than \$0 for the first 15 years of the projection, the COLA must be granted. **Please note that the Alternative funding policy is not consistent with generally accepted actuarial principles for funding and continued use of this policy may reduce future solvency levels, even if the current projections do not forecast insolvency.**

Plans Impacted by Solvency Tests

No plans are required to make an additional contribution to meet the solvency test for providing a COLA or for receiving the State premium tax.

Section V. Funding Policy Choices

Background

For plans using the Alternative funding policy, West Virginia Code §8-22-20 requires the actuarial valuation report to provide an evaluation of the plan and to assess advantages of changing to other funding policies. The other funding policies available to plans using the Alternative funding policy are the Optional and Conservation funding policies. The Optional funding policy is defined in West Virginia Code §8-22-20(e)(1) and is available for plan years beginning after January 1, 2010. The Conservation funding policy is defined in West Virginia Code §8-22-20(f)(1) and is available for plan years beginning after April 1, 2011.

The Alternative funding policy does not adhere to actuarial principles generally considered necessary to be classified as a reasonable funding method. One of the primary goals of a reasonable funding method is to contribute annually to the plan the cost of the additional benefits earned by the employees for that year (i.e. the normal cost) plus a level dollar or level percentage of pay amortization of the unfunded accrued liability. The Optional funding policy achieves this goal, but the Conservation funding policy does not. To help each municipality understand the impact of switching, we calculated the projected contributions, liabilities and assets over a 40-year period under two different scenarios in the individual actuarial valuation reports. The first scenario assumes the municipality switches to either the Optional or Conservation funding policies in the next valuation year. The second scenario assumes the municipality switches to either the Optional or Conservation funding policy in the year that the contribution for that funding policy is projected to be the same or less than the contribution under the Alternative funding policy.

Plans using the Standard funding policy are allowed under West Virginia Code §8-22-20 to change to the Optional funding policy. Plans that switch from the Standard funding policy to the Optional funding policy continue to amortize the unfunded liability over the same timeframe. However, plans using the Standard funding policy that switch to the Optional funding policy must close their plan to new hires. The only difference between the Standard funding policy and the Optional from Standard funding policy is that the Optional from Standard funding policy plans do not allow new hires into the plan.

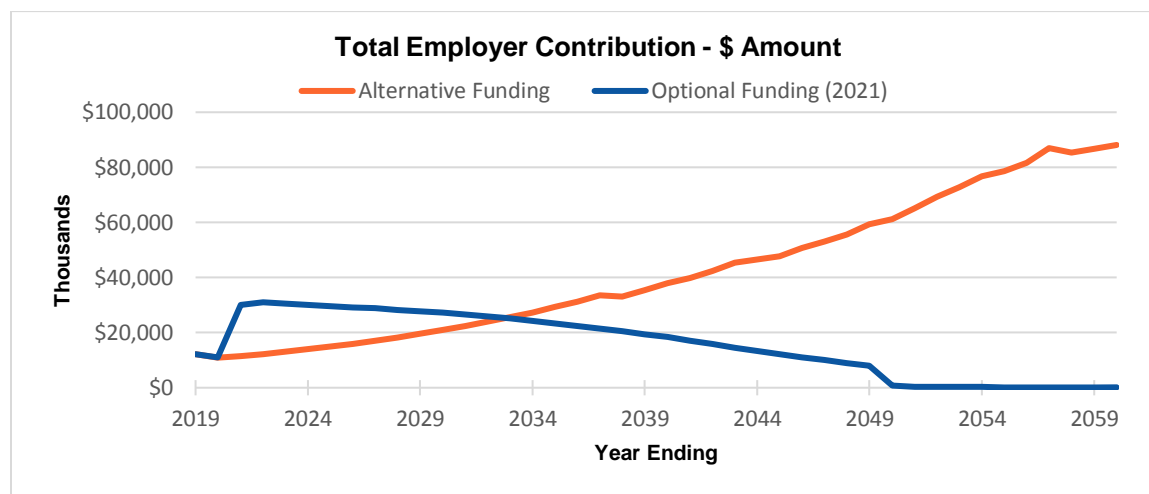
Optional Funding Policy

If the municipality were to choose to switch to the Optional funding policy in lieu of the Alternative funding policy, then the following conditions would apply to the plan:

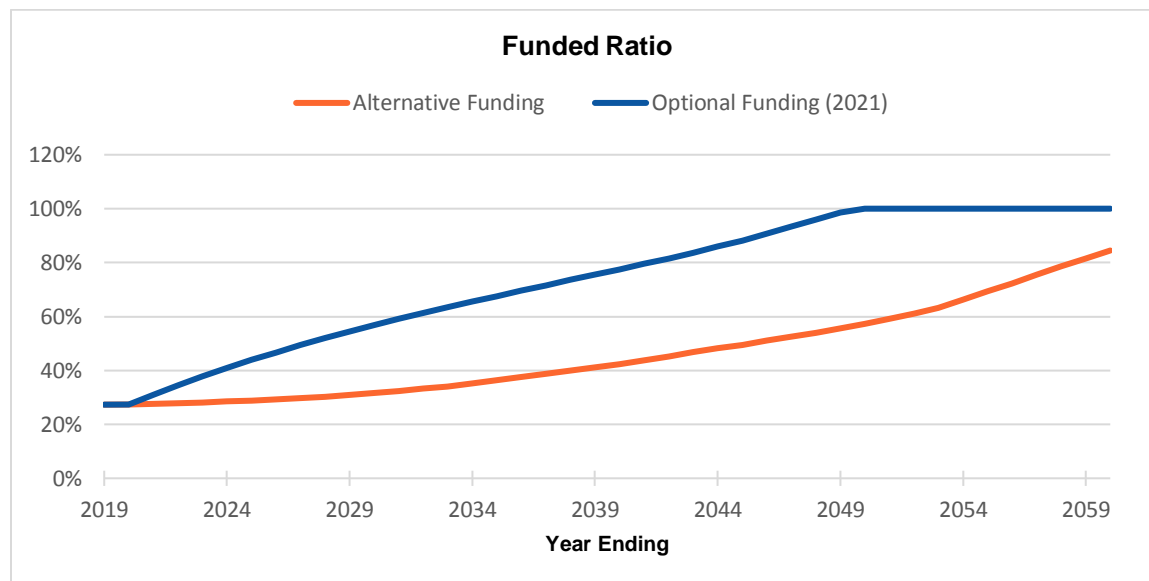
- The required total contribution to the plan, including the premium tax allocation and employee contributions, would equal the normal cost plus a 40-year amortization of the unfunded accrued liability from January 1, 2010 (30.5 years from July 1, 2019).
- The pension and relief fund would close to newly-hired police officers or firefighters after the date of the change and new hires would join the statewide plan - Municipal Police Officers and Firefighters Retirement System (MPFRS).
 - Employer contributions for MPFRS currently equal 8.5% of pay
 - Employee contributions for MPFRS currently equal 8.5% of pay
 - The West Virginia Consolidated Public Retirement Board can change the employer contribution and employee contribution to a percentage of pay between 8.5% and 10.5% as needed to maintain an actuarially sound pension plan

Plans that switch to the Optional funding policy from the Alternative funding policy will likely experience a significant increase in their pension contributions immediately.

The following graph shows the projected contributions for the next 40 years under the Alternative funding policy and under the Optional funding policy if every municipality using the Alternative funding policy switched to the Optional funding policy in 2021.



The following graph shows the projected funded status for the next 40 years under the Alternative funding policy and under the Optional funding policy if every municipality using the Alternative funding policy switched to the Optional funding policy in 2021.



The first graph shows a significant increase in the contributions initially under the Optional funding policy, but a gradually decreasing contribution pattern over the 40 years. The second graph shows an immediate increase in the funded status of the plans as a result of the increased contributions, with a quicker attainment of 100% funded. Despite the higher contributions that result under the Alternative funding policy after 2033, the Alternative funding policy does not achieve 100% funding within the 40-year projection period. Contributing money

to the plan sooner than later will likely reduce total contributions over time as the plan will earn more investment income that will reduce future contribution requirements.

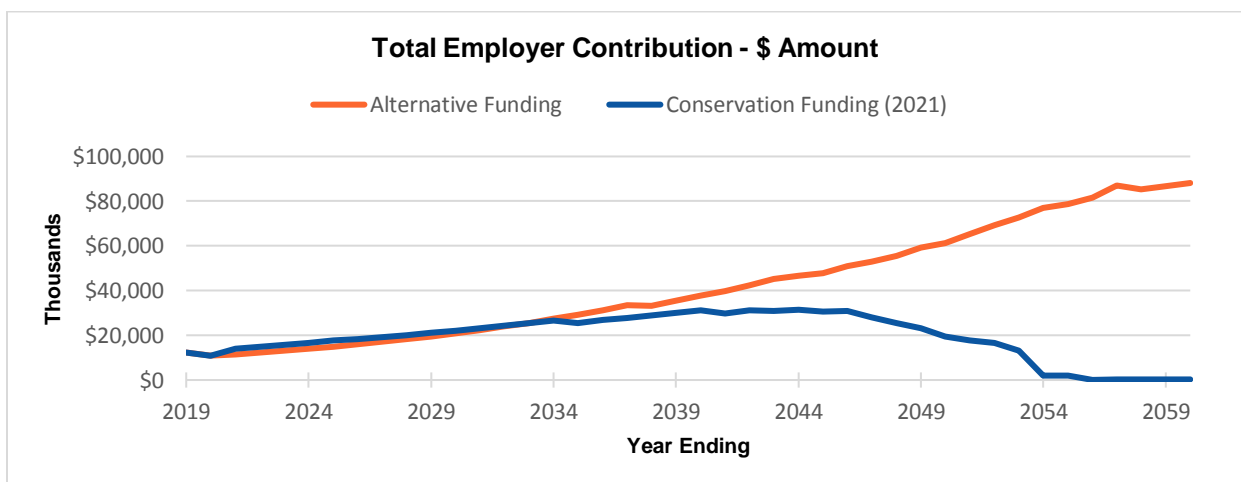
Conservation Funding Policy

If the municipality were to choose to switch to the Conservation funding policy in lieu of the Alternative funding policy, then the following conditions would apply to the plan:

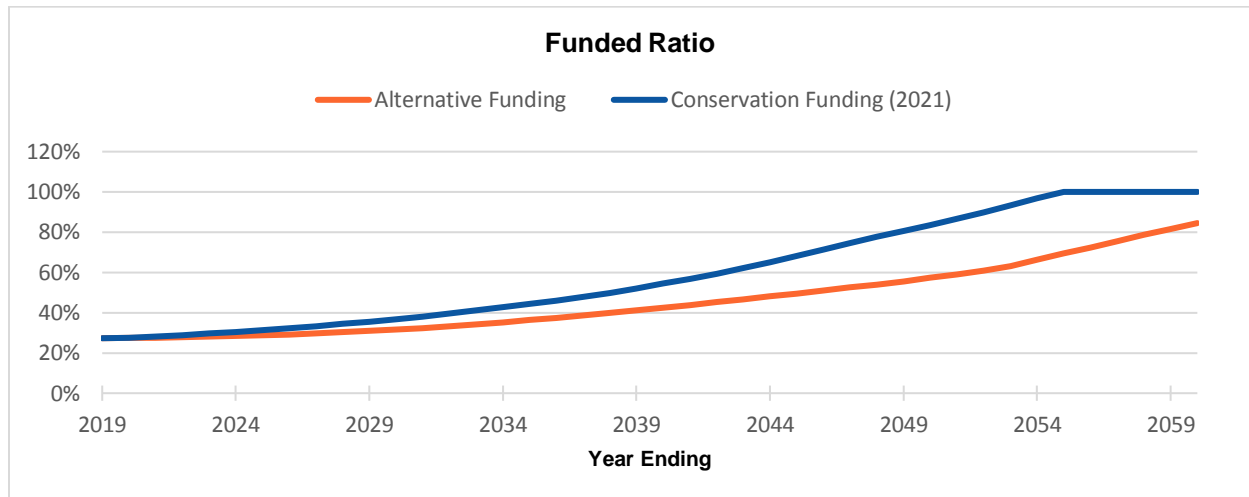
- The plan’s assets would be segregated into two accounts, an accumulation account and a payment account; the accounts would be funded as follows:
 - Until the plan is 100% funded, 1.5% of employee contributions would be deposited into the accumulation account.
 - An actuarially determined portion of the State premium tax allocation would be deposited into the accumulation account equal to the amount needed to fully fund the pension plan liabilities from the accumulation account 35 years from the date the Conservation funding policy was first effective for the plan.
 - The municipality would contribute to the payment account the current year benefit payments and expenses minus the remaining employee contributions and minus any State premium tax not allocated to the accumulation account.
- The pension and relief fund would close to newly-hired police officers or firefighters after the date of the change and new hires would join the MPFRS
 - Employer contributions for MPFRS currently equal 8.5% of pay
 - Employee contributions for MPFRS currently equal 8.5% of pay
 - The West Virginia Consolidated Public Retirement Board can change the employer contribution and employee contribution to a percentage of pay between 8.5% and 10.5% as needed to maintain an actuarially sound pension plan

Plans that switch to the Conservation funding policy will experience a similar contribution pattern as plans that use the Alternative funding policy. The plan will become fully funded quicker mainly because it will be closed to new hires.

The following graph shows the projected contributions for the next 40 years under the Alternative funding policy and under the Conservation funding policy if every municipality using the Alternative funding policy switched to the Conservation funding policy in 2021.



The following graph shows the projected funded status for the next 40 years under the Alternative funding policy and under the Conservation funding policy if every municipality using the Alternative funding policy switched to the Conservation funding policy in 2021.



The first graph shows a slight increase in contributions earlier and a decrease in later years. The second graph shows a steady increase in the funded ratio over time, reaching full funding much earlier than under the Alternative funding policy. The main cause for the decrease in the contribution in later years is due to new hires going into MPFRS, which has the effect of limiting the rate at which the actuarial accrued liability increases on account of future service for active participants. As with the Optional funding method, the Conservation funding policy is projected to achieve 100% funding at some point in the future, while the Alternative funding policy does not achieve 100% funding within the projection period.

Section VI. Deferred Retirement Option Plans (DROPS)

Post-implementation DROP Analysis

West Virginia Code Section §8-22-25a(e) requires MPOB to annually report to the Legislature's Joint Committee on Pensions and Retirement the status of any DROP that has been approved, including any experienced impact on an affected pension and relief fund. Bolton provided MPOB with a post-implementation DROP analysis for Wheeling Fire and St. Albans Fire. Last year we also valued the St. Albans Police DROP. The only DROP participant in the St. Albans Police DROP retired before the valuation date of last year's DROP analysis and therefore a DROP analysis for St. Albans Police was not needed this year.

The main focus of these analyses was to determine whether adding the DROP, as designed, including the additional normal cost payments, has improved or worsened the financial status of the plan. The total impact of the DROP program cannot be determined until all DROP members actually retire (stop working) and therefore exit DROP.

The post DROP analysis focused on five categories of cost and/or savings. The four categories are Payment Trade-off, Drop Member Contributions, Premium Tax Allocation, and Normal Cost Savings due to the delay of new hires that replace DROP retirees and/or additional normal cost contributions required by DROP.

Effective May 18, 2020, HB 4601 changed the categorization of members in DROP for premium tax purposes. Prior to the passage of HB 4601, members in DROP were treated as retirees, meaning they were included in the headcounts used to allocate the *excess* premium tax allocation, but were not included in the headcounts used to allocate the *base* premium tax allocation. HB 4601 changed the WV Code to treat DROP participants as active employees, meaning that, after the effective date, DROP participants are included in the headcount used to determine both the *base* and *excess* premium tax allocations. HB 4601 makes DROPS less expensive than they would have been prior to HB4601.

The following is a description of how each cost component impacts the analysis:

- **Payment Trade-off:** One of two trade-offs will occur when a member decides whether or not to elect a DROP:
 - (1) The member will elect (1) a lower benefit sooner which results in a longer payment period, some of which may be paid in the DROP lump sum versus (2) getting a higher benefit later which results in a shorter payment period.
 - (2) The member will elect his retirement benefit immediately upon attaining retirement eligibility (i.e. never elects DROP) versus electing the DROP immediately after attaining retirement eligibility.

We value the first possible trade-off for members who are expected to work past their normal retirement dates and the second trade-off for members who are expected to retire on their normal retirement date if the DROP did not exist. For members not assumed to retire immediately based on the plan's actuarial assumptions (trade-off (1) above), the trade-off is whether a larger benefit paid later for a shorter period of time is more valuable than a smaller benefit paid earlier

for a longer period of time. Whether the trade-off results in a savings or a cost varies by individual, demonstrating that the expected timing of when a member would retire without the DROP has a significant impact on whether the DROP creates a savings or a loss.

Other assumptions that have a significant impact on whether the payment trade-off results in a cost or savings are the discount rate and salary scale. A lower discount rate and/or a higher salary scale results in the extra accruals being more valuable than the extra payments to the member compared to using a higher discount rate and/or lower salary scale.

For the members expected to retire at the DROP entry date had no DROP been available to encourage them to keep working, the DROP creates a gain because the DROP account does not grant interest credits and the plan saves on the investment return that would have been lost if those payments were no longer in the trust. If the plan has high retirement rates at the age members are first eligible to retire, the second trade-off will occur more often, resulting in a gain. If retirement rates are low without a DROP option, there could be losses.

- **DROP Member Contributions:** This is the value of the extra employee contributions going into the Fund for the years during which the member would have already been retired had there not been a DROP. This provision will always result in a gain to the plan (and savings to the City).
- **Premium Tax Allocation:** This is the loss of premium allocation money for the period when a member is in DROP. Prior to HB 4601, the Fund received more premium tax money (approximately \$5,000) for each active member (whether a member in this Fund or the State plan) than for each retiree. Members who elect DROP were considered retired for premium tax purposes. However, had there not been a DROP, the DROP members would either (a) still be active or (b) have retired and we assume new members would have been hired as a result. In either scenario, these members or their replacements would have been considered active for premium tax purposes but, because they elected DROP, the members in DROP were considered retired for allocations prior to the September 2020 allocation (the first allocation impacted by HB 4601). Additionally, for scenario (b), there would be two individuals counted for premium tax purposes rather than the one individual who entered DROP and was considered a retiree for premium tax purposes: the original member who retired would be counted as a retiree and the new hire replacement would be counted as an active. While the DROP increases the premium tax allocation available to the other plans covered by MPOB, it decreases the premium tax allocation available to this Fund. The potential losses are shifted one year based on plan procedures.
- **Normal Cost Savings:** If a member works longer because of DROP, the hiring of a new employee is theoretically delayed. In an open plan, such a scenario would result in Normal Cost savings. For a closed plan, there is no savings to the plan because all new hires are required to join the State plan. However, if the DROP provisions require the City to pay the Normal Cost rate on the payroll for members in DROP, there will be a savings to the plan.



The following table summarizes the cost of the DROP as of July 1, 2019 for the plans that have a DROP provision as of July 1, 2019.

Impact Item	St. Albans Fire	Wheeling Fire
Payment Trade-off	199,623	(27,507)
Drop Member Contributions	(31,490)	(148,935)
Premium Tax Allocation	66,751	229,973
Delay of New Hires	<u>(105,941)</u>	<u>(937,788)</u>
Net (Gain)/Loss	128,943	(884,257)

Section VII. Conclusions and Recommendations

Conclusions

The funded status of the collective plans improved and the contributions to the plans increased. The following are some key highlights of the results of the July 1, 2019 valuations:

- The funded ratio improved from 26% as of July 1, 2018 to 28% as of July 1, 2019. The funded ratio for plans using the Optional from Standard policy is the highest, followed by the Standard policy, Optional from Alternative policy, Alternative policy, and plans using the Conservation policy having the lowest funded ratio
- The unfunded liability decreased by approximately \$5 million from \$1.166 billion to \$1.161 billion, a decrease of 0.4%
- Total recommended contributions including estimated employee contributions increased approximately \$0.7 million from \$78.4 million to \$79.0 million, an increase of 0.8%
- Net municipality recommended contributions increased \$0.2 million from \$52.5 million to \$52.7 million, an increase of 0.5%
- The State premium tax allocation increased by approximately \$0.5 million from \$19.6 million to \$20.0 million, an increase of 2.3%
- Liabilities increased 2.1%. In addition to the inherent increases attributable to a year of benefit accruals, the liability increase also includes an experience loss of approximately 0.5% and was partially offset by a discount rate assumption change gain of approximately 1.4%
- Assets increased 9.2%, with a total return on assets of 5.9%, slightly above the liability weighted average discount rate of 5.00%
- The return on assets for the fiscal year ending June 30, 2019 for each plan ranged from 1.9% to 10.4%
- The gross normal cost decreased 3.8% which is a result of (1) discount rate increases for all 10 plans that experienced discount rate changes and (2) the declining normal cost (in dollars) for some of the plans closed to new entrants.
- The number of active employees covered by all the plans decreased 3.8% from 1,430 to 1,376.
- The plans using the Standard and Optional funding policies are expected to have a more level contribution pattern in the future than funds using the Alternative and Conservation funding policies, resulting in a more sustainable plan. Municipalities funding under the Alternative and Conservation funding policies will most likely experience contribution requirements that are a larger percentage of their annual revenues each year, which could result in an unsustainable funding requirement in the future for some municipalities.

Recommendations

The following are the actuaries' recommendations to the MPOB for changes to the pension plans:

1. Discourage the use of the Alternative and Conservation funding policies as these funding policies result in expected future contributions which are much higher than current contributions and are expected to create a larger burden in the future for municipalities that fund under these policies;

2. The legislature should change the State Code to allow municipalities that use the Conservation funding policy to switch to the Optional funding policy;
3. Consider implementing a minimum amortization period for the Standard and Optional funding policies of 15 to 20 years, including a layered amortization approach. Currently these funding policies use an amortization policy in which a single unfunded liability base, attributable to all sources, including investment experience, demographic gains and losses, assumption changes, and plan changes, is amortized over a set number of years (for the July 1, 2019 valuation, 12 years for Standard plans and Optional from Standard plans, and 30.5 years for Optional from Alternative plans) which decreases each year, until eventually all unexpected changes in the unfunded liability are recognized immediately. Given that the funded position of the plans may experience material changes due to investment experience, demographic experience, assumption and plan changes, changes in the unfunded liability could have a significant impact on the required contributions using this policy, especially for years in which the amortization period has dwindled to only a few years or immediate recognition. To help mitigate these large fluctuations, we recommend implementing layered amortization bases with an initial amortization period of 10 to 20 years, such that new bases are created each year for changes in the unfunded liability and are recognized over a minimum number of years. We understand the Board is considering a change to the amortization methods which will need to be presented to the legislature for a change to the WV Code.
4. Review the feasibility of pooling investments for these plans to reduce investment expenses and increase investment returns.



Section VIII. Participant Information

Participant Summary

The following table summarizes the counts, ages and benefit information for plan participants used in the prior and current valuations.

	July 1, 2018	July 1, 2019
1. Actives		
a. Number	1,430	1,376
b. Average Age	39.5	39.9
c. Average Service	12.5	13.0
d. Average Salary	\$ 57,127	\$ 59,057
2. Retirees		
a. Number	1,389	1,399
b. Average Age	66.6	66.8
c. Total Annual Benefits	\$ 50,581,817	\$ 52,168,598
3. Survivors		
a. Number	518	525
b. Average Age	73.7	73.5
c. Total Annual Benefits	\$ 7,749,547	\$ 8,130,684
4. Disableds		
a. Number	276	272
b. Average Age	61.2	61.7
c. Total Annual Benefits	\$ 6,767,766	\$ 6,832,995
5. Deferred Vesteds		
a. Number	32	31
b. Average Age	46.7	47.1
c. Total Annual Benefits	\$ 1,200,689	\$ 1,135,198
6. Members Owed Refunds		
a. Number	40	50
b. Average Age	34.9	35.3
c. Total Refunds Owed	\$ 618,942	\$ 921,392

Active Age/Service Distribution Including Compensation

Shown below is the age and service distribution of active participants for all active members who currently participate in a local pension plan. The compensation shown is the average projected pay for the plan year beginning July 1, 2019.

Credited Service as of July 1, 2019

Participant Age	Credited Service as of July 1, 2019							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up	
Under 25	66	-	-	-	-	-	-	66
	47,481	-	-	-	-	-	-	47,482
25 - 29	113	40	-	-	-	-	-	153
	50,208	53,230	-	-	-	-	-	50,998
30 - 34	58	75	65	-	-	-	-	198
	49,732	54,203	57,477	-	-	-	-	53,968
35 - 39	26	59	128	32	-	-	-	245
	48,982	53,070	58,952	61,617	-	-	-	56,826
40 - 44	7	22	99	104	38	-	-	270
	49,949	55,067	59,067	62,265	64,908	-	-	60,559
45 - 49	2	7	43	99	116	28	-	295
	55,144	54,662	58,339	62,251	71,009	74,095	-	66,021
50 - 54	-	-	3	47	36	19	4	109
	-	-	51,741	60,251	68,287	72,198	66,079	64,967
55 - 59	1	-	2	3	14	8	3	31
	52,825	-	57,404	69,603	64,361	76,751	85,314	69,272
60 - 64	1	-	-	-	1	1	6	9
	53,220	-	-	-	69,915	78,185	76,742	73,530
65 & Up	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Totals	274	203	340	285	205	56	13	1,376
	49,385	53,791	58,553	61,933	68,941	73,904	75,439	59,057

Averages

Age	39.9
Service	13.0

Section IX. Summary of Plan Provisions

Plan Year

July 1 – June 30.

Eligibility to Participate

All compensated employees of the relevant Fire or Police Department are eligible to participate in the Firemen's or Policemen's Pension and Relief Fund (Plan). If the plan uses the optional or conservation funding policies, only members hired prior to the date of the change to either one of these policies are eligible to participate in the Plan.

Credited Service

The number of years that the member has contributed to the employees' retirement and benefit plan.

Absence from service because of sickness or injury for a period of two years or less shall not be construed as time out of service.

Military Service — Any current member who has been on qualified military service in the armed forces of the United States with an honorable discharge may, within six months from his or her date of discharge, be given credit for continuous service in the paid police or fire department.

A member may receive retirement eligibility service (i.e. eligibility towards the 20 years of service for normal retirement) for qualified military service only if the military service was prior to November 18, 2009 or the member repays, without interest, member assessments that were missed during the period of military service.

Any member who has served in active duty with the armed forces of the United States, whether prior to or subsequent to becoming a member of a paid police or fire department, shall receive an additional 1% of Average Annual Compensation for each full continuous year so served in active military duty, up to a maximum of an additional 4%.

Average Annual Compensation

The average of the three twelve-consecutive-month periods of employment in which the member received the highest salary or compensation. While the months in each twelve-month period need to be consecutive, the three "twelve-consecutive-month periods" do not need to be consecutive.

Each twelve-consecutive-month annual compensation is limited to 120% of the *Average Adjusted Salary*, which is the average of the Adjusted Salary for the two consecutive twelve-consecutive-month periods immediately preceding the twelve-consecutive-month period used in determining benefits.

The *Adjusted Salary* for any preceding year is the respective preceding year total salary multiplied by the ratio of base salary of the year used in determining benefits to the base salary from the respective preceding year. A preceding year is either the "year one" which is the second twelve consecutive month period preceding the twelve-consecutive-month period used to determine benefits or "year two" which is the twelve-consecutive-month period



immediate preceding the twelve-consecutive-month period used to determine benefits.

Employee Contributions

Participating employees hired before January 1, 2010: Range from 7.0% to 9.5% of compensation depending on the municipality.

Participating employees hired on or after January 1, 2010: 9.5% of compensation.

Employer Contributions

The municipality has elected to contribute the minimum employer contribution under the Alternative funding policy.

Normal Retirement Eligibility

Members are eligible at the earlier of age 50 with 20 years of credited service or age 65.

Normal Retirement Benefit

The annual retirement benefit equals the sum of:

- 60% of average annual compensation, for service up to 20 years; not less than \$6,000
- 2% for each year of service between 20 and 25 years
- 1% for each year of service between 25 and 30 years
- Employees serving in the military are eligible for an additional 1% of average annual compensation for each year of military service up to four years.

The maximum benefit is limited to 75% of average annual compensation.

Normal Form

Life annuity with a 60% spouse's survivor benefit. The benefit payable to the spouse as of the member's date of death is determined by taking 60% of the member's benefit at the member's retirement date and indexing that amount to the date of death using the COLA methodology described in the Cost of Living Adjustment section below. No other optional forms are allowed under the Plan.

Disability Retirement Eligibility

Members are eligible after earning five years of service. There is no years of service requirement if disability is service related. Disability is defined in WV Code §8-22-23a as the inability to perform adequately the job duties required of the member.

Disability Retirement Benefit

The monthly disability benefit equals the sum of:

- 60% of monthly salary at disability, but not less than \$500, plus
- Employees serving in the military are eligible for an additional benefit of 1% of monthly salary at disability for each year of military service up to four years.

Disability benefits, when aggregated with monthly state workers compensation benefits, shall not exceed 100% of the member's monthly compensation at the time of disability. Benefits continue for life or until recovery.

Disability pensions are offset by \$1 per every \$3 of other income. There is no offset if total other income is \$18,200 (as of 2019, indexed by state minimum wage for years after 2019) or less.

Termination Benefits

Any member who terminates employment prior to retirement and has at least 20 years of credited service will be entitled to a pension benefit equal to the normal retirement benefit commencing at age 50.

Any member who terminates employment prior to retirement with fewer than 20 years of credited service will be entitled to a refund of employee contributions without interest.

Refunds: Any member who terminates from their department without receiving a retirement pension shall be refunded all deductions made from his salary, without interest. Any member who receives such a refund and subsequently wishes to reenter (available only if the municipal plan is still open as of such date) the department must repay to the pension plan all sums refunded with interest at the rate of 8% per annum.

Death Benefit Eligibility

Members are eligible after earning five years of service. There is no years of service requirement if death is service related. Retirees and terminated vested participants are also eligible.

Death Benefit

The benefit is equal to 60% of the participant's benefit, but not less than \$300 per month, payable to the spouse until death or remarriage.

Other dependents (children, parents, brothers and sisters) are also eligible for death benefits. To each dependent:

- child: 20% of the participant's benefit until the child attains 18 or marries;
- orphaned child: 25% of the participant's benefit until the child attains 18 or marries;
- parent: 10% of the participant's benefit for life,
- brother or sister: 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.

The total of all benefits cannot be more than 100% of the participant's salary. In no case shall the payments to the surviving spouse and children be reduced below 65 percent of the total amount paid to all dependents.

Supplemental Benefit (Cost of Living Adjustment – COLA)

All retirees, surviving beneficiaries and disability pensioners are eligible for automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefits equal the percentage increase in the Consumer Price Index, limited to 4% (2% for some disability retirees), multiplied by the sum of the allowable amount, which is the first \$15,000 of the total annual benefits paid and the accumulated supplemental pension amounts for prior years.

Changes in Plan Provisions Since Prior Valuation

None.

Section X. Actuarial Methods and Assumptions

Actuarial Cost Method

The actuarial valuations use the Entry Age Normal cost method calculated on an individual basis with level percentage of pay normal cost. Past service liability is allocated from the imputed date of hire, taking into account transferred and purchased service.

West Virginia Funding Policies

Under West Virginia Code §8-22-20(c)(1), there are four funding policies available for plan sponsors. Those funding policies are summarized below:

- **Standard Funding Policy:** Employer contributions equal the net employer normal cost, plus an amortization of the unfunded actuarial liability, less the State premium tax allocation applicable to the plan year. The amortization is based on a 40-year closed period from July 1, 1991, using a level dollar amortization (12years remaining as of July 1,2019). The Standard funding policy is consistent with generally accepted actuarial standards of practice.
- **Alternative Funding Policy:** Employer contributions equal 107% of the prior year's employer contribution. The Alternative funding policy is not consistent with generally accepted actuarial standards of practice because the policy does not reflect emerging experience gains and losses and may not produce an actuarially sound pattern of contributions or funded ratio. The State premium tax allocation is contributed in addition to the employer contributions.
- **Optional Funding Policy:** Allows plan sponsors using either the Standard funding policy or Alternative funding policy to close the current local Plan to new hires and contribute to the Plan on an actuarially determined basis. The actuarially determined employer contribution is equal to the net employer normal cost, plus a level dollar amortization of the unfunded actuarial liability, less the State premium tax allocation applicable to the plan year. The closed amortization period as of July 1, 2019, is 12 years for sponsors who previously used the Standard funding policy and30.5 years for sponsors who previously used the Alternative funding policy. Members hired after the adoption date of the Optional funding policy are covered in the statewide pension fund – The Municipal Police Officers and Firefighters Retirement System (MPFRS).
- **Conservation Funding Policy:** Allows plan sponsors using the Alternative funding policy to close the current local Plan to new hires and contribute to the plan on a pay-as-you-go basis. Sponsors using the Conservation funding policy are required to assign a portion of the State premium tax allocation and member contributions to an accumulation account that is projected to grow to 100% of the remaining actuarial liabilities at the end of a 35-year projection period. Members hired after the adoption date of the Conservation funding policy are covered in the statewide pension plan – MPFRS. This policy is not consistent with generally accepted actuarial principles.

Amortization Method

Amortization Policies	
Alternative Plans and former Alternative Plans that selected the Conservation Policy	For GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from January 1, 2010 – 30.5 years remaining as of July 1, 2019).
Standard Plans and former Standard Plans that selected the Optional Policy	For funding and GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from July 1, 1991 – 12 years remaining as of July 1, 2019).
Former Alternative Plans that selected the Optional Policy	For funding and GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from January 1, 2010 – 30.5 years remaining as of July 1, 2019).

Asset Method

Market value.

Projection Methods

The projections of future assets, liabilities, funded status and contributions are based on the following assumptions:

- Compensation will increase and members will leave the active workforce according to the actuarial valuation assumptions.
- For the open group projections, each active member leaving the workforce will be replaced with a new entrant so that the total number of active members remains the same throughout the projection period. The assumption made regarding the demographic makeup of new entrants is described below.
- For closed group projections, new hires that replace active members who retire, terminate, die or become disabled are not assumed to enter the Plan.
- The sponsor contributes the amount determined by the applicable funding policy each year.
- For plans that are less than 100% funded as of the valuation date, the contribution during the projection period is capped at the amount needed to achieve and maintain a funded status of 100%.
- Assets grow at the assumed rate of return (discount rate).
- Non-vested members receive a refund of their accumulated employee contribution account balance during the year in which they terminate.

Data Corrections

We understand that the MPOB conducts compliance audits throughout the year. From time to time, the MPOB identifies potential calculation errors and notifies us of these errors as they discover them. We do not reflect the corrections of these errors until the MPOB conducts a thorough review of the error and directs a correction method to the plan. We use the data that was submitted to us by the plans' representatives. We do not audit the data but we do conduct several reasonableness tests and ask questions accordingly. We do not make any adjustments for identified errors until instructed to do so by MPOB. If a correction is made subsequent to the issuance of the actuarial valuations, the corrections are reflected in the following year's valuation.

Special Funding Situations

There were four funds where the cities approved the continued overpayment of miscalculated benefits. These four funds are Huntington Fire, Huntington Police, Morgantown Fire and Morgantown Police. For these four funds, we calculate the contribution under the relevant funding policy as if the payments were corrected and add an additional contribution for the expected overpayments for the current plan year on a pay-as-you-go basis pursuant to West Virginia Code 8-22-27a(d).

Basis for Selection of Actuarial Assumptions

Unless otherwise noted, the actuarial assumptions used in the valuation were set by the MPOB on the basis of an actuarial experience study prepared in 2016 covering the period July 1, 2009 through July 1, 2014. Bolton is not responsible for the selection of these assumptions, nor did we advise on the selection of these assumptions. These assumptions are, in the opinion of the actuaries signing this report, reasonable for the intended purpose.

Discount Rate

The following table outlines the factors used to determine the discount rate:

Funded Ratio as of Valuation Date ⁶	Liquidity Ratio ⁷	Equity Exposure ⁸	Projected Funded Ratio after 15 Years ⁷	Discount Rate
60% or more	10	50% or more	70% or more	6.5%
40% or more	8	40% or more	60% or more	6.0%
30% or more	6	30% or more	50% or more	5.5%
15% or more	4	N/A	40% or more	5.0%
Less than 15%	N/A	N/A	15% or more	4.5%
Less than 15%	N/A	N/A	Less than 15%	4.0%

⁶ Funded ratios based on a 6.0% investment return assumption for plans using an actuarially sound policy (standard or optional) and a 5.5% investment return assumption for other plans (Alternative or Conservation).

⁷ Liquidity ratio equals assets as of the actuarial valuation date divided by expected benefit payments for the year.

⁸ Based on target allocation percentage outlined in the investment policy.



Premium Tax Allocation

The premium tax allocation is projected using the following methodology:

- (1) The Base Allocation is a fixed amount equal to \$8,709,689 in all future years. This amount is allocated to each individual pension and relief fund in proportion to the number of eligible members, which includes active members covered in either the pension and relief fund or the statewide plan, Municipal Police Officers and Firefighters Retirement System (“MPFRS”). We assume that the percentage of eligible members of the Pension and Relief Fund and MPFRS for a single municipal plan to the total eligible members for all municipalities remains constant throughout the projection period.
- (2) The Excess Allocation is equal to the excess of the current year premium tax assigned to all pension and relief Funds over the total Base Allocation. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible active and retired members covered in either the pension and relief fund or the MPFRS.
- (3) We have assumed all pension and relief funds will make the minimum statutory contribution requirement and will receive 100% of the total allocation assigned to the individual plan until they are 100% funded. Once a plan attains a funded ratio of at least 100%, the premium tax that would have been allocated to the plan had the funded ratio been lower than 100% is reallocated in subsequent years to all remaining plans that are less than 100% funded.
- (4) The total available premium tax allocation, net of expenses, as of September 1, 2020, includes a Base Allocation of \$8,709,689, an Excess Allocation of \$11,258,890, and an Expired Premium Tax Allocation of \$366,419.
- (5) For the plan year ending June 30, 2020, all Pension and Relief Funds reported a total of 1,710.82 eligible active members and 2,174.68 eligible retired members. All Plans are eligible to receive a premium tax allocation for the fiscal year ending June 30, 2020 unless they are over 100% funded as of July 1, 2019
- (6) The total premium tax allocation is assumed to increase by 2.75% in calendar years ending on and after 2021.

Administrative Expenses

Total administrative expenses for the fiscal year are equal to the expense assumption used for the prior valuation, increased by 2.75% for inflation. We defined our expense assumption based on discussions with MPOB and currently available information. Future expenses are assumed to increase by the general inflation assumption and are adjusted for headcount.

Salary Increases

General Inflation: 2.75% *plus*

Wage Inflation Increment: 1.00% *plus*

Service-based Increase:

Years of Service	Increase
1	20.00%
2	6.50%
3	3.50%
4	2.75%
5-9	2.50%
10-29	2.00%
30-34	1.25%
>34	0.00%

Cost of Living Increase in Benefits

2.75% on first \$15,000 of Annual Benefit and on the accumulated supplemental pension amounts for prior years. Assumed to be payable to all members receiving payments.

Inflation

2.75%, compounded annually.

Mortality

Pre-Retirement

RP-2014 Blue Collar Healthy Employee⁹ projected generationally using scale MP-2014 two-dimensional mortality improvement scales.

Post Retirement

RP-2014 Blue Collar Healthy Annuitant projected generationally using scale MP-2014 two-dimensional mortality improvement scales.

For Disabled Participants: RP-2014 Blue Collar Healthy Annuitant set forward four years, projected generationally using scale MP-2014 two-dimensional mortality improvement scales.

Projections with MP-2014 to the valuation date represent current mortality and projections using scale MP-2014 beyond the valuation date represent future mortality improvement.

⁹ Assumes 10% of deaths are duty-related and 90% are non-duty related.

Termination of Employment

Sample termination rates are as follows:

Age	Rates
25	9%
35	4%
45	2%
50	0%

This assumption is based on an experience study conducted by GRS in 2015.

Retirement Rates

Members need a minimum of 20 years of service in order to be eligible for normal retirement. The sample retirement rates below are for years of service greater than or equal to 20 years of service:

Age	Rates
50	45%
51-55	30%
56-59	35%
60	100.0%

Terminated-vested members (members who terminate employment after attaining 20 years of service but prior to commencing pension benefits) are assumed to retire at age 50.

Disability Rates

Sample disability rates are as follows:

Age	Rates ¹⁰
30	0.22%
40	0.50%
50	0.79%

Marital Status

90% assumed to be married with wives 3 years younger than husbands. Widows are not expected to re-marry in the future.

Non-Vested Terminations

We value non-vested terminations based on the amount of their employee contribution account balance, which is assumed to be paid on the valuation date for current non-vested terminated members and on the termination date for future non-vested terminations.

¹⁰ Assumes that 60% of disabilities are duty related and 40% are non-duty related. Also assumes that 10% of non-duty disabled members receive a 20% reduction in benefits due to gainful employment.

Form of Payment

Benefits are assumed to be paid as a life annuity with a 60% spousal death benefit taking into account the re-indexing of the spouse's supplemental benefit as provided in WV Code §8-22-26a.

Child Beneficiaries

Future survivor widow benefits are loaded by 12% to estimate the impact of benefits provided to survivor children. The load assumes 90% of members are married with two children at time of death, and benefits for each child are paid for approximately 8 years.

Open Group Projection New Hire Profile

The active population is projected to be stable under the open group projections meaning that the active population remains constant over the projection period resulting in any terminations being replaced by a new hire. The profile for new hires contains five separate records, with each record containing the average date of birth, compensation, and percentage male of all actives who have two years of service or less within the 53 plans covered by the MPOB. The five records were created using compensation for the fiscal year ending on the valuation date. Each of the five records corresponds to a different compensation band. The lowest band represents salaries under \$35,000, the highest band represents salaries above \$50,000, and the middle bands represent the \$5,000 increments between \$35,000 and \$50,000. The beginning salary for new entrants hired after the current plan year is equal to the new entrant profile salary increased by the general wage inflation assumption of 3.75% for each year between the new entrant's assumed date of hire and the valuation date.

Changes in Methods/Assumptions Since Prior Valuation

Ten municipalities had a change in their discount rate, but the method for selecting the discount rate did not change.

Starting with this July 1, 2019 valuation, past benefit overpayments that were approved to continue by the city of Huntington for the Fire and Police plans are funded on a pay-as-you-go basis pursuant to West Virginia Code 8-22-27a(d)..

Section XI. Glossary

Actuarial Accrued Liability (AAL)

The difference between the Actuarial Present Value of Future Benefits and the Actuarial Present Value of Future Normal Costs or the portion of the present value of future benefits allocated to service before the valuation date in accordance with the actuarial cost method. Represents the present value of benefits expected to be paid from the plan in the future allocated to service prior to the date of the measurement.

Actuarial Asset Valuation Method

The method of determining the value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value that recognizes investment gains and losses over a given period of time (rather than immediately) in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially determined contribution (ADC).

Actuarial Cost Method

A procedure for allocating the Actuarial Present Value of Future Benefits and the Actuarial Present Value of Future Normal costs and the Actuarial Accrued Liability. Also known as the “funding method”. Examples of actuarial cost methods include Aggregate, Entry Age Normal, Projected Unit Credit, and Pay-As-You-Go.

Actuarial Present Value of Future Benefits

The actuarial present value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members entitled to either a refund of member contributions or a future retirement benefit. It is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Aggregate Cost Method

An actuarial cost method that spreads the cost of all future benefits in excess of plan assets as a level percentage of future salary or service. The Actuarial Accrued Liability is set to the value of assets in this method.

Annual Determined Contributions of the Employer(s) (ADC)

The employer’s target or recommended periodic contribution to a pension plan, calculated in accordance with assumptions and methods that conform with the Actuarial Standards of Practice. The ADC replaced the annual required contribution (ARC) when GASB 27 was replaced by GASB 68.

Cost-of-Living-Adjustment (COLA)

A periodic increase in the amounts calculated using the plan’s basic benefit formula to account for the future effects of inflation which reduce the purchasing power of the calculated benefits.

Covered Group

Plan members included in actuarial valuation.

Demographic Assumptions

Assumptions regarding the future population of pension participants, including retirement, termination, disability and mortality assumptions. Demographic assumptions also include those relating to merit pay increases, marital status, and new hires.

Economic Assumptions

Assumptions regarding future economic factors, including inflation, investment returns, COLA, salary improvement, change in average wages, and changes in Social Security benefits.

Employer's Contributions

Contributions made in relation to the ADC. An employer has made a contribution in relation to the ADC if the employer has (a) made payments of benefits directly to or on behalf of a retiree or beneficiary, (b) made premium payments to an insurer, or (c) irrevocably transferred assets to a trust, or an equivalent arrangement, in which plan assets are dedicated to providing benefits to retirees and their beneficiaries in accordance with the terms of the plan and are legally protected from creditors of the employer(s) or plan administrator.

Entry Age Normal (EAN) Cost Method

An actuarial cost method that spreads the cost for each individual's expected benefits over their career, either as a level percentage of pay or service. The Actuarial Accrued Liability is the accumulated value of all past normal costs, and the unfunded accrued liability (surplus) is the excess of the Actuarial Accrued Liability over the value of assets.

Expenses

Plan expenses paid from the plan's assets (rather than directly by the employer) are divided into administrative and investment-related expenses.

Funded Ratio

The actuarial value of assets expressed as a percentage of the plan's Actuarial Accrued Liability.

GASB

Government Accounting Standards Board.

GASB No. 67 and GASB No. 68

These are the government accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems while Statement No. 67 sets the rules for the systems themselves.

Investment Return Assumption or Investment Rate of Return (Discount Rate)

The assumed rate of future investment earnings on the plan's assets, reflecting the current investment policy and expected future economic conditions. This rate is used to adjust, or discount, a series of future payments to reflect the time value of money and show future amounts in today's dollars.

Level Dollar Amortization Method

Amortization payments are calculated so that they are a level dollar amount over a given number of years.

Level Percentage of Projected Payroll Amortization Method

Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases due to inflation. In dollars adjusted for inflation, the payments can be expected to remain level (disregarding changes due to future actuarial experience differing from expectations).

Normal Cost

That portion of the Actuarial Present Value Future Benefits and expenses which is allocated to a valuation year by the actuarial cost method.

Payroll Growth Rate

An actuarial assumption with respect to future increases in total covered payroll attributable to inflation; used in applying the level percentage of projected payroll amortization method.

Plan Members

The individuals covered by the terms of a pension plan. The plan membership generally includes employees in active service, terminated employees who have accumulated benefits but are not yet receiving them, and retired employees and beneficiaries currently receiving benefits.

Post-Employment

The period between termination of employment and retirement as well as the period after retirement.

Salary Improvement

An actuarial assumption regarding the increase in employees' salaries, reflecting cost-of-living, merit and longevity increases.

Solvency Tests

The solvency tests apply to plans using the Alternative funding policy. The solvency test is deemed to pass if assets are projected to be above \$0 for the next 15 years. This projection is done on an open group basis for the premium tax allocation and closed group basis for granting the COLA. The rationale for using an open group basis for the premium tax and a closed group basis for the COLA is that the open group projection is an easier threshold to meet compared to the closed group test. Since the premium tax helps improve the funded status of the plan and the COLA increases the liabilities for the plan, the easier test should apply to the event that improves the funded status and the harder test should apply to the event that lowers the funded status of the plan.

Unfunded Actuarial Accrued Liabilities

The excess of the Actuarial Present Value of Future Benefits as of the date of a pension plan valuation, over the sum of (1) the actuarial value of the assets of the plan and (2) the Actuarial Present Value of Future Normal Costs determined by any of several actuarial cost methods. For plans that explicitly define an Actuarial Accrued Liability, this amount equals the excess of the Actuarial Accrued Liability over the actuarial value of assets.

Vested Plan Benefits

All benefits to which current participants have a vested right based on pay and service through the valuation date. A participant has a vested right to a benefit if he/she would still be eligible to receive that benefit if employment terminated on the valuation date.