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

REVISED Consolidated Actuarial Valuation Report for the Year Beginning July 1, 2018

Municipal Pensions Oversight Board

Bolton

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October 26, 2020

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

Re: REVISED Consolidated Actuarial Valuation Report for the Year Beginning July 1, 2018

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. This report revises the results presented in our previous July 1, 2018 consolidated report, which was dated April 2, 2020, primarily to account for updates to the Williamson Fire and Police pension plans and the associated impacts to the summaries of total results for all plans.

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. Sections 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, 2020, 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, 2020
- The plan's eligibility to provide supplemental benefits for the plan year beginning July 1, 2020
- 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.

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

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Section I. Executive Summary

Background

Bolton has prepared a July 1, 2018 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 Pensions 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.

This report revises the results presented in our previous July 1, 2018 consolidated report, which was dated April 2, 2020, primarily to account for updates to the Williamson Fire and Police pension plans and the associated impacts to the summaries of total results for all plans. 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 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
Employee Contributions	$ 6.0	$ 6.1	$ 6.2	$ 6.2	$ 6.3
Net City Contributions	$ 41.2	$ 46.7	$ 51.9	$ 50.1	$ 52.5
Premium Tax Allocation	$ 16.8	$ 17.7	$ 18.2	$ 18.5	$ 19.6
Total Contribution	$ 64.0	$ 70.5	$ 76.3	$ 74.8	$ 78.4

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, 2014	July 1, 2015	July 1, 2016	July 1, 2017	July 1, 2018
Accrued Liability	$ 1,272.9	$ 1,481.5	$ 1,503.8	$ 1,514.8	$ 1,572.8
Actuarial Asset Value (Market Value)	$ 308.0	$ 321.2	$ 329.4	$ 369.9	$ 407.2
Unfunded Accrued Liability	$ 964.9	$ 1,263.3	$ 1,174.4	$ 1,144.9	$ 1,165.5
Funding Percentage	24%	22%	22%	24%	26%

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 2016	FYE 2017	FYE 2018	FYE 2019	FYE 2020
1. Normal Cost with Interest	$ 28.2	$ 37.5	$ 37.7	$ 37.4	$ 36.7
2. Employee Contributions	$ 6.0	$ 6.1	$ 6.2	$ 6.2	$ 6.3
3. Net Normal Cost (1. - 2.)	$ 22.2	$ 31.4	$ 31.5	$ 31.2	$ 30.3
4. Net Normal Cost as a % of Payroll	29%	41%	41%	41%	38%
5. Employer Contribution plus State Premium Tax	$ 58.0	$ 64.4	$ 70.1	$ 68.6	$ 72.0
6. Unfunded Liability	$ 964.9	$ 1,263.3	$ 1,174.4	$ 1,144.9	$ 1,165.5
7. Net Payment Toward Unfunded Liability (5. - 3.)	35.8	33.0	38.6	37.4	41.7
8. Percent of Unfunded Liability Expected to be Paid (7. / 6.)	3.7%	2.6%	3.2%	3.3%	3.6%

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
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 following table 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.	Average
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 $21.7 million which comprises a loss on liabilities of $24.9 million (1.6% of liabilities) and a gain on assets of $3.2 million (0.8% of assets). The following were the primary causes of the gains and/or losses:

- Demographic changes and changes in actuarial valuation software contributed to the gains and losses in liabilities
- The weighted average return on assets was 6.0% compared to the weighted average (by BOY asset value) discount rate of 5.2% resulting in a slight gain on assets

In addition to the loss, the plans experienced a net decrease of $12.8 million (0.8% of liabilities) due to changes in the discount rate. Twelve plans had an increase in their discount rates resulting in decreases to the liabilities and four plans had a decrease in their discount rates resulting in increases to the liabilities.

Commentary on Actuarial Health of Plans

The total funded status of all plans combined is 26%. The funded status for each individual plan ranges from 6% (Dunbar Fire) to 121% (Oak Hill Police). Plans that use the Conservation policy have the lowest funded ratio at an average ratio of 12%. The second lowest funded ratios are plans that use the Alternative funding policy with an average funded ratio of 26%. 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 33%. The dollar-weighted average funded ratio for plans that use the Optional from Standard policy or currently use the Standard policy is 80% and 68%, respectively. In addition, these plans are expected to experience a decrease in the 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.

<u>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.</u> 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 fund 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	1
Pays off UAL in 50 to 59 years	0
Pays off UAL in less than 50 years	0

Projected Funded Status

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

	Percentage of Plans Projected to be 100% Funded by 2031*				
Years	Standard	Optional from Standard	Optional from Alternative	Alternative	Conservation
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 2020 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***.

The following plans made changes to their funding policy this year.

Plan	Old Funding Policy	New Funding Policy
Chester Police	Standard	Optional
Dunbar Fire	Alternative	Conservation
Weirton Police	Alternative	Optional

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 5, 2019 with the results of this analysis. The following table summarizes the results:

Plan	Cost/(Savings)
St. Albans Fire	$102,264
St. Albans Police	$18,062
Wheeling Fire	($823,996)

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, 2018. Since July 1, 2018, 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.

Changes in Methods, Assumptions, and Plan Amendments

This valuation reflects the following changes in assumptions and methods:

- The premium tax allocation projection methodology was changed to reallocate the premium tax allocation in future years for plans that are projected to be 100% funded in the projection period.
- Sixteen plans had a change in the actual discount rate used, but the method for determining the discount rate stayed the same.

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

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	43	59	1	103	Alternative	O		4.50%	7.27%	18,449,645	30,495,352	38%
Beckley Police	52	51	2	105	Alternative	O		5.50%	6.71%	22,217,794	16,208,580	58%
Belle Police	0	5	1	6	Optional		C	7.00%	9.06%	1,507,352	144,188	91%
Bluefield Fire	16	40	2	58	Alternative	O		5.00%	7.54%	4,404,012	13,837,150	24%
Bluefield Police	27	27	3	57	Alternative	O		6.00%	7.19%	6,117,195	6,751,386	48%
Charles Town Police	0	4	0	4	Standard		C	5.00%	4.84%	490,865	809,337	38%
Charleston Fire	109	241	3	353	Conservation		C	4.50%	7.75%	20,062,367	169,943,071	11%
Charleston Police	102	215	9	326	Conservation		C	4.50%	7.53%	22,407,738	159,447,619	12%
Chester Police	3	5	0	8	Optional		C	6.50%	3.96%	1,677,406	577,736	74%
Clarksburg Fire	42	51	0	93	Alternative	O		5.00%	7.55%	8,484,043	25,695,297	25%
Clarksburg Police	44	49	3	96	Alternative	O		5.00%	6.39%	8,282,821	21,854,843	27%
Dunbar Fire	15	23	0	38	Conservation		C	4.50%	4.43%	818,621	13,255,979	6%
Dunbar Police	8	13	0	21	Optional		C	6.00%	5.06%	6,053,845	2,259,210	73%
Elkins Fire	3	2	0	5	Optional		C	6.00%	6.77%	1,658,526	(180,988)	112%
Elkins Police	5	11	0	16	Optional		C	6.50%	8.26%	3,521,226	1,431,703	71%
Fairmont Fire	38	52	0	90	Conservation		C	4.00%	6.09%	3,126,658	42,438,857	7%
Fairmont Police	27	49	4	80	Conservation		C	5.00%	7.65%	6,662,185	22,529,729	23%
Grafton Fire	1	6	0	7	Optional		C	6.00%	5.54%	1,696,760	1,080,002	61%
Grafton Police	2	6	0	8	Optional		C	6.00%	2.27%	1,571,613	493,722	76%
Huntington Fire	66	174	3	243	Optional		C	5.00%	5.64%	26,976,494	87,577,813	24%
Huntington Police	59	135	3	197	Optional		C	5.50%	6.42%	37,283,688	65,566,557	36%
Logan Fire	8	2	0	10	Standard	O		6.00%	3.64%	829,246	936,007	47%
Logan Police	7	2	0	9	Standard	O		6.00%	5.27%	834,749	1,124,771	43%
Martinsburg Fire	36	35	0	71	Alternative	O		4.50%	8.46%	2,975,500	32,230,575	8%
Martinsburg Police	44	39	0	83	Alternative	O		4.50%	3.76%	8,597,507	31,238,701	22%
Morgantown Fire	60	55	1	116	Alternative	O		4.50%	2.86%	12,718,148	36,480,451	26%
Morgantown Police	68	66	0	134	Alternative	O		4.50%	3.07%	15,731,259	50,508,526	24%
Moundsville Fire	2	14	1	17	Optional		C	5.00%	8.45%	1,466,645	2,551,109	37%
Moundsville Police	7	17	0	24	Optional		C	6.50%	5.05%	5,662,695	2,222,788	72%
Nitro Fire	16	11	0	27	Alternative	O		4.50%	4.66%	1,701,096	8,470,708	17%
Nitro Police	20	13	1	34	Alternative	O		5.00%	7.61%	4,135,800	7,298,337	36%
Oak Hill Police	5	6	1	12	Optional		C	6.50%	5.22%	4,407,224	(770,699)	121%
Parkersburg Fire	52	99	0	151	Optional		C	5.00%	3.57%	16,820,783	46,449,477	27%
Parkersburg Police	67	79	1	147	Optional		C	5.00%	2.44%	13,675,772	42,550,845	24%
Point Pleasant Police	4	7	0	11	Optional		C	5.00%	4.49%	1,117,892	3,439,935	25%
Princeton Fire	13	15	3	31	Alternative	O		4.50%	3.65%	2,948,777	8,491,051	26%
Princeton Police	20	21	2	43	Alternative	O		5.00%	3.01%	4,367,431	8,048,889	35%
South Charleston Fire	43	42	1	86	Alternative	O		4.50%	6.49%	2,708,786	32,991,026	8%
South Charleston Police	44	35	2	81	Alternative	O		4.50%	5.36%	3,083,043	24,783,314	11%
St. Albans Fire	20	27	4	51	Alternative	O		4.00%	3.08%	2,647,869	18,288,179	13%
St. Albans Police	25	21	6	52	Alternative	O		5.50%	2.76%	7,014,938	9,232,673	43%
Star City Police	6	5	0	11	Optional		C	6.50%	7.35%	1,649,870	102,852	94%
Vienna Police	17	14	3	34	Standard	O		6.50%	9.16%	8,503,416	2,112,002	80%
Weirton Fire	22	21	0	43	Optional		C	6.50%	7.65%	10,970,366	4,184,357	72%
Weirton Police	35	50	1	86	Optional		C	4.50%	7.69%	5,423,826	32,549,032	14%
Welch Police	4	4	0	8	Optional		C	6.50%	8.27%	2,789,094	(307,251)	112%
Weston Fire	5	3	1	9	Optional		C	6.50%	10.47%	1,224,278	540,202	69%
Weston Police	3	4	0	7	Optional		C	6.50%	9.88%	1,461,295	(7,011)	100%
Westover Police	2	4	1	7	Optional		C	6.50%	2.60%	2,511,568	262,338	91%
Wheeling Fire	61	127	5	193	Optional		C	5.50%	7.23%	28,267,209	45,399,981	38%
Wheeling Police	44	107	3	154	Optional		C	6.00%	7.47%	24,663,385	27,741,683	47%
Williamson Fire	5	12	1	18	Optional		C	5.50%	(0.80%)	1,648,926	2,836,406	37%
Williamson Police	3	8	0	11	Optional		C	6.00%	(11.70%)	1,218,089	1,328,893	48%
Totals	**1,430**	**2,183**	**72**	**3,685**				**4.90%**[1]	**6.03%**[2]	**407,247,335**	**1,165,527,291**	**26%**

[1] Weighted average by liabilities on the valuation date. The discount rate weighted by BOY asset values is 5.25%.

[2] Weighted average by assets 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, 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, 2018 valuation for each of the 53 pension plans.

Municipality	Plan	Discount Rate
Beckley	Fire	4.50%
Beckley	Police	5.50%
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	6.50%
Clarksburg	Fire	5.00%
Clarksburg	Police	5.00%
Dunbar	Fire	4.50%
Dunbar	Police	6.00%
Elkins	Fire	6.50%
Elkins	Police	6.00%
Fairmont	Fire	4.00%
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	5.00%
Parkersburg	Police	5.00%
Point Pleasant	Police	5.00%
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	4.50%
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	6.00%
Average[3]		**4.90%**

[3] Weighted average by liabilities on the valuation date.

Changes in Discount Rate

The following table lists the plans that had a change in their discount rate from 2017 to 2018.

Plan Name	2017 Discount Rate	2018 Discount Rate
Beckley Police	6.0%	5.5%
Elkins Fire	6.5%	6.0%
Elkins Police	6.0%	6.5%
Grafton Police	5.5%	6.0%
Logan Police	5.5%	6.0%
Martinsburg Fire	4.0%	4.5%
Princeton Fire	4.0%	4.5%
Princeton Police	5.5%	5.0%
South Charleston Fire	4.0%	4.5%
South Charleston Police	4.0%	4.5%
Weirton Police	4.0%	4.5%
Weston Fire	6.0%	6.5%
Weston Police	6.0%	6.5%
Wheeling Police	5.5%	6.0%
Williamson Fire	6.0%	5.5%
Williamson Police	5.0%	6.0%

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, 2018.

	Standard	Opt. from Stan.	Opt. from Alt.	Alternative	Conservation	All Plans
Participating Plans	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	3	2	8	20	7	40
(g) Total	57	95	1,325	1,321	887	3,685
Payroll (Expected for 2019)	1,497,429	1,541,740	24,481,132	34,183,694	17,401,245	79,105,240
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	94,478,285
(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	41,625	35,533	195,591	126,978	219,215	618,942
(g) Total Liabilities	15,640,393	30,083,631	546,867,076	519,490,702	460,692,824	1,572,774,626
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%
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						
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	-	-	-	-	-	-

Below is a summary of the key valuation results by funding policy as of July 1, 2017.

	Standard	Opt. from Stan.	Opt. from Alt.	Alternative	Conservation	All Plans
Participating Plans	5	10	14	20	4	53
Plan Membership						
(a) Actives	38	33	441	662	302	1,476
(b) Retirees	26	54	796	714	551	2,141
(c) Survivors	0	1	13	12		33
(d) Disableds	0	0	0	0	0	0
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	0	0	0	0	0	0
(g) Total	64	88	1,250	1,388	860	3,650
Payroll (Expected for 2018)	1,727,328	1,497,402	22,172,387	34,132,548	17,129,740	76,659,405
Expected Benefit Payments	779,504	1,368,964	24,414,911	21,875,660	17,694,484	66,133,523
Actuarial Accrued Liabilities						
(a) Actives	7,196,090	8,049,516	145,984,631	198,276,269	137,516,615	497,023,121
(b) Retirees	10,048,892	19,313,891	339,355,639	342,894,670	284,900,085	996,513,177
(c) Survivors	0	359,112	8,283,531	7,328,672	5,293,188	21,264,503
(d) Disableds	0	0	0	0	0	0
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	0	0	0	0	0	0
(g) Total Liabilities	17,244,982	27,722,519	493,623,801	548,499,611	427,709,888	1,514,800,801
Market Value of Assets	11,206,235	20,739,904	158,868,825	133,565,255	45,537,389	369,917,608
Unfunded Liability	6,038,747	6,982,615	334,754,976	414,934,356	382,172,499	1,144,883,193
Funded Ratio	65%	75%	32%	24%	11%	24%
Net Employer Normal Cost	457,190	459,139	7,903,292	14,559,389	7,866,855	31,245,865
(% of Payroll)	26%	31%	36%	43%	46%	41%
FYE 2019 Contributions						
Employer Contributions	735,422	890,884	23,098,522	11,010,866	14,389,602	50,125,296
(% of Payroll)	41%	60%	106%	31%	85%	65%
State Premium Tax Allocation	352,040	722,081	6,170,354	6,919,355	4,353,363	18,517,193
(% of Payroll)	20%	49%	28%	20%	26%	24%
Employee Contributions	145,030	113,794	1,609,718	3,006,250	1,367,911	6,242,703
(% of Payroll)	8.1%	7.7%	7.4%	8.5%	8.1%	8.1%
Total Contributions	1,232,492	1,726,759	30,878,594	20,936,471	20,110,876	74,885,192
Additional 2019 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	10,349	-	10,349

Key Valuation Results by Municipality

Below is a summary of the key valuation results for each individual municipality as of July 1, 2018.

	Beckley Fire	Beckley Police	Belle Police	Bluefield Fire	Bluefield Police	Charles Town Police
Discount Rate	4.50%	5.50%	7.00%	5.00%	6.00%	5.00%
Plan Membership						
(a) Actives	43	52	0	16	27	0
(b) Retirees	36	30	4	24	15	2
(c) Survivors	16	11	1	9	9	2
(d) Disableds	7	10	0	7	3	0
(e) Deferred Vesteds	1	1	0	1	1	0
(f) Former Members Due Refunds	0	1	1	1	2	0
(g) Total	103	105	6	58	57	4
Payroll (Expected for 2019)	2,289,203	2,671,312	0	688,341	1,135,170	0
Expected Benefit Payments	2,145,187	1,701,564	176,355	872,317	635,661	93,343
Actuarial Accrued Liabilities						
(a) Actives	16,797,934	12,368,648	0	2,862,348	3,162,388	0
(b) Retirees	25,255,495	19,513,882	1,420,045	10,656,096	7,145,143	736,492
(c) Survivors	2,973,473	2,013,979	196,947	1,345,981	1,176,690	563,710
(d) Disableds	3,238,181	4,003,077	0	2,797,665	921,583	0
(e) Deferred Vesteds	679,914	508,555	0	568,573	456,064	0
(f) Former Members Due Refunds	0	18,233	34,548	10,499	6,713	0
(g) Total Liabilities	48,944,997	38,426,374	1,651,540	18,241,162	12,868,581	1,300,202
Market Value of Assets	18,449,645	22,217,794	1,507,352	4,404,012	6,117,195	490,865
Unfunded Liability	30,495,352	16,208,580	144,188	13,837,150	6,751,386	809,337
Funded Ratio	38%	58%	91%	24%	48%	38%
Net Employer Normal Cost	1,051,101	858,070	186	243,775	284,735	1,134
(% of Payroll)	46%	32%	N/A	35%	25%	N/A
FYE 2020 Contributions						
Employer Contributions	771,118	588,516	186	476,378	386,465	73,756
(% of Payroll)	34%	22%	N/A	69%	34%	N/A
State Premium Tax Allocation	500,554	561,153	44,483	240,729	300,553	11,460
(% of Payroll)	22%	21%	N/A	35%	26%	N/A
Employee Contributions	179,933	214,730	0	58,240	98,479	0
(% of Payroll)	7.9%	8.0%	N/A	8%	9%	N/A
Total Contributions	1,451,605	1,364,399	44,669	775,347	785,497	85,216
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	Charleston Fire	Charleston Police	Chester Police	Clarksburg Fire	Clarksburg Police	Dunbar Fire
Discount Rate	4.50%	4.50%	6.50%	5.00%	5.00%	4.50%
Plan Membership						
(a) Actives	109	102	3	42	44	15
(b) Retirees	148	132	3	30	24	17
(c) Survivors	52	48	2	16	14	3
(d) Disableds	41	35	0	5	11	3
(e) Deferred Vesteds	2	7	0	0	2	0
(f) Former Members Due Refunds	1	2	0	0	1	0
(g) Total	353	326	8	93	96	38
Payroll (Expected for 2019)	6,419,737	6,815,851	137,219	1,963,141	2,250,404	725,037
Expected Benefit Payments	7,755,741	7,194,296	138,355	1,361,449	1,283,863	624,355
Actuarial Accrued Liabilities						
(a) Actives	56,280,855	54,069,447	108,703	15,851,817	9,279,617	2,923,023
(b) Retirees	97,960,178	87,795,262	1,694,142	14,008,142	13,776,056	9,406,815
(c) Survivors	10,509,505	11,638,124	452,297	2,447,641	2,473,047	310,238
(d) Disableds	23,685,800	21,774,096	0	1,871,740	3,215,655	1,434,524
(e) Deferred Vesteds	1,497,248	6,487,888	0	0	1,392,801	0
(f) Former Members Due Refunds	71,852	90,540	0	0	488	0
(g) Total Liabilities	190,005,438	181,855,357	2,255,142	34,179,340	30,137,664	14,074,600
Market Value of Assets	20,062,367	22,407,738	1,677,406	8,484,043	8,282,821	818,621
Unfunded Liability	169,943,071	159,447,619	577,736	25,695,297	21,854,843	13,255,979
Funded Ratio	11%	12%	74%	25%	27%	6%
Net Employer Normal Cost	2,824,678	2,934,916	24,796	743,672	775,477	287,074
(% of Payroll)	44%	43%	18%	38%	34%	40%
FYE 2020 Contributions						
Employer Contributions	6,609,273	5,961,492	53,285	1,162,875	1,151,896	478,400
(% of Payroll)	103%	87%	39%	59%	51%	66%
State Premium Tax Allocation	1,952,515	1,914,536	36,609	478,835	457,642	181,634
(% of Payroll)	30%	28%	27%	24%	20%	25%
Employee Contributions	505,115	553,514	13,045	149,322	188,711	64,106
(% of Payroll)	8%	8%	10%	8%	8%	9%
Total Contributions	9,066,903	8,429,542	102,939	1,791,032	1,798,249	724,140
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	Dunbar Police	Elkins Fire	Elkins Police	Fairmont Fire	Fairmont Police	Grafton Fire
Discount Rate	6.00%	6.00%	6.50%	4.00%	5.00%	6.00%
Plan Membership						
(a) Actives	8	3	5	38	27	1
(b) Retirees	8	1	9	39	30	5
(c) Survivors	1	1	2	12	14	0
(d) Disableds	4	0	0	1	5	1
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	0	0	0	0	4	0
(g) Total	21	5	16	90	80	7
Payroll (Expected for 2019)	437,624	145,017	230,738	1,958,395	1,482,225	44,446
Expected Benefit Payments	384,641	46,572	349,143	1,641,909	1,442,599	144,046
Actuarial Accrued Liabilities						
(a) Actives	2,296,119	1,086,186	379,126	19,967,717	6,995,597	360,121
(b) Retirees	4,062,339	381,209	4,145,335	23,767,012	17,963,892	2,127,559
(c) Survivors	124,118	10,143	428,468	1,594,514	2,534,970	0
(d) Disableds	1,830,479	0	0	236,272	1,640,632	289,082
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	0	0	0	0	56,823	0
(g) Total Liabilities	8,313,055	1,477,538	4,952,929	45,565,515	29,191,914	2,776,762
Market Value of Assets	6,053,845	1,658,526	3,521,226	3,126,658	6,662,185	1,696,760
Unfunded Liability	2,259,210	(180,988)	1,431,703	42,438,857	22,529,729	1,080,002
Funded Ratio	73%	112%	71%	7%	23%	61%
Net Employer Normal Cost	132,733	45,969	49,161	1,012,894	502,493	11,119
(% of Payroll)	30%	32%	21%	52%	34%	25%
FYE 2020 Contributions						
Employer Contributions	148,650	45,969	91,013	1,257,826	914,368	88,801
(% of Payroll)	34%	32%	39%	64%	62%	200%
State Premium Tax Allocation	140,735	0	119,469	467,789	420,498	40,812
(% of Payroll)	32%	0%	52%	24%	28%	92%
Employee Contributions	31,995	10,166	20,727	164,040	120,752	3,112
(% of Payroll)	7%	7%	9%	8%	8%	7%
Total Contributions	321,380	56,135	231,209	1,889,655	1,455,618	132,725
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	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	66	59	8	7	36
(b) Retirees	1	116	94	1	2	23
(c) Survivors	3	40	27	1	0	4
(d) Disableds	2	18	14	0	0	8
(e) Deferred Vesteds	0	3	3	0	0	0
(f) Former Members Due Refunds	0	0	0	0	0	0
(g) Total	8	243	197	10	9	71
Payroll (Expected for 2019)	116,270	3,488,570	4,046,524	317,429	277,925	2,137,952
Expected Benefit Payments	83,713	5,733,538	4,814,346	29,797	46,735	1,367,719
Actuarial Accrued Liabilities						
(a) Actives	890,171	27,295,498	32,578,311	1,458,587	1,213,778	13,109,646
(b) Retirees	250,514	70,431,688	56,830,521	160,591	745,742	18,323,822
(c) Survivors	306,143	7,588,184	5,774,349	146,075	0	1,183,813
(d) Disableds	618,507	7,603,411	5,354,679	0	0	2,588,794
(e) Deferred Vesteds	0	1,635,526	2,312,385	0	0	0
(f) Former Members Due Refunds	0	0	0	0	0	0
(g) Total Liabilities	2,065,335	114,554,307	102,850,245	1,765,253	1,959,520	35,206,075
Market Value of Assets	1,571,613	26,976,494	37,283,688	829,246	834,749	2,975,500
Unfunded Liability	493,722	87,577,813	65,566,557	936,007	1,124,771	32,230,575
Funded Ratio	76%	24%	36%	47%	43%	8%
Net Employer Normal Cost	32,884	1,356,864	1,296,496	91,914	80,115	893,664
(% of Payroll)	28%	39%	32%	29%	29%	42%
FYE 2020 Contributions						
Employer Contributions	32,884	5,621,140	4,513,869	126,895	143,359	813,393
(% of Payroll)	28%	161%	112%	40%	52%	38%
State Premium Tax Allocation	69,711	1,179,833	1,091,330	67,715	60,163	377,658
(% of Payroll)	60%	34%	27%	21%	22%	18%
Employee Contributions	8,141	244,272	283,407	24,274	22,389	178,606
(% of Payroll)	7%	7%	7%	8%	8%	8%
Total Contributions	110,736	7,045,245	5,888,606	218,884	225,911	1,369,657
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	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	44	60	68	2	7	16
(b) Retirees	23	37	45	7	10	8
(c) Survivors	8	16	13	5	7	1
(d) Disableds	8	2	8	2	0	2
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	0	1	0	1	0	0
(g) Total	83	116	134	17	24	27
Payroll (Expected for 2019)	2,798,681	3,636,132	4,424,855	96,810	373,744	803,028
Expected Benefit Payments	1,350,914	1,738,887	2,424,655	306,659	397,162	344,326
Actuarial Accrued Liabilities						
(a) Actives	16,653,460	22,795,456	26,070,945	454,788	2,189,678	3,817,807
(b) Retirees	18,769,048	22,937,864	33,706,184	2,092,371	4,794,107	4,646,265
(c) Survivors	1,293,317	2,654,461	2,728,164	955,097	901,698	166,899
(d) Disableds	3,120,383	800,062	3,734,492	504,677	0	1,540,833
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	0	10,756	0	10,821	0	0
(g) Total Liabilities	39,836,208	49,198,599	66,239,785	4,017,754	7,885,483	10,171,804
Market Value of Assets	8,597,507	12,718,148	15,731,259	1,466,645	5,662,695	1,701,096
Unfunded Liability	31,238,701	36,480,451	50,508,526	2,551,109	2,222,788	8,470,708
Funded Ratio	22%	26%	24%	37%	72%	17%
Net Employer Normal Cost	1,193,383	1,575,005	1,745,106	41,302	94,251	326,878
(% of Payroll)	43%	43%	39%	43%	25%	41%
FYE 2020 Contributions						
Employer Contributions	670,588	944,226	1,235,334	123,005	94,251	189,695
(% of Payroll)	24%	26%	28%	127%	25%	24%
State Premium Tax Allocation	474,576	631,772	738,271	76,882	170,754	146,369
(% of Payroll)	17%	17%	17%	79%	46%	18%
Employee Contributions	236,126	294,724	420,506	6,777	26,169	67,215
(% of Payroll)	8%	8%	10%	7%	7%	8%
Total Contributions	1,381,290	1,870,722	2,394,111	206,664	291,174	403,279
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	Nitro Police	Oak Hill Police	Parkersburg Fire	Parkersburg Police	Point Pleasant Police	Princeton Fire
Discount Rate	5.00%	6.50%	5.00%	5.00%	5.00%	4.50%
Plan Membership						
(a) Actives	20	5	52	67	4	13
(b) Retirees	6	5	65	49	4	10
(c) Survivors	4	1	23	19	2	3
(d) Disableds	3	0	11	11	1	2
(e) Deferred Vesteds	1	0	0	0	0	3
(f) Former Members Due Refunds	0	1	0	1	0	0
(g) Total	34	12	151	147	11	31
Payroll (Expected for 2019)	1,096,302	251,778	2,621,372	3,321,602	170,473	617,676
Expected Benefit Payments	304,570	172,930	2,892,067	2,360,880	148,657	371,694
Actuarial Accrued Liabilities						
(a) Actives	4,961,298	1,132,155	19,159,466	18,680,452	1,856,983	4,009,269
(b) Retirees	3,276,338	2,327,291	36,080,602	28,268,984	1,842,312	4,194,153
(c) Survivors	961,668	176,094	3,332,152	3,389,674	253,280	491,941
(d) Disableds	1,465,618	0	4,698,040	5,874,871	605,252	1,156,532
(e) Deferred Vesteds	769,215	0	0	0	0	1,587,933
(f) Former Members Due Refunds	0	985	0	12,636	0	0
(g) Total Liabilities	11,434,137	3,636,525	63,270,260	56,226,617	4,557,827	11,439,828
Market Value of Assets	4,135,800	4,407,224	16,820,783	13,675,772	1,117,892	2,948,777
Unfunded Liability	7,298,337	(770,699)	46,449,477	42,550,845	3,439,935	8,491,051
Funded Ratio	36%	121%	27%	24%	25%	26%
Net Employer Normal Cost	403,789	59,139	1,056,746	1,219,235	76,337	260,921
(% of Payroll)	37%	23%	40%	37%	45%	42%
FYE 2020 Contributions						
Employer Contributions	203,594	59,139	3,227,925	3,112,083	358,206	123,291
(% of Payroll)	19%	23%	123%	94%	210%	20%
State Premium Tax Allocation	175,848	0	716,265	752,245	75,507	145,654
(% of Payroll)	16%	0%	27%	23%	44%	24%
Employee Contributions	95,087	20,087	197,907	263,558	11,940	48,620
(% of Payroll)	9%	8%	8%	8%	7%	8%
Total Contributions	474,529	79,226	4,142,097	4,127,886	445,653	317,565
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	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	20	43	44	20	25	6
(b) Retirees	15	25	15	13	16	1
(c) Survivors	2	12	8	9	4	4
(d) Disableds	4	5	12	5	1	0
(e) Deferred Vesteds	0	1	0	0	0	0
(f) Former Members Due Refunds	2	0	2	4	6	0
(g) Total	43	86	81	51	52	11
Payroll (Expected for 2019)	1,034,188	2,324,322	2,098,591	954,643	1,259,753	246,817
Expected Benefit Payments	601,652	1,245,131	1,021,532	1,084,037	731,310	81,323
Actuarial Accrued Liabilities						
(a) Actives	3,068,554	14,121,278	11,220,130	7,369,641	4,771,273	520,739
(b) Retirees	7,470,741	16,325,922	9,064,594	9,356,387	10,005,696	393,397
(c) Survivors	332,367	2,395,898	1,915,494	1,720,279	863,573	838,586
(d) Disableds	1,502,660	1,939,253	5,652,035	2,482,880	589,743	0
(e) Deferred Vesteds	0	917,461	0	0	0	0
(f) Former Members Due Refunds	41,998	0	14,104	6,861	17,326	0
(g) Total Liabilities	12,416,320	35,699,812	27,866,357	20,936,048	16,247,611	1,752,722
Market Value of Assets	4,367,431	2,708,786	3,083,043	2,647,869	7,014,938	1,649,870
Unfunded Liability	8,048,889	32,991,026	24,783,314	18,288,179	9,232,673	102,852
Funded Ratio	35%	8%	11%	13%	43%	94%
Net Employer Normal Cost	353,610	1,000,453	876,075	477,524	388,673	58,497
(% of Payroll)	34%	43%	42%	50%	31%	24%
FYE 2020 Contributions						
Employer Contributions	243,382	844,820	469,979	294,688	347,129	58,497
(% of Payroll)	24%	36%	22%	31%	28%	24%
State Premium Tax Allocation	224,450	470,681	447,012	247,721	269,689	66,137
(% of Payroll)	22%	20%	21%	26%	21%	27%
Employee Contributions	90,216	184,605	168,973	90,739	119,725	21,733
(% of Payroll)	9%	8%	8%	10%	10%	9%
Total Contributions	558,048	1,500,106	1,085,964	633,148	736,543	146,367
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	Vienna Police	Weirton Fire	Weirton Police	Welch Police	Weston Fire	Weston Police
Discount Rate	6.50%	6.50%	4.50%	6.50%	6.50%	6.50%
Plan Membership						
(a) Actives	17	22	35	4	5	3
(b) Retirees	7	16	37	4	3	3
(c) Survivors	2	5	10	0	0	1
(d) Disableds	5	0	3	0	0	0
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	3	0	1	0	1	0
(g) Total	34	43	86	8	9	7
Payroll (Expected for 2019)	902,075	1,264,119	2,133,389	208,669	174,234	133,184
Expected Benefit Payments	512,606	722,723	1,630,234	106,103	79,141	72,957
Actuarial Accrued Liabilities						
(a) Actives	4,273,378	6,470,206	13,105,801	825,672	653,050	423,499
(b) Retirees	3,811,859	7,775,931	21,855,199	1,656,171	1,105,139	961,332
(c) Survivors	471,264	908,586	1,765,005	0	0	69,453
(d) Disableds	2,017,292	0	1,200,368	0	0	0
(e) Deferred Vesteds	0	0	0	0	0	0
(f) Former Members Due Refunds	41,625	0	46,485	0	6,291	0
(g) Total Liabilities	10,615,418	15,154,723	37,972,858	2,481,843	1,764,480	1,454,284
Market Value of Assets	8,503,416	10,970,366	5,423,826	2,789,094	1,224,278	1,461,295
Unfunded Liability	2,112,002	4,184,357	32,549,032	(307,251)	540,202	(7,011)
Funded Ratio	80%	72%	14%	112%	69%	100%
Net Employer Normal Cost	218,817	344,934	887,297	52,363	49,303	26,811
(% of Payroll)	24%	27%	42%	25%	28%	20%
FYE 2020 Contributions						
Employer Contributions	266,445	408,221	2,388,841	52,363	49,303	26,811
(% of Payroll)	30%	32%	112%	25%	28%	20%
State Premium Tax Allocation	190,349	242,302	408,735	0	47,966	0
(% of Payroll)	21%	19%	19%	0%	28%	0%
Employee Contributions	69,385	98,714	195,708	15,489	14,787	11,087
(% of Payroll)	8%	8%	9%	7%	8%	8%
Total Contributions	526,179	749,237	2,993,284	67,852	112,056	37,898
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

	Westover Police	Wheeling Fire	Wheeling Police	Williamson Fire	Williamson Police	Grand Total
Discount Rate	6.50%	5.50%	6.00%	5.50%	6.00%	N/A
Plan Membership						
(a) Actives	2	61	44	5	3	1,430
(b) Retirees	4	88	70	6	3	1,389
(c) Survivors	0	33	30	4	4	518
(d) Disableds	0	6	7	2	1	276
(e) Deferred Vesteds	1	4	1	0	0	32
(f) Former Members Due Refunds	0	1	2	1	0	40
(g) Total	7	193	154	18	11	3,685
Payroll (Expected for 2019)	103,946	3,739,386	2,293,575	144,687	98,679	79,105,240
Expected Benefit Payments	115,977	4,226,729	3,018,178	228,599	130,202	68,489,079
Actuarial Accrued Liabilities						
(a) Actives	619,347	21,295,232	12,441,412	604,016	483,329	505,383,951
(b) Retirees	1,770,379	43,309,516	32,905,692	2,323,248	1,222,682	822,807,376
(c) Survivors	0	5,258,104	3,952,058	781,747	609,017	94,978,285
(d) Disableds	0	1,814,162	2,579,046	770,143	231,954	127,384,473
(e) Deferred Vesteds	384,180	1,969,059	434,797	0	0	21,601,599
(f) Former Members Due Refunds	0	21,117	92,063	6,178	0	618,942
(g) Total Liabilities	2,773,906	73,667,190	52,405,068	4,485,332	2,546,982	1,572,774,626
Market Value of Assets	2,511,568	28,267,209	24,663,385	1,648,926	1,218,089	407,247,335
Unfunded Liability	262,338	45,399,981	27,741,683	2,836,406	1,328,893	1,165,527,291
Funded Ratio	91%	38%	47%	37%	48%	26%
Net Employer Normal Cost	36,038	1,280,685	617,497	49,248	28,172	30,336,178
(% of Payroll)	35%	34%	27%	35%	29%	38%
FYE 2020 Contributions						
Employer Contributions	36,038	3,208,450	1,701,999	159,291	57,521	52,466,835
(% of Payroll)	35%	86%	74%	110%	58%	66%
State Premium Tax Allocation	95,351	1,055,693	839,091	77,688	63,629	19,567,053
(% of Payroll)	92%	28%	37%	54%	64%	25%
Employee Contributions	7,277	228,563	176,259	11,858	7,699	6,344,776
(% of Payroll)	7%	6%	8%	8%	8%	8%
Total Contributions	138,666	4,492,706	2,717,349	248,837	128,849	78,378,664
Additional 2020 Solvency Contribution						
− To Receive State Allocation	-	-	-	-	-	-
− To provide COLA Benefits	-	-	-	-	-	-

Experience (Gain)/Loss for Plan Year Ended June 30, 2018

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, 2018			
1. Liabilities			
a.	Actuarial Accrued Liability as of 7/1/2017	$	1,514,800,801
b.	Normal Cost as of 7/1/2017		37,119,133
c.	Interest on a. and b. to 6/30/2018		74,309,180
d.	Benefit Payments with Interest to 6/30/2018		65,538,508
e.	Effect of Assumption Changes		(12,799,224)
f.	Expected Liability at 7/1/2018 (a. + b. + c. – d. + e.)		1,547,891,382
g.	Actual Liability at 7/1/2018		1,572,774,626
h.	Liability (Gain)/Loss (g. - f.)		24,883,244
2. Market Value of Assets			
a.	Market Value of Assets as of 7/1/2017	$	369,522,668
b.	Interest on a. to 6/30/2018		19,279,817
c.	Contributions with Interest to 6/30/2018		81,005,744
d.	Benefit Payments with Interest to 6/30/2018		65,538,508
e.	Administrative Expenses with Interest to 6/30/2018		234,517
f.	Expected Assets at 6/30/2018 (a. + b. + c. – d. – e.)		404,035,204
g.	Actual Assets at 6/30/2018		407,247,335
h.	Asset (Gain)/Loss (f. - g.)		(3,212,131)
3. Total (Gain)/Loss (1h. + 2h.)		$	21,671,113

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, 2016 through June 30, 2018.

Plan Year Ending		June 30, 2017		June 30, 2018
1. Beginning of Year Market Value of Assets	$	329,405,552	$	369,708,493
Adjustments to Market Value of Assets at Beginning of Year		(366,517)		(185,825)
Beginning of Year Market Value of Assets	**$**	**329,039,035**	**$**	**369,522,668**
2. Additions				
a. Contributions				
(i) Local Government	$	44,247,074	$	51,961,063
(ii) State Government		16,283,644		17,281,292
(iii) Employee		6,420,086		6,393,178
(iv) Total		66,950,804		75,635,533
b. Receivable Contribution[4]				
(i) Local Government	$	5,730,840	$	2,819,573
(ii) State Government		1,275,855		670,238
(iii) Employee Contributions		62,908		22,429
(iv) Total		7,069,603		3,512,240
c. Earnings on Investments				
(i) Net Appreciation/(Depreciation)	$	19,574,138	$	10,049,013
(ii) Net Realized Gain (Loss) on Sale/Exchange		3,591,716		5,563,729
(iii) Interest and Dividends		7,250,059		8,140,839
(iv) Other Income		422,017		129,450
(v) Investment Expense		(1,195,392)		(1,578,148)
(vi) Receivable Investment Income		189,320		428,987
(vii) Payable Investment Expenses		0		0
(viii) Net Investment Income		29,831,858		22,733,870
d. Other Revenue		50,175		56,178
e. Total Additions	**$**	**103,902,440**	**$**	**101,937,821**
3. Disbursements				
a. Benefit Payments	$	61,155,407	$	62,196,524
b. Withdrawals		834,557		802,354
c. Administrative Expenses		391,173		206,912
d. Other		0		(122)
e. Payable Benefits and Withdrawals		623,450		985,659
f. Payable Administrative Expenses		19,280		21,827
g. Total Disbursements	**$**	**63,023,867**	**$**	**64,213,154**
4. Net Increase (2.e. – 3.g.)		40,878,573		37,724,667
5. Net Assets (1. + 4.)	**$**	**369,917,608**	**$**	**407,247,335**
6. Rate of Return Net of Investment Fees (2I / [A + B – I] Method[5])		8.9%		6.0%

[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, 2017 and June 30, 2018.

Assets Held by Category	June 30, 2017		June 30, 2018	
Cash and Deposits	$	30,752,184	$	25,144,878
Receivables				
Contributions	$	7,059,202	$	3,512,240
Investment Income		211,062		428,987
Total Receivable Contributions	**$**	**7,270,264**	**$**	**3,941,227**
Investment				
Government Securities	$	43,067,870	$	44,826,689
Corporate Bonds		85,730,426		98,235,117
Corporate Stocks		189,396,366		221,246,179
Alternative Investments		12,367,131		13,452,448
Other		1,968,740		1,408,283
Total Investments	**$**	**332,530,533**	**$**	**379,168,716**
Total Assets	**$**	**370,552,981**	**$**	**408,254,821**
Liabilities				
Payables	$	635,373	$	1,007,486
Total Liabilities	**$**	**635,373**	**$**	**1,007,486**
Net Position	**$**	**369,917,608**	**$**	**407,247,335**

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 from the second prior calendar year to the annual average 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, 2018 valuation, the 15-year period would end on June 30, 2033. 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 fest 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 this plan are the Optional and Conservation funding policies. The Optional funding policy is defined in West Virginia Code §8-22-20(e)(1), and is effective 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 effective 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

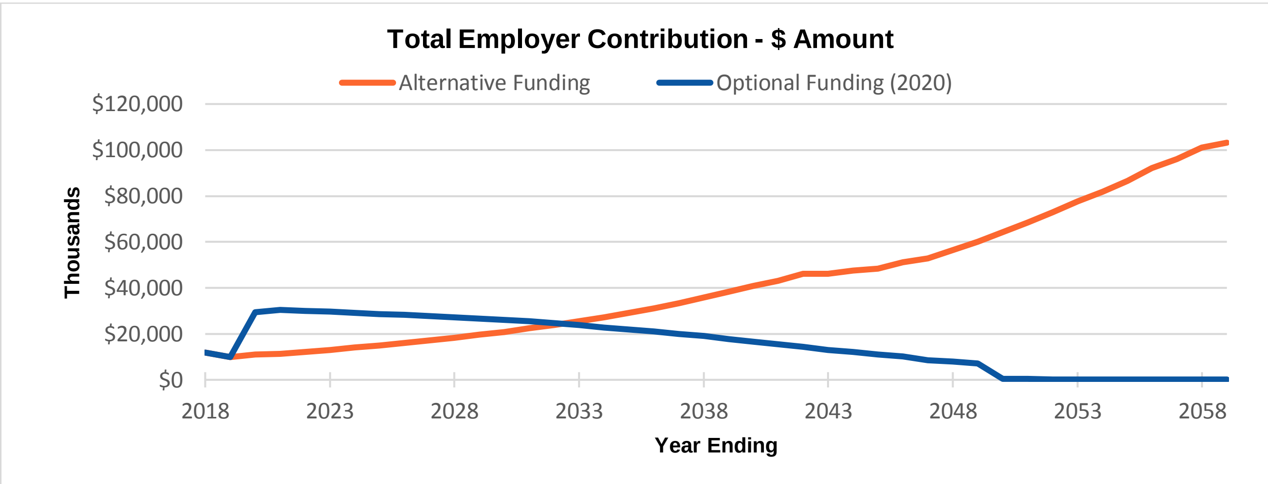
If the municipality were to choose to switch to the Optional funding policy in lieu of the Alternative funding policy (or switch to the Optional funding policy from the Standard funding policy), the following conditions would apply to the plan:

- 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 (31.5 years from July 1, 2018).
- 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

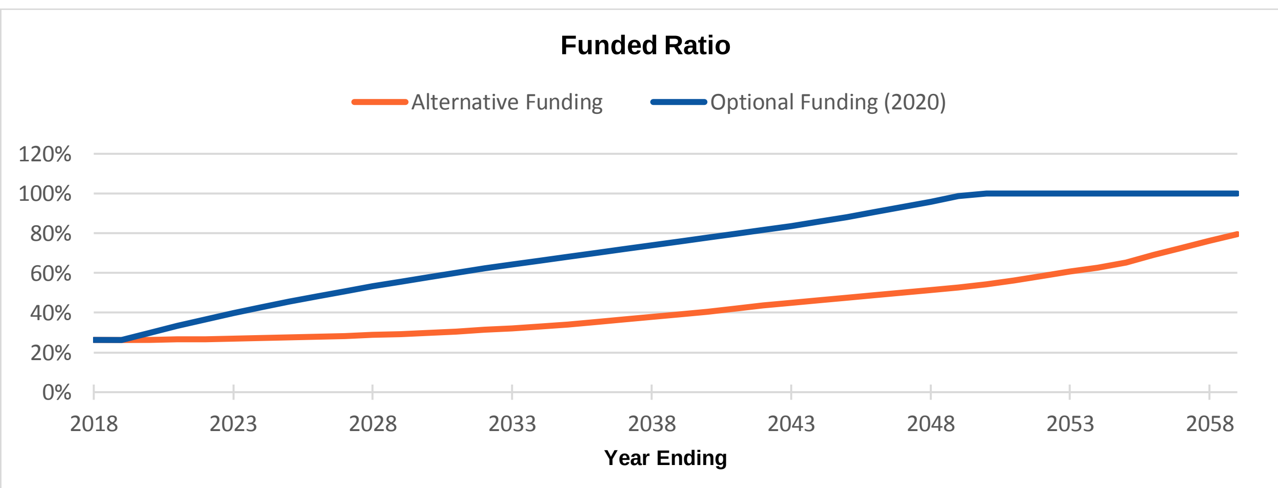
- The West Virginia Consolidated Public Retirement Board can change the employer contribution and employee contribution to a percentage of pay between 8.5% and 10.5% as needed to maintain an actuarially sound pension plan

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 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 2020 for the next 40 years.



The following graph shows the projected funded status 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 2020 for the next 40 years.



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 increase contributions, with a quicker timeframe to being 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. Getting money into 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.

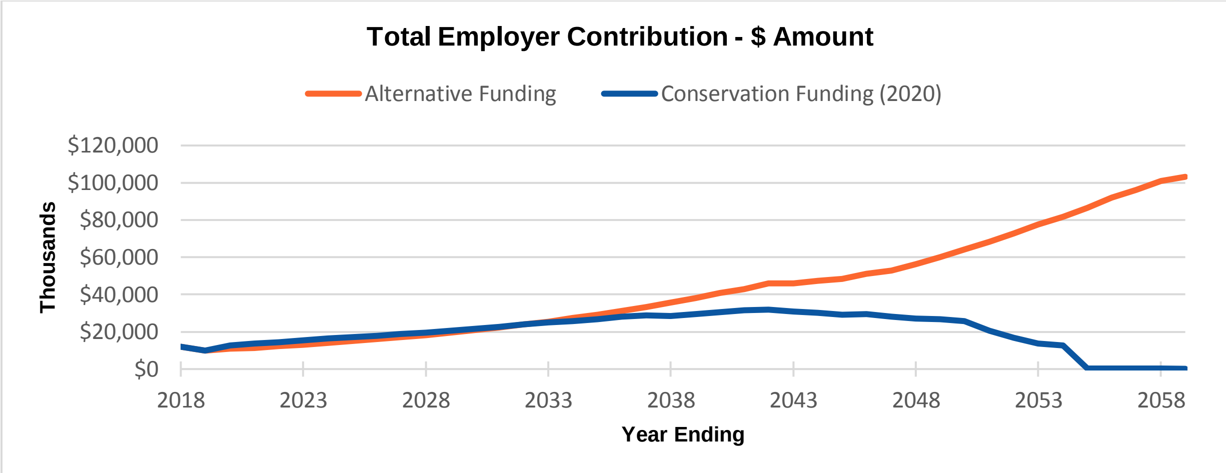
Conservation Funding Policy

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

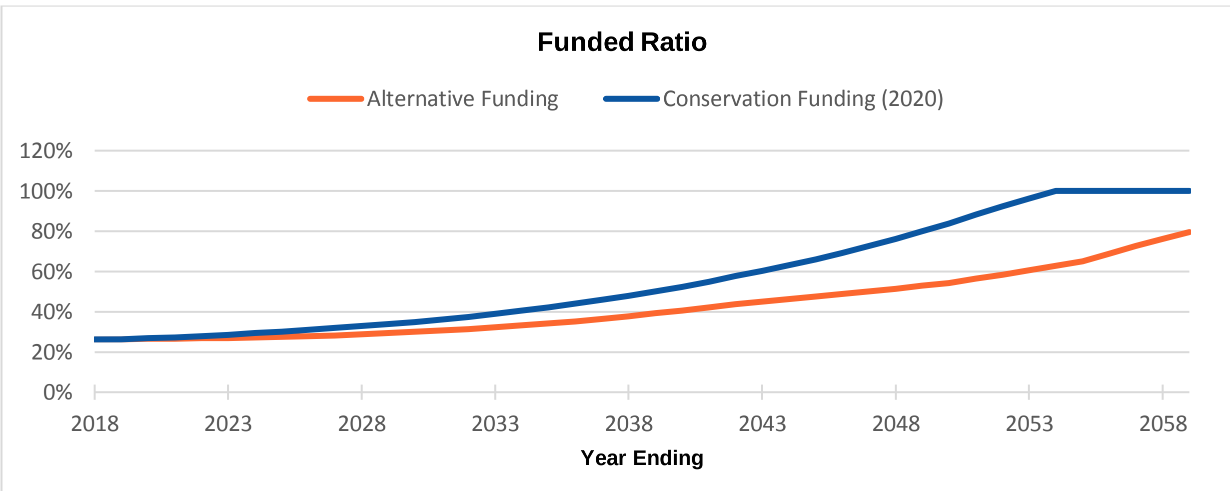
- The plan's assets would be segregated into two accounts, an accumulation account and a payment account; the accounts would be funded as follows:
    - Until the plan is 100% funded, 1.5% of employee contributions would be deposited into the accumulation account.
    - An actuarially determined portion 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 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 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 2020 for the next 40 years.



The following graph shows the projected funded status 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 2020 for the next 40 years.



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, St. Albans Fire, and St. Albans Police.

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 four categories of cost and/or savings. The four categories are Payment Trade-off, Drop Member Contributions, Premium Tax Allocation, and any additional Normal Cost contribution.

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

- **Payment Trade-off:** This is a trade-off between (a) locking into a lower benefit with a longer payment period versus getting a higher benefit with a shorter payment period (the options if no DROP is offered), or (b) taking the retirement benefit immediately versus entering the DROP immediately. Whether there is an increase or decrease in the liability due to the DROP depends on which category the member falls. For the members expected to retire at the DROP entry date, the DROP creates a gain because the DROP provisions do not grant interest credit on the DROP account and the plan saves on the investment return that would have been lost if those payments were no longer in the trust. For those not immediately eligible, the trade-off is whether a higher benefit paid later for a shorter period of time is more valuable than a lower benefit paid now for a longer period of time. For this case, it varies whether this is a savings or a loss. This demonstrates 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.

- **DROP Member Contributions:** This is the value of the extra employee contributions going into the plan for the years during which the member would have already been retired had there not been a DROP but is still employed due to participation in the DROP.

- **Premium Tax Allocation:** This is the loss of premium allocation money for the period when a member is in DROP. The plan receives more premium tax money for each active member (whether a member in this plan or the State plan) than for each retiree. Members who elect DROP are 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 into the State plan 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 are considered retired during the DROP period. 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, resulting in a total annual loss of premium tax allocation of approximately $7,800 per DROP member. While the DROP increases the premium tax allocation available to the other plans covered by MPOB, it decreases the premium tax allocation available to the plan.

- **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, 2018 for the plans that participated in a DROP as of July 1, 2018.

Impact Item	St. Albans Fire	St. Albans Police	Wheeling Fire
Payment Trade-off	178,864	15,913	(46,538)
Drop Member Contributions	(28,766)	0	(142,116)
Premium Tax Allocation	69,346	2,149	279,686
Delay of New Hires	(117,180)	0	(915,028)
Net (Gain)/Loss	102,264	18,062	(823,996)

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, 2018 valuations:

- The funded ratio improved from 24% last year to 26% this year
- The unfunded liability increased $21 million from $1.145 billion to $1.166 billion, an increase of 1.8%
- Total recommended contributions including estimated employee contributions increased $3.6 million from $74.8 million to $78.4 million, an increase of 4.8%
- Net municipality recommended contributions increased $2.4 million from $50.1 million to $52.5 million, an increase of 4.8%
- The State premium tax allocation increased by $1.1 million from $18.5 million to $19.6 million, an increase of 5.9%
- Liabilities increased 3.8% and experienced a loss of approximately 1.6%
- Assets increased 10.1%, with a total return on assets of 6.1%, slightly above the weighted average discount rate of 5.22%
- The return on assets for the fiscal year ending June 30, 2018 for each plan ranged from 2.3% to 10.5%
- The gross normal cost decreased 4.8%, which is a result of the closed plans
- 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 funded status improved largely due to the increase in contributions. The primary cause of the increase in the expected contributions is that the Alternative and Conservation funding policies are designed to have significant increases in the contributions each year. There was a 1.6% loss on liabilities due primarily to demographic changes (e.g. higher than expected salary increases). The assets return was slightly better than expected resulting in a gain of approximately 0.8%. The gross Normal Cost, which measures the cost of an additional year of service for active employees, decreased due to the fact that plans under the Optional and Conservation funding policies are closed to new hires. The Normal Cost reduction is caused by terminating and retiring employees who are not replaced by new hires that participate in the local municipal plans. 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 plan.

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, 2018 valuation, 13 years for Standard plans and Optional from Standard plans, and 31.5 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 15 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.
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, 2017[6]	July 1, 2018
1. Actives		
a. Number	1,476	1,430
b. Average Age	39.3	39.5
c. Average Service	12.1	12.5
d. Average Salary	$ 51,937	$ 57,127
2. Retirees		
a. Number	1,370	1,389
b. Average Age	N/A	66.6
c. Total Annual Benefits	$ 49,004,941	$ 50,581,817
3. Survivors		
a. Number	491	518
b. Average Age	N/A	73.7
c. Total Annual Benefits	$ 7,178,117	$ 7,749,547
4. Disableds		
a. Number	280	276
b. Average Age	N/A	61.2
c. Total Annual Benefits	$ 6,739,693	$ 6,767,766
5. Deferred Vesteds		
a. Number	33	32
b. Average Age	N/A	46.7
c. Total Annual Benefits	$ 1,216,438	$ 1,200,689
6. Members Owed Refunds		
a. Number	N/A	40
b. Average Age	N/A	34.9
c. Total Refunds Owed	$ 704,562	$ 618,942

[6] Average ages for Retirees, Survivors, Disables, and Deferred Vesteds were not provided in the July 1, 2017 valuation report prepared by the prior actuary.

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, 2018.

Credited Service as of July 1, 2018

Participant Age	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up	Total
Under 25	79	-	-	-	-	-	-	**79**
	46,783	-	-	-	-	-	-	**46,782**
25 - 29	113	46	1	-	-	-	-	**160**
	48,115	52,948	67,122	-	-	-	-	**49,623**
30 - 34	64	93	60	2	-	-	-	**219**
	49,520	52,887	55,166	57,826	-	-	-	**52,573**
35 - 39	30	66	133	31	1	-	-	**261**
	46,743	51,943	57,994	59,073	78,752	-	-	**55,378**
40 - 44	4	32	80	111	32	-	-	**259**
	50,161	53,503	57,477	60,376	62,130	-	-	**58,690**
45 - 49	2	9	43	115	132	26	-	**327**
	51,164	54,088	55,744	61,199	68,424	68,943	-	**63,757**
50 - 54	-	-	3	39	30	16	4	**92**
	-	-	40,713	61,073	67,102	67,433	61,585	**63,504**
55 - 59	2	-	2	3	10	5	7	**29**
	51,963	-	51,931	58,456	60,626	77,332	74,170	**65,354**
60 - 64	-	-	-	-	1	1	2	**4**
	-	-	-	-	63,595	82,076	78,465	**75,650**
65 & Up	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Totals	**294**	**246**	**322**	**301**	**206**	**48**	**13**	**1,430**
	47,998	**52,769**	**56,868**	**60,610**	**66,902**	**69,587**	**70,958**	**57,127**

Averages

Age	39.5
Service	12.5

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: 7.0% of compensation.
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 2018, indexed by state minimum wage for years after 2018) or less.

Termination Benefits

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 Eligibilty

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 (13 years remaining as of July 1, 2018). 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, 2018, is 13 years for sponsors who previously used the Standard funding policy and 31.5 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 – 31.5 years remaining as of July 1, 2018).
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 – 13 years remaining as of July 1, 2018).
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 – 31.5 years remaining as of July 1, 2018).

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 through 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.

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[7]	Liquidity Ratio[8]	Equity Exposure[9]	Projected Funded Ratio after 15 Years[6]	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%

[7] 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).
[8] Liquidity ratio equals assets as of the actuarial valuation date divided by expected benefit payments for the year.
[9] 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, 2019, includes a Base Allocation of $8,709,689, an Excess Allocation of $10,790,377, and an Expired Premium Tax Allocation of $387,136.

(5) For the plan year ending June 30, 2019, all Pension and Relief Funds reported a total of 1,739 eligible active members and 2,165 eligible retired members. All Plans are eligible to receive a premium tax allocation for the fiscal year ending June 30, 2020.

(6) The total premium tax allocation is assumed to increase by 2.75% in calendar years ending on and after 2020.

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, recognizing this assumption will be evaluated in the next experience study. 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 Employee[10] 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.

[10] *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[11]
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.

[11] 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

The premium tax allocation was changed to re-allocate the premium for plans that are projected to be 100% funded in the projection period to other plans. The previous valuation did not reallocate these contributions. Fifteen municipalities had a change in their discount rate, but the method for selecting the discount rate did not change.

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.