Municipal Pensions Oversight Board

City of Charleston
West Virginia
Firemen's Pension Plan

Actuarial Valuation as of July 1, 2020
to Determine the City's Contribution for
the Fiscal Year Ending June 30, 2022

Bolton

Submitted by:

James E. Ritchie, ASA, EA, FCA, MAAA
President Bolton Retirement
443.573.3924
jritchie@boltonusa.com

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

Bolton
Employee Benefits, Actuarial & Investment Consulting

September 24, 2021

Honorable Victor Grigoraci
City Treasurer
501 Virginia Street, East
Charleston, WV 25301

Assistant Chief William "Chad" Jones
Pension Board Secretary
City of Charleston
Firemen's Pension and Relief Fund

Re: City of Charleston Firemen's Pension and Relief Fund
Actuarial Valuation Report for the Year Beginning July 1, 2020

Dear Honorable Grigoraci and Assistant Chief Jones:

The following sets forth the actuarial valuation of the City of Charleston Firemen's Pension and Relief Fund as of July 1, 2020. Sections I and II of the report provide a summary of results and the actuarial certification, respectively. Sections III and IV contain the development of the City's contribution for the 2022 fiscal year. Section V contains asset information. Sections VI and VII provide experience gain/loss and risk measure information, respectively. Section VIII provides projections. Sections IX through XI provide a summary of the census data, plan provisions, assumptions and actuarial methods. Section XII provides a glossary of many of the terms used in this report.

The purposes of this report are to provide information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2022, based on the selected funding policy, i.e. the **Conservation** funding policy as defined in West Virginia Code §8-22-20(c)(1)
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2022
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2022

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

Table of Contents

Section I. Executive Summary

Background

Bolton has prepared the following report that sets forth the actuarial valuation of the City of Charleston Firemen's Pension and Relief Fund (the Plan) as of July 1, 2020. Please note that some columns and rows in the tables on the following pages may not add due to rounding.

Funding Policy

The Plan is valued using the Conservation funding policy as described in WV Code §8-22-20. The City of Charleston (the City) switched from the Alternative funding policy to the Conservation funding policy effective July 1, 2011.

Summary of Results

The following table presents a two-year summary of the Plan's estimated pension contributions.

Total Contribution Summary		FYE 2021		FYE 2022
Benefit Payment Account				
1. Net City Contribution	$	7,137,850	$	7,496,214
2. Premium Tax Allocation	$	875,179	$	960,956
Premium Tax Percent		44.58%		51.62%
3. Employee Contributions	$	381,519	$	374,182
4. Total Contribution (1. + 2. + 3.)	**$**	**8,394,548**	**$**	**8,831,352**
Accumulation Account				
5. Net City Contribution	$	0	$	0
6. Premium Tax Allocation	$	1,088,117	$	900,528
Premium Tax Percent		55.42%		48.38%
7. Employee Contributions	$	87,977	$	86,298
8. Total Contribution (5. + 6. + 7.)	**$**	**1,176,094**	**$**	**986,826**
Total				
9. Net City Contribution	$	7,137,850	$	7,496,214
10. Premium Tax Allocation	$	1,963,296	$	1,861,484
11. Employee Contributions	$	469,496	$	460,480
12. Total Contribution (9. + 10. + 11.)	**$**	**9,570,642**	**$**	**9,818,178**

Amortization Period to Eliminate Unfunded Liability	FYE 2021	FYE 2022
1. Total City Contribution Plus Premium Tax	$ 9,101,146	$ 9,357,698
2. Net Employer Normal Cost with Interest	$ 2,741,476	$ 2,652,931
3. Payment Towards Unfunded Liability (1. – 2.)	$ 6,359,670	$ 6,704,767
4. Estimated Number of Years this 'Payment Towards Unfunded Liability' Would Take to Eliminate the Unfunded Liability	**Never**	**Never**

The following table presents a three-year historical summary of the Plan assets and liabilities.

	July 1, 2018	July 1, 2019	July 1, 2020
Actuarial Accrued Liability (AAL)	$ 190,005,438	$ 196,193,627	$ 197,719,787
Actuarial Value of Assets (AVA)	$ 20,062,367	$ 22,233,766	$ 24,185,663
Unfunded Actuarial Accrued Liability	$ 169,943,071	$ 173,959,861	$ 173,534,124
Funding Percentage	10.56%	11.33%	12.23%

The contributions shown above are assumed to be paid in equal monthly installments throughout the fiscal year. **Details of the determination of the City's contribution for FYE 2022 are shown in Section IV of this report.**

Please note, the Conservation policy does not meet the requirements for a reasonable funding method under standard actuarial principles. Plans funding under the Conservation policy may experience significant increases in the required contribution over time. In order to understand the ineffectiveness of the Conservation funding policy, we have shown the number of years it would take to completely payoff the unfunded liability assuming the amount shown for the plan year is paid for all future years until the unfunded liability is eliminated[1]. If "Never" is shown, the year's payment toward the unfunded does not cover the interest on the unfunded liability and the unfunded liability will be expected to increase in future years.

The City of Charleston's City Council passed Resolution Number 499-14 on September 15, 2014, which increased the City's sales and use tax rate from one-half percent to one percent and directed the proceeds from the additional one-half percent to a dedicated fund that is separate from the Plan's irrevocable trust. This dedicated fund, titled the Uniform Pension Reserve Fund, is used to pay a portion of the employer contribution used to fund the benefit payments under the Conservation funding policy. We understand from the City that the availability of this fund helps soften the burden of the growth in the projected employer contribution on the City's general fund. This fund has not been included in the asset values shown throughout the remainder of this report.

[1] This does not factor in any future increases in the contributions since scheduled increases might require a growing burden to the City.

Risk Measures

Generally, the primary risk that a plan sponsor incurs from a defined benefit plan is the risk of substantial increases in annual contributions. For plans that develop contributions using a generally accepted actuarial funding policy, these increases occur most frequently due to variation in the investment returns. The following table shows four commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee groups covered by the plan. More detail is provided later in this report.

Risk Measure	July 1, 2018	July 1, 2019	July 1, 2020	Conservative Measures
Inactive AAL Percent of Total AAL	70.4%	70.5%	69.0%	<50%
Assets (MVA) to Payroll	3.1	3.6	3.8	<5
Liabilities to Payroll	29.6	31.9	31.7	<5
Benefit Payments to Contributions	0.9	0.9	0.9	<3

Experience Analysis

The following factors affected the City's contribution as a percentage of payroll:

- The Plan uses the Conservation funding policy. City contributions between FY 2021 and FY 2022 are expected to increase $232,990 (3.21%) and benefit payments are expected to increase by $201,215.
- The discount rate changed from 4.50% to 4.25%.
- Liabilities increased by 0.8%, while the market value of assets and actuarial value of assets increased by 6.4%, and 8.8%, respectively.
- The Plan's funded ratio increased from 11.3% to 12.2% and the Plan is expected to be 100% funded in 2046.
- The return on the market value of assets for FY 2020 was 1.4%, while the return on the actuarial value of assets for FY 2020 was 3.78%.

Changes in Methods, Assumptions, and Plan Amendments

Pursuant to the 2020 *Actuarial Methods Recommendations Report*, the WV MPOB adopted changes to the following methods:

- Amortization method: for the Standard and Optional funding policies, the method was changed from a single, closed amortization base to a layered amortization approach.
- Asset method: the method was changed from the market value of assets to a four-year smoothed actuarial value of assets. The funded status is reported on this basis.
- Roll-forward method: for the Standard and Optional funding policies, the method was changed from developing contributions for the valuation year to rolling valuation results forward one year to better align the contribution calculation with the expected timing of the contribution.
- The above method changes do not impact the development of the contribution under the Conservation Method; however, they do impact the development of the Actuarially Determined Contribution for GASB purposes.

Additionally, there were changes to several assumptions. These changes are described in detail in *Section XII. Actuarial Methods and Assumptions*. All of the significant demographic assumptions were changed as well as the method used to determine the discount rate.

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

Sources of Information

The July 1, 2020 participant data and market value of assets were provided by or at the direction of the City of Charleston. While we have reviewed this data for consistency and completeness, we have not audited this data.

Supplemental Benefit 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 be calculated on only 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 benefit 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 fund as set forth in West Virginia Code §8-22-20. The related solvency test is discussed below.

Premium Tax

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 Municipal Pensions Oversight Board (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 plan 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 plan or the West Virginia MPFRS).

West Virginia Code §8-22-19 requires a plan sponsor to deposit into the pension fund 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.

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** policy, 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, 2020 valuation, the 15-year period would end on June 30, 2035. If the assets are greater than $1 for the first 15 years of the projection, the COLA must be granted. **Please note that the Conservation policy is not consistent with generally accepted actuarial principles for funding even though it does not result in insolvency.**

Actuarial Projections

Section VIII of this report provides long-range projections of assets, liabilities, funded status, and contributions for the pension fund. The purpose of the projections is to provide the municipality an understanding of the projected funded status and future contribution requirements. The projections are also used for the *Solvency Tests* described above.

Impact of COVID-19

Because the long-term net impact of COVID-19 on mortality, salary increases, and changes in turnover and retirement behavior is difficult to estimate at this time, we have not made any adjustments to the assumptions for the potential impact of the COVID-19 pandemic.

Section II. Actuarial Certification

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the City of Charleston Firemen's Pension and Relief Fund, together with a comparison of these liabilities with the value of the Plan assets, as submitted by the City of Charleston (the City). This calculation and comparison with assets is applicable for the valuation date only. The future is uncertain, and the Plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the Plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid and would produce different results, so that no one projection is uniquely "correct" and many alternative projections of the future could also be regarded as reasonable. The Plan's actual experience will differ from the assumptions; the differences may be significant or material because the results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the Plan and may not provide a specific assumption for those factors. The Plan may have used other assumptions in the past. We will likely consider changes in assumptions at a future date in conjunction with the MPOB.

A "sensitivity analysis" shows the degree to which results would be different if alternative assumptions within the range of possibilities were substituted for those utilized in this report. We have not been engaged to perform such a sensitivity analysis, and thus, the results of such an analysis are not included in this report. At the City's request, Bolton is available to perform such a sensitivity analysis.

The City is responsible for selecting the Plan's funding policy. The MPOB selects the actuarial valuation methods, asset valuation methods, and assumptions based on the advice of the plan's actuary. The policies, methods and assumptions used in this valuation are those that have been so prescribed by the MPOB, in consultation with Bolton, and are described in this report. The MPOB is solely responsible for communicating to Bolton any changes required thereto.

In addition, decisions regarding benefit improvements, benefit changes, the Plan's investment policy, and similar issues should not be based on this valuation. These issues are complex and other factors should be considered when making such decisions. Other factors might include the anticipated vitality of the local economy and future growth expectations, as well as other economic and financial factors.

The cost of this Plan is determined by the benefits promised by the Plan, the Plan's participant population, the investment experience of the Plan and many other factors. An actuarial valuation is a budgeting tool for the City. It does not affect the cost of the Plan. Different funding methods provide for different timing of contributions to the Plan. As the experience of the Plan evolves, it is normal for the level of contributions to the Plan to change. The Plan sponsor is responsible for funding the cost of the Plan. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. Despite our best efforts, we may make a mistake. We reserve the right to correct

any potential errors by amending the results of this report or by including the corrections in a future valuation report.

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the Plan.

The valuation was completed 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 is based on Plan provisions, census data, and asset data submitted by the City. We have relied on this information for purposes of preparing this report but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The Plan sponsor is solely responsible for the validity and completeness of this information.

The City of Charleston Firemen's Pension Fund Board of Trustees is solely responsible for selecting the Plan's investment policies, asset allocations and individual investments. Bolton's actuaries have not provided any investment advice to the Board.

The information in this report was prepared for the internal use of the MPOB, the West Virginia Legislature's Joint Committee on Pensions and Retirement, the City and their auditors in connection with their review of the City's financial statements and our actuarial valuation of the Plan. It is neither intended nor necessarily suitable for other purposes. Bolton is not responsible for the consequences of any other use or the reliance upon this report by any other party.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, the MPOB selected an assumption based on the expected long-term rate of return on Plan investments, the funded status (current and projected), and funding policy. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

Because valuations are a snapshot in time and are based on estimates and assumptions that are not precise and will differ from actual experience, contribution calculations are inherently imprecise. There is no uniquely "correct" level of Actuarially Determined Contribution (ADC) for the coming plan year. More importantly, the contribution required under the Conservation policy is not an ADC because it not determined based on actuarially sound principles.

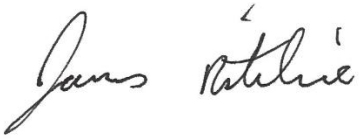
This report provides certain financial calculations for use by the City's auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.

The report is conditioned on the assumption of an ongoing Plan (open or closed plans) and is not meant to present the actuarial position of the Plan in the case of Plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: Plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status), and changes in Plan provisions or applicable law.

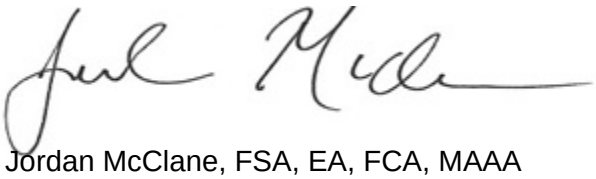
The MPOB, Pension Board or the City should notify Bolton promptly after receipt of this report if the City disagrees with anything contained in the report or is aware of any information that would affect the results of the report that has not been communicated to Bolton or incorporated therein. The report will be deemed final and acceptable unless the MPOB, Pension Board or the City promptly provides such notice to Bolton.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services, which could create a conflict of interest that would impair the objectivity of our work.

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



James Ritchie, ASA, EA, FCA, MAAA



Jordan McClane, FSA, EA, FCA, MAAA

Section III. Normal Cost and Liabilities

Net Employer Normal Cost

The breakdown of the Net Employer Normal Cost as of the valuation date is illustrated below.

Net Employer Normal Cost (BOY)		7/1/2019		7/1/2020
1. Normal Cost	$	3,154,864	$	3,273,665
2.a. Administrative Expenses (MOY)	$	8,433	$	5,903
2.b. Administrative Expenses (BOY)	$	8,249	$	5,781
3. Gross Normal Cost (1. + 2.b.)	$	3,163,113	$	3,279,446
4. Expected Employee Contributions (BOY)	$	481,314	$	489,654
5. Net Employer Normal Cost (3. – 4.)	$	2,681,799	$	2,789,792
(% of Compensation)		44.59%		45.60%

Projected Net Employer Normal Cost

The breakdown of the Projected Net Employer Normal Cost as of the first anniversary of the valuation date (i.e. the first day of the contribution year) is illustrated below.

Projected Net Employer Normal Cost (BOY)				
Valuation Date		7/1/2019		7/1/2020
Projection Date		7/1/2020		7/1/2021
1. Projected Normal Cost	$	N/A	$	3,043,361
2.a. Projected Administrative Expenses (MOY)	$	N/A	$	6,051
2.b. Projected Administrative Expenses (BOY)	$	N/A	$	5,926
3. Projected Gross Normal Cost (1. + 2.b.)	$	N/A	$	3,049,287
4. Projected Employee Contributions (BOY)	$	N/A	$	450,996
5. Projected Net Employer Normal Cost (3. – 4.)	$	N/A	$	2,598,291
(% of Compensation)		N/A		46.11%

Unfunded Actuarial Accrued Liability

Below is a summary of the key valuation results.

	7/1/2019		7/1/2020	
1. Actuarial Accrued Liability	Count		Count	
a. Active	103	$ 57,923,669	94	$ 61,247,821
b. Retirees	151	102,098,394	160	104,544,568
c. Survivors	49	10,592,006	46	9,502,739
d. Disableds	40	23,127,784	39	20,840,402
e. Deferred Vesteds	3	2,379,922	2	1,512,405
f. Former Members Due Refunds	1	71,852	1	71,852
g. Total	**347**	**$ 196,193,627**	**342**	**$ 197,719,787**
2. Present Value of Future Normal Costs		$ 24,016,325		$ 23,682,288
3. Present Value of Benefits (1.g. + 2.)		$ 220,209,952		$ 221,402,075
4. Actuarial Value of Assets		$ 22,233,766		$ 24,185,663
5. Unfunded Actuarial Accrued Liability (1.g. – 4.)		$ 173,959,861		$ 173,534,124
6. Funded Ratio (4. / 1.g.)		11.33%		12.23%

Projected Unfunded Actuarial Accrued Liability

The development of the Projected Unfunded Actuarial Accrued Liability as of the first anniversary of the valuation date (i.e. the first day of the contribution year) is illustrated below.

Projected Unfunded Actuarial Accrued Liability	7/1/2019	7/1/2020
1. Unfunded Actuarial Accrued Liability on Valuation Date	$ N/A	$ 173,534,124
2. Net Employer Normal Cost, Excluding Expenses (BOY)	$ N/A	$ 2,784,011
3. Expected Expenses (MOY)	$ N/A	$ 5,903
4. Expected Employer Contribution Fiscal Year Beginning on the Valuation Date	$ N/A	$ 7,137,850
5. Expected Premium Tax Allocation Fiscal Year Beginning on the Valuation Date	$ N/A	$ 1,963,296
6. Projected Unfunded Actuarial Accrued Liability on Valuation Date + 1 Year	$ N/A	$ 174,525,150

Section IV. Determination of City Contributions

Development of Minimum Required Contribution for Funding Purposes

The following table provides the estimated total contribution, city contribution, premium tax allocation and employee contributions for the benefit payment account and the accumulation account. We assumed that 48.38% of the premium tax allocation of $1,861,484 is deposited into the Accumulation Account and the remainder will be used for benefit payments. The basis of the premium tax allocation between the Benefit Payment Account and the Accumulation Account is developed from the projections in Section VIII.

Total Contribution Summary	FYE 2021	FYE 2022
Benefit Payment Account		
1. Net City Contribution	$ 7,137,850	$ 7,496,214
2. Premium Tax Allocation	$ 875,179	$ 960,956
Premium Tax Percent	44.58%	51.62%
3. Employee Contributions	$ 381,519	$ 374,182
4. Total Contribution (1. + 2. + 3.)	**$ 8,394,548**	**$ 8,831,352**
Accumulation Account		
5. Net City Contribution	$ 0	$ 0
6. Premium Tax Allocation	$ 1,088,117	$ 900,528
Premium Tax Percent	55.42%	48.38%
7. Employee Contributions	$ 87,977	$ 86,298
8. Total Contribution (5. + 6. + 7.)	**$ 1,176,094**	**$ 986,826**
Total		
9. Net City Contribution	$ 7,137,850	$ 7,496,214
10. Premium Tax Allocation	$ 1,963,296	$ 1,861,484
11. Employee Contributions	$ 469,496	$ 460,480
12. Total Contribution (9. + 10. + 11.)	**$ 9,570,642**	**$ 9,818,178**

Development of Actuarially Determined Contribution for GASB Purposes

The breakdown of the Actuarially Determined Contribution for GASB contribution reporting is illustrated below.

Estimated Minimum Employer Contribution	FYE 2021	FYE 2022
1. Projected Gross Normal Cost, Including Administrative Expenses (BOY)	$ 3,163,113	$ 3,049,287
2. Projected Employee Contributions (BOY)	$ 481,314	$ 450,996
3. Projected Net Employer Normal Cost (BOY) (1. – 2.)	$ 2,681,799	$ 2,598,291
4. Interest on Normal Cost	$ 59,677	$ 54,640
5. Projected Total Employer Normal Cost with Interest (3. + 4.)	$ 2,741,476	$ 2,652,931
6. Amortization of Projected Unfunded Liability	$ 10,139,378	$ 10,011,335
7. Interest on Projected Unfunded Liability Payment	$ 225,626	$ 210,527
8. Unfunded Liability Payment with Interest (6. + 7.)	$ 10,365,004	$ 10,221,862
9. Estimated Premium Tax Allocation	$ 1,963,296	$ 1,861,484
10. Unfunded Liability Payment Net of Premium Tax Allocation (8. – 9., not less than 0)	$ 8,401,708	$ 8,360,378
11. Net Employer Contribution (5. + 10.)	**$ 11,143,184**	**$ 11,013,309**
12. Actuarially Determined Contribution for GASB Purposes (5. + 8., not less than 0)	**$ 13,106,480**	**$ 12,874,793**

Schedule of Amortization Bases for Funding and GASB Purposes

Below is a schedule of the amortization bases as of July 1, 2021 used to develop the Actuarially Determined Contribution for GASB purposes.

Description	Date Established	Remaining Years	Outstanding Amount	Payment / (Credit)
Initial Unfunded	7/1/2021	28.5	$ 182,480,363	$ 10,709,718
Assumption and Method Changes	7/1/2021	15.0	$ (7,955,213)	$ (698,383)
Total			**$ 174,525,150**	**$ 10,011,335**

Section V. Assets

Asset Allocation

The table below shows the amount of funds invested in each account as of June 30, 2019 and June 30, 2020.

Assets Held by Category		June 30, 2019		June 30, 2020
Cash and Deposits	$	3,925,456	$	5,476,235
Receivables				
Contributions	$	0	$	0
Investment Income		35,733		24,245
Total Receivables	**$**	**35,733**	**$**	**24,245**
Investment				
Government Securities	$	3,293,972	$	0
Fixed Income		2,995,243		4,865,333
Equities		12,623,259		13,955,461
Alternative Investments		0		0
Other		0		0
Total Investments	**$**	**18,912,474**	**$**	**18,820,794**
Total Assets	**$**	**22,873,663**	**$**	**24,321,274**
Payables				
Investment Expense	$	0	$	0
Benefits and Withdrawals		639,897		674,258
Administrative Expense		0		0
Total Payables	**$**	**639,897**	**$**	**674,258**
Net Position	**$**	**22,233,766**	**$**	**23,647,016**

Reconciliation of Assets

Below is a reconciliation of assets (unaudited) from July 1, 2018 through June 30, 2020.

Plan Year Ending	June 30, 2019	June 30, 2020
1. Beginning of Year Market Value of Assets	$ 20,062,367	$ 22,233,766
Adjustments to Market Value of Assets	0	0
Beginning of Year Market Value of Assets	**$ 20,062,367**	**$ 22,233,766**
2. Additions		
a. Contributions		
(i) Local Government	$ 6,253,683	$ 6,489,575
(ii) State Government	1,781,609	1,952,515
(iii) Employee	509,721	603,480
(iv) Total	8,545,013	9,045,570
b. Receivable Contributions		
(i) Local Government	0	0
(ii) State Government	0	0
(iii) Employee Contributions	0	0
(iv) Total	0	0
c. Earnings on Investments		
(i) Net Appreciation/(Depreciation)	858,912	(42,574)
(ii) Net Realized Gain (Loss) on Sale/Exchange	0	0
(iii) Interest and Dividends	434,376	445,526
(iv) Other Income	0	0
(v) Investment Expense	(96,699)	(105,578)
(vi) Receivable Investment Income	35,733	24,245
(vii) Payable Investment Expenses	0	0
(viii) Net Investment Income	1,232,322	321,619
d. Other Revenue	0	0
e. Total Additions	**$ 9,777,335**	**$ 9,367,189**
3. Disbursements		
a. Benefit Payments	$ 6,960,338	$ 7,273,864
b. Withdrawals	0	0
c. Administrative Expenses		
(i) Municipal Fees	301	0
(ii) Other Expenses	5,400	5,817
(iii) Total Administrative Expenses	5,701	5,817
d. Payable Benefits and Withdrawals	639,897	674,258
e. Payable Administrative Expenses	0	0
f. Total Disbursements	**$ 7,605,936**	**$ 7,953,939**
4. Net Increase (2.e. – 3.f.)	2,171,399	1,413,250
5. Net Assets (1. + 4.)	**$ 22,233,766**	**$ 23,647,016**
6. Rate of Return Net of Investment Fees (2I / [A + B – I] Method[2])	6.0%	1.4%

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

(Gain)/Loss on Market Value of Assets for Plan Year Ended June 30, 2020

MVA (Gain)/Loss for Plan Year Ended June 30, 2020		
Market Value of Assets (MVA)		
a. MVA as of 7/1/2019	$	22,233,766
b. Interest on a. to 6/30/2020		1,000,519
c. Contributions with Interest to 6/30/2020		9,246,856
d. Benefit Payments with Interest to 6/30/2020		8,109,983
e. Administrative Expenses with Interest to 6/30/2020		5,946
f. Expected MVA at 6/30/2020 (a. + b. + c. – d. – e.)		24,365,212
g. Actual MVA at 6/30/2020		23,647,016
h. MVA (Gain)/Loss (f. - g.)		718,196

Development of Actuarial Value of Assets

The actuarial asset value as of July 1, 2020 is determined by spreading the asset gain or loss for each year over a four-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return on a market-value basis.

				July 1, 2020
1.	Market Value of Assets		$	23,647,016
2.	Spreading of Investment (Gains)/Losses			
	Fiscal Year	(Gain)/Loss	% Deferred	Amount Deferred
	2020	$ 718,196	75%	$ 538,647
	2019	0	50%	0
	2018	0	25%	0
	a. Total Deferred			538,647
3.	Actuarial Value of Assets (1. + 2.a.)		$	24,185,663
4.	Rate of Return Net of Investment Fees (2I / [A + B – I] Method)			3.78%

Section VI. Experience (Gain)/Loss

Experience (Gain)/Loss for Plan Year Ended June 30, 2020

Experience (Gain)/Loss for Plan Year Ended June 30, 2020		
1. Liabilities		
a. Actuarial Accrued Liability as of 7/1/2019	$	196,193,627
b. Normal Cost as of 7/1/2019		3,154,864
c. Interest on a. and b. to 6/30/2020		8,970,682
d. Benefit Payments with Interest to 6/30/2020		8,109,983
e. Effect of Assumption Changes		(7,202,170)
f. Expected Liability at 7/1/2020 (a. + b. + c. – d. + e.)		193,007,020
g. Actual Liability at 7/1/2020		197,719,787
h. Liability (Gain)/Loss (g. - f.)		4,712,767
2. Actuarial Value of Assets (AVA)		
a. AVA as of 7/1/2019	$	22,233,766
b. Interest on a. to 6/30/2020		1,000,519
c. Contributions with Interest to 6/30/2020		9,246,856
d. Benefit Payments with Interest to 6/30/2020		8,109,983
e. Administrative Expenses with Interest to 6/30/2020		5,946
f. Expected AVA at 6/30/2020 (a. + b. + c. – d. – e.)		24,365,212
g. Actual AVA at 6/30/2020		24,185,663
h. AVA (Gain)/Loss (f. - g.)		179,549
3. Total (Gain)/Loss (1.h. + 2.h.)	$	4,892,316

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.

Section VII. Risk Measures

Risk Measures

Generally, the primary risk that a plan sponsor incurs from a defined benefit plan is the risk of substantial increases in annual contributions. For plans that develop contributions using a generally accepted actuarial funding policy, these increases occur most frequently due to variation in the investment returns. The following table shows three commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee groups covered by the plan.

Risk Measure	July 1, 2018	July 1, 2019	July 1, 2020	Conservative Measures
Inactive AAL Percent of Total AAL	70.4%	70.5%	69.0%	<50%
Assets (MVA) to Payroll	3.1	3.6	3.8	<5
Liabilities to Payroll	29.6	31.9	31.7	<5
Benefit Payments to Contributions	0.9	0.9	0.9	<3

The current *Assets to Payroll* of 3.8 indicates that a 1% asset gain/loss is about 3.8% of the annual payroll. Similarly, the current *Liabilities to Payroll* of 31.7 indicates that a 1% change in liability is about 31.7% of the annual payroll.

The use of payroll in these risk measures is generally an easily available substitute for the employer's revenue and often reflects the employer's ability to afford the plan. However, this plan is closed to new entrants, and thus, the payroll figure used in these metrics generally does not align with revenue as it represents only current active members (as of July 1, 2020) who were hired prior to adopting the Conservation funding policy.

If the plan or employer were interested in doing more quantitative assessments of risks, the following are examples of analyses that could be performed:

- *Scenario Test:* A process for assessing the impact of one possible event, or several simultaneously or sequentially occurring possible events, on a plan's financial condition. For example, the effect of a layoff or reduction in workforce, or early retirement program.

- *Sensitivity Test:* A process for assessing the impact of a change in an actuarial assumption on an actuarial measurement. This could be a decrease in the valuation discount rate or a change in future life expectancies.

- *Stochastic Modeling:* A process for generating numerous potential outcomes by allowing for random variations in one or more inputs over time for the purpose of assessing the distribution of those outcomes. This analysis could show a range of potential future contribution levels and the likelihood of contributions increasing to a certain level.

- *Stress Test:* A process for assessing the impact of adverse changes in one or relatively few factors affecting a plan's financial condition. For example, a stress test could show the impact of a single year or period of several years with significant investment losses.

Section VIII. Projections

Table 1 – 40-Year Projection of Conservation Funding

Year End June 30	Number (BOY)		Total Payroll	Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio[4]
	Active	Non-Active		Assets[3] (BOY)	Benefit Payments	Expenses	Employer Contrib.	Employee Contrib.	Premium Tax Allocation	Investment Income	Assets[3] (EOY)			
2020	103	244	$6,140,177	$22,233,766	$7,948,122	$5,817	$6,489,575	$603,480	$1,952,515	$321,619	$23,647,016	$197,719,787	$174,072,771	11.96%
2021	94	248	$6,246,122	$23,647,016	$8,624,086	$9,949	$7,263,224	$530,627	$1,963,296	$5,853,656	$30,623,784	$200,730,233	$170,106,449	15.26%
2022	86	252	$5,753,217	$30,623,784	$8,825,301	$6,051	$7,496,214	$460,480	$1,861,484	$1,322,263	$32,932,873	$203,423,084	$170,490,211	16.19%
2023	79	255	$5,275,245	$32,932,873	$9,196,339	$6,129	$7,890,248	$422,263	$1,877,232	$1,420,408	$35,340,556	$205,615,484	$170,274,928	17.19%
2024	71	258	$4,793,953	$35,340,556	$9,558,481	$6,188	$8,239,769	$383,735	$1,962,442	$1,523,450	$37,885,283	$207,287,184	$169,401,901	18.28%
2025	64	261	$4,340,772	$37,885,283	$9,860,738	$6,266	$8,544,627	$347,476	$2,014,627	$1,631,989	$40,556,998	$208,488,970	$167,931,972	19.45%
2026	57	263	$3,804,398	$40,556,998	$10,213,716	$6,324	$8,904,873	$304,607	$2,068,117	$1,745,912	$43,360,467	$209,091,370	$165,730,903	20.74%
2027	49	267	$3,268,958	$43,360,467	$10,584,261	$6,401	$9,279,881	$261,727	$2,127,124	$1,865,490	$46,304,027	$209,049,989	$162,745,962	22.15%
2028	42	269	$2,864,602	$46,304,027	$10,840,121	$6,457	$9,526,073	$229,316	$2,196,997	$1,991,175	$49,401,010	$208,529,151	$159,128,141	23.69%
2029	37	270	$2,510,879	$49,401,010	$11,052,258	$6,533	$9,726,874	$201,007	$2,263,662	$2,123,363	$52,657,125	$207,570,233	$154,913,108	25.37%
2030	32	270	$2,104,421	$52,657,125	$11,297,549	$6,587	$9,959,846	$168,541	$2,338,710	$2,262,384	$56,082,470	$206,087,372	$150,004,902	27.21%
2031	25	270	$1,677,618	$56,082,470	$11,539,619	$6,595	$10,197,919	$134,375	$2,400,251	$2,408,452	$59,677,253	$204,049,625	$144,372,372	29.25%
2032	20	270	$1,294,964	$59,677,253	$11,757,748	$6,645	$10,408,441	$103,728	$2,463,330	$2,561,751	$63,450,110	$201,478,595	$138,028,485	31.49%
2033	15	270	$1,005,582	$63,450,110	$11,894,182	$6,694	$10,526,949	$80,545	$2,534,652	$2,722,732	$67,414,112	$198,490,622	$131,076,510	33.96%
2034	12	268	$751,083	$67,414,112	$12,005,353	$6,741	$10,611,299	$60,197	$2,618,719	$2,891,977	$71,584,210	$195,114,895	$123,530,685	36.69%
2035	8	266	$527,357	$71,584,210	$12,071,614	$6,761	$10,651,383	$42,248	$2,697,734	$3,069,940	$75,967,140	$191,395,556	$115,428,416	39.69%
2036	6	263	$401,063	$75,967,140	$12,053,133	$6,804	$10,560,329	$32,119	$2,854,351	$3,257,768	$80,611,770	$187,460,958	$106,849,188	43.00%
2037	5	258	$307,184	$80,611,770	$12,007,698	$6,819	$10,466,663	$24,617	$2,959,613	$3,456,206	$85,504,352	$183,351,712	$97,847,360	46.63%
2038	3	253	$228,568	$85,504,352	$11,930,683	$6,803	$10,354,980	$18,306	$3,036,681	$3,664,900	$90,641,733	$179,100,664	$88,458,931	50.61%
2039	3	248	$173,461	$90,641,733	$11,828,762	$6,837	$10,177,727	$13,900	$3,189,606	$3,884,777	$96,072,144	$174,740,672	$78,668,528	54.98%
2040	2	242	$110,482	$96,072,144	$11,721,939	$6,812	$10,032,219	$8,859	$3,272,429	$4,116,392	$101,773,292	$170,267,515	$68,494,223	59.77%
2041	1	237	$65,925	$101,773,292	$11,584,702	$6,811	$9,854,063	$5,284	$3,357,323	$4,359,540	$107,757,989	$165,717,766	$57,959,777	65.03%
2042	1	231	$42,119	$107,757,989	$11,420,099	$6,805	$9,646,085	$3,376	$3,444,338	$4,614,767	$114,039,651	$161,128,094	$47,088,443	70.78%
2043	0	225	$27,562	$114,039,651	$11,237,098	$6,765	$9,367,616	$2,208	$3,631,033	$4,883,633	$120,680,278	$156,520,858	$35,840,580	77.10%
2044	0	218	$15,167	$120,680,278	$11,041,566	$6,718	$9,124,349	$1,215	$3,724,975	$5,166,811	$127,649,344	$151,908,999	$24,259,655	84.03%
2045	0	212	$10,111	$127,649,344	$10,829,472	$6,696	$8,843,390	$810	$3,858,968	$5,464,358	$134,980,702	$147,314,482	$12,333,780	91.63%
2046	0	205	$7,561	$134,980,702	$10,604,728	$6,637	$8,483,813	$605	$4,120,330	$5,778,598	$142,752,683	$142,752,683	-	100.00%
2047	0	199	$3,692	$142,752,683	$10,370,450	$6,604	$8,684	$296	-	$5,848,960	$138,233,569	$138,233,569	-	100.00%
2048	0	192	$2,760	$138,233,569	$10,123,342	$6,531	$8,147	$222	-	$5,662,083	$133,774,148	$133,774,148	-	100.00%
2049	0	185	$1,203	$133,774,148	$9,866,566	$6,450	$7,147	$96	-	$5,477,935	$129,386,310	$129,386,310	-	100.00%
2050	0	178	-	$129,386,310	$9,599,505	$6,361	$6,361	-	-	$5,297,051	$125,083,856	$125,083,856	-	100.00%
2051	0	171	-	$125,083,856	$9,321,927	$6,264	$6,264	-	-	$5,120,034	$120,881,963	$120,881,963	-	100.00%
2052	0	165	-	$120,881,963	$9,035,338	$6,195	$6,195	-	-	$4,947,480	$116,794,105	$116,794,105	-	100.00%
2053	0	158	-	$116,794,105	$8,740,128	$6,080	$6,080	-	-	$4,779,954	$112,833,931	$112,833,931	-	100.00%
2054	0	151	-	$112,833,931	$8,436,725	$5,956	$5,956	-	-	$4,618,027	$109,015,233	$109,015,233	-	100.00%
2055	0	144	-	$109,015,233	$8,125,421	$5,822	$5,822	-	-	$4,462,279	$105,352,091	$105,352,091	-	100.00%
2056	0	137	-	$105,352,091	$7,806,570	$5,677	$5,677	-	-	$4,313,300	$101,858,821	$101,858,821	-	100.00%
2057	0	131	-	$101,858,821	$7,480,623	$5,564	$5,564	-	-	$4,171,691	$98,549,889	$98,549,889	-	100.00%
2058	0	124	-	$98,549,889	$7,148,200	$5,398	$5,398	-	-	$4,038,052	$95,439,741	$95,439,741	-	100.00%
2059	0	117	-	$95,439,741	$6,810,077	$5,221	$5,221	-	-	$3,912,981	$92,542,645	$92,542,645	-	100.00%
2060	0	110	-	$92,542,645	$6,467,218	$5,031	$5,031	-	-	$3,797,064	$89,872,491	$89,872,491	-	100.00%
2061	0	104	-	$89,872,491	$6,120,831	$4,875	$4,875	-	-	$3,690,867	$87,442,527	$87,442,527	-	100.00%

[3] Market value of assets used.

Table 1 – 40-Year Projection of Conservation Funding (cont.)

Year End June 30	Benefit Payment Account[4]						Transfer (To)/From Accumulation Account	Accumulation Account					
	Assets[5] (BOY)	Net Benefit Pmts and Expenses	Employer Contrib.	Employee Contrib.	51.62% of Premium Tax Allocation	Investment Income		Assets[5] (BOY)	Net Benefit Pmts and Expenses	Employer Contrib.	1.50% of Pay Employee Contrib.	48.38% of Premium Tax Allocation	Investment Income
2020													
2021													
2022	(683,309)	$8,831,352	$7,496,214	$374,182	$960,956	(29,041)	$712,350	$31,307,093	-	-	$86,298	$900,528	$1,351,304
2023	-	$9,202,468	$7,890,248	$343,134	$969,086	-	-	$32,932,873	-	-	$79,129	$908,146	$1,420,408
2024	-	$9,564,669	$8,239,769	$311,826	$1,013,074	-	-	$35,340,556	-	-	$71,909	$949,368	$1,523,450
2025	-	$9,867,004	$8,544,627	$282,364	$1,040,013	-	-	$37,885,283	-	-	$65,112	$974,614	$1,631,989
2026	-	$10,220,040	$8,904,873	$247,541	$1,067,626	-	-	$40,556,998	-	-	$57,066	$1,000,491	$1,745,912
2027	-	$10,590,662	$9,279,881	$212,693	$1,098,088	-	-	$43,360,467	-	-	$49,034	$1,029,036	$1,865,490
2028	-	$10,846,578	$9,526,073	$186,347	$1,134,158	-	-	$46,304,027	-	-	$42,969	$1,062,839	$1,991,175
2029	-	$11,058,791	$9,726,874	$163,344	$1,168,573	-	-	$49,401,010	-	-	$37,663	$1,095,089	$2,123,363
2030	-	$11,304,136	$9,959,846	$136,975	$1,207,315	-	-	$52,657,125	-	-	$31,566	$1,131,395	$2,262,384
2031	-	$11,546,214	$10,197,919	$109,211	$1,239,084	-	-	$56,082,470	-	-	$25,164	$1,161,167	$2,408,452
2032	-	$11,764,393	$10,408,441	$84,304	$1,271,648	-	-	$59,677,253	-	-	$19,424	$1,191,682	$2,561,751
2033	-	$11,900,876	$10,526,949	$65,461	$1,308,466	-	-	$63,450,110	-	-	$15,084	$1,226,186	$2,722,732
2034	-	$12,012,094	$10,611,299	$48,931	$1,351,864	-	-	$67,414,112	-	-	$11,266	$1,266,855	$2,891,977
2035	-	$12,078,375	$10,651,383	$34,338	$1,392,654	-	-	$71,584,210	-	-	$7,910	$1,305,080	$3,069,940
2036	-	$12,059,937	$10,560,329	$26,103	$1,473,505	-	-	$75,967,140	-	-	$6,016	$1,380,846	$3,257,768
2037	-	$12,014,517	$10,466,663	$20,009	$1,527,845	-	-	$80,611,770	-	-	$4,608	$1,431,768	$3,456,206
2038	-	$11,937,486	$10,354,980	$14,877	$1,567,629	-	-	$85,504,352	-	-	$3,429	$1,469,052	$3,664,900
2039	-	$11,835,599	$10,177,727	$11,298	$1,646,574	-	-	$90,641,733	-	-	$2,602	$1,543,032	$3,884,777
2040	-	$11,728,751	$10,032,219	$7,202	$1,689,330	-	-	$96,072,144	-	-	$1,657	$1,583,099	$4,116,392
2041	-	$11,591,513	$9,854,063	$4,295	$1,733,155	-	-	$101,773,292	-	-	$989	$1,624,168	$4,359,540
2042	-	$11,426,904	$9,646,085	$2,744	$1,778,075	-	-	$107,757,989	-	-	$632	$1,666,263	$4,614,767
2043	-	$11,243,863	$9,367,616	$1,795	$1,874,452	-	-	$114,039,651	-	-	$413	$1,756,581	$4,883,633
2044	-	$11,048,284	$9,124,349	$987	$1,922,948	-	-	$120,680,278	-	-	$228	$1,802,027	$5,166,811
2045	-	$10,836,168	$8,843,390	$658	$1,992,120	-	-	$127,649,344	-	-	$152	$1,866,848	$5,464,358
2046	-	$10,611,365	$8,483,813	$492	$2,127,043	-	$17	$134,980,702	-	-	$113	$1,993,287	$5,778,598
2047	-	-	-	-	-	-	-	$142,752,683	$10,377,054	$8,684	$296	-	$5,848,960
2048	-	-	-	-	-	-	-	$138,233,569	$10,129,873	$8,147	$222	-	$5,662,083
2049	-	-	-	-	-	-	-	$133,774,148	$9,873,016	$7,147	$96	-	$5,477,935
2050	-	-	-	-	-	-	-	$129,386,310	$9,605,866	$6,361	-	-	$5,297,051
2051	-	-	-	-	-	-	-	$125,083,856	$9,328,191	$6,264	-	-	$5,120,034
2052	-	-	-	-	-	-	-	$120,881,963	$9,041,533	$6,195	-	-	$4,947,480
2053	-	-	-	-	-	-	-	$116,794,105	$8,746,208	$6,080	-	-	$4,779,954
2054	-	-	-	-	-	-	-	$112,833,931	$8,442,681	$5,956	-	-	$4,618,027
2055	-	-	-	-	-	-	-	$109,015,233	$8,131,243	$5,822	-	-	$4,462,279
2056	-	-	-	-	-	-	-	$105,352,091	$7,812,247	$5,677	-	-	$4,313,300
2057	-	-	-	-	-	-	-	$101,858,821	$7,486,187	$5,564	-	-	$4,171,691
2058	-	-	-	-	-	-	-	$98,549,889	$7,153,598	$5,398	-	-	$4,038,052
2059	-	-	-	-	-	-	-	$95,439,741	$6,815,298	$5,221	-	-	$3,912,981
2060	-	-	-	-	-	-	-	$92,542,645	$6,472,249	$5,031	-	-	$3,797,064
2061	-	-	-	-	-	-	-	$89,872,491	$6,125,706	$4,875	-	-	$3,690,867

[4] Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.
[5] Market value of assets used.

Section IX. 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, 2019	July 1, 2020
1. Actives		
a. Number	103	94
b. Average Age	44.8	45.1
c. Average Service	17.5	17.6
d. Average Salary	$ 62,113	$ 69,769
2. Retirees		
a. Number	151	160
b. Average Age	66.5	66.4
c. Total Annual Benefits	$ 5,931,087	$ 6,460,827
3. Survivors		
a. Number	49	46
b. Average Age	74.0	74.8
c. Total Annual Benefits	$ 804,784	$ 776,980
4. Disableds		
a. Number	40	39
b. Average Age	58.0	58.8
c. Total Annual Benefits	$ 1,101,891	$ 1,086,514
5. Deferred Vesteds		
a. Number	3	2
b. Average Age	47.7	47.6
c. Total Annual Benefits	$ 117,570	$ 77,380
6. Members Owed Refunds		
a. Number	1	1
b. Average Age	46.9	47.9
c. Total Refunds Owed	$ 71,852	$ 71,852

Active Age/Service Distribution Including Compensation

Shown below is the age and service distribution of active participants in the City of Charleston Firemen's Pension and Relief. The compensation shown is the average projected pay for the plan year beginning July 1, 2020.

Credited Service as of July 1, 2020

Participant Age

	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up	Total
Under 25	-	-	-	-	-	-	-	**-**
	-	-	-	-	-	-	-	**-**
25 - 29	-	-	-	-	-	-	-	**-**
	-	-	-	-	-	-	-	**-**
30 - 34	-	-	4	-	-	-	-	**4**
	-	-	59,336	-	-	-	-	**59,336**
35 - 39	-	-	14	3	-	-	-	**17**
	-	-	61,506	76,103	-	-	-	**64,082**
40 - 44	-	-	10	6	5	-	-	**21**
	-	-	70,176	71,921	76,021	-	-	**72,066**
45 - 49	-	-	10	10	11	2	-	**33**
	-	-	65,079	69,489	80,606	71,592	-	**71,986**
50 - 54	-	-	-	10	2	6	-	**18**
	-	-	-	65,631	67,619	79,445	-	**70,457**
55 - 59	-	-	-	1	-	-	-	**1**
	-	-	-	74,433	-	-	-	**74,433**
60 - 64	-	-	-	-	-	-	-	**-**
	-	-	-	-	-	-	-	**-**
65 & Up	-	-	-	-	-	-	-	**-**
	-	-	-	-	-	-	-	**-**
Totals	**-**	**-**	**38**	**30**	**18**	**8**	**-**	**94**
	-	**-**	**64,499**	**69,516**	**77,889**	**77,482**	**-**	**69,769**

Averages

Age	45.1
Service	17.6

Participant Reconciliation

Shown below is the reconciliation of participants between the prior and current valuation date.

	Actives	Retirees	Survivors	Disableds	Deferred Vesteds	Due Refund	Total
Participants as of 7/1/2019	103	151	49	40	3	1	347
New	-	-	-	-	-	-	-
Rehired	-	-	-	-	-	-	-
Terminated - Vested	-	-	-	-	-	-	-
Terminated - Nonvested	-	-	-	-	-	-	-
Disabled	-	-	-	-	-	-	-
Retired	(9)	10	-	-	(1)	-	-
Paid Refund	-	-	-	-	-	-	-
Payments Expired	-	-	-	-	-	-	-
Deceased - No Survivor	-	(1)	(3)	(1)	-	-	(5)
Deceased - With Survivor	-	-	-	-	-	-	-
New Beneficiary	-	-	-	-	-	-	-
New QDRO	-	-	-	-	-	-	-
Corrections	-	-	-	-	-	-	-
Participants as of 7/1/2020	**94**	**160**	**46**	**39**	**2**	**1**	**342**

Section X. 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. If the fund 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 this Plan.

Credited Service

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

> Absence from the 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: 8.00% of compensation.
Participating employees hired on or after January 1, 2010: 9.50% of compensation.

Employer Contributions

The municipality has elected to contribute the minimum employer contribution under the Conservation 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, as described in the National Fire Protection Association (NFPA) Standard 1582's Chapter 9 Essential Job Tasks - Specific Evaluations of Medical Conditions in Members.

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. For permanent disabilities, the benefit is paid for life, while for temporary disabilities, the benefit is paid during the disability period not to exceed 26 weeks.

Ordinary (non line-of-duty) 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 2020, indexed by state minimum wage for years after 2020) or less.

Termination Benefits

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

Refunds: Any member who terminates from their department with fewer than 20 years of credited service and prior to age 65 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 municipal plan is still open as of such date) the department must repay to the pension fund 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

For surviving spouses, this benefit is equal to 60% of the participant's benefit at the participant's date of retirement and is indexed for cost-of-living adjustments through the commencement date of this death benefit (and annually each July thereafter) using the methodology outlined in the *Supplemental Benefit (Cost of Living Adjustment – COLA)* subsection below. This benefit may not be less than $300 per month and is payable to the spouse until death or remarriage.

Other dependents (children, parents, brothers and sisters) are also eligible for death benefits. Similar to the death benefit payable to a surviving spouse, these death benefits are derived at the participant's date of retirement and indexed for COLAs. To each dependent:

- Child: 20% of the participant's benefit until the child attains age 18 or marries; for a disabled child, payments continue beyond age 18 if the child remains disabled.
- Orphaned child: 25% of the participant's benefit until the child attains age 18 or marries; for a disabled orphaned child, payments continue beyond age 18 if the child remains disabled.
- Parent: 10% of the participant's benefit for life.
- Sibling: the sum of fifty dollars per month (but a total not to exceed $100 per month) until such individual attains the age of age 18 or marries.

The total amount, derived as the participant's date of retirement, of all benefits payable to survivors cannot exceed the amount of the participant's benefit at the participant's date of retirement. Due to the COLA methodology, the sum of the benefits payable to survivors as of any time after the participant's date of retirement *may*, in some circumstances, exceed the participant's benefit amount. 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)

If a plan meets the criteria outlined in the *Supplemental Benefit Eligibility* subsection within *Section I. Executive Summary*, then all retirees, surviving beneficiaries, and disability pensioners shall be granted 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. The consumer price index currently used to determine the supplemental benefit 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.

Changes in Plan Provisions Since Prior Valuation

None.

Section XI. Actuarial Methods and Assumptions

Actuarial Cost Method

The actuarial valuation uses 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. Prior to the July 1, 2020 actuarial valuation, the unfunded actuarial accrued liability was amortized over a single, closed period of 40-years from July 1, 1991, using level dollar amortization (10.0 years remaining as of July 1, 2020). Beginning with the July 1, 2020 valuation, the unfunded actuarial accrued liability as of July 1, 2019 continues to be amortized over that same closed, decreasing period but new bases will be amortized using a layered approach with the following initial amortization periods when each base is created:

    - Experience gains and losses: 15 years
    - Assumption changes: 15 years
    - Plan changes: 5 years

    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 State premium tax allocation is contributed in addition to the employer contributions.

    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.

- **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, 2020 is 10.0 years for sponsors who previously used the Standard funding policy and 28.5 years for sponsors who previously used the Alternative funding policy. Beginning with the July 1, 2020 valuation, the unfunded actuarial accrued liability as of July 1, 2019 continues to be amortized over those same closed, decreasing periods but new bases will be amortized using a layered approach using the same amortization periods as those used in the Standard Funding Policy listed above.

For plans that switch to the Optional Funding policy on or after the July 1, 2020 valuation, the initial unfunded actuarial accrued liability prior to any assumption changes or plan changes that became effective during the year ending on the valuation date will be amortized over the maximum of 15 years and the remaining period described above (10.0 years for sponsors who previously used the Standard funding policy and 28.5 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 plan – The Municipal Police Officers and Firefighters Retirement System (MPFRS).

The Optional funding policy is consistent with generally accepted actuarial standards of practice.

- **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.

  The Conservation funding policy is not consistent with generally accepted actuarial principles.

This Plan is valued using the **Conservation** funding policy.

Amortization Method for GASB

Amortization Policies	
Standard and Optional Funding Policies	Same as for funding purposes (described above)
Alternative and Conservation Funding Policies	The methodology used for plans that switch to the Optional funding policy on or after July 1, 2020 for funding purposes (described above)

Basis for Selection of Actuarial Methods

While the funding policies and funding amortization methodology are defined in the West Virginia Code, the following actuarial methods used in the valuation were set by the MPOB on the basis of Bolton's 2020 *Actuarial Methods Recommendation Report*. These actuarial methods are, in the opinion of the actuaries signing this report, reasonable for the intended purpose.

Asset Method

Actuarial Value of Assets using four-year smoothing. Returns on the average market value of assets above or below the assumed rate of return are gradually recognized using straight-line amortization over a four-year period.

Roll-Forward Method

For the actuarially-based funding policies (Standard and Optional), valuation results are rolled forward one year to align the contribution calculation with the contribution year:

- To develop the projected unfunded actuarial accrued liability (UAAL), the UAAL on the valuation date is increased by the employer normal cost (which is net of employee contributions) and expected expenses, both with interest, and decreased by the expected employer contribution, including the premium tax allocation, for the fiscal year beginning on the valuation date, with interest.
- The projected normal cost for the contribution year is derived using a valuation software projection (open-group projection for plans open to new entrants and closed-group projection for plans closed to new entrants).

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 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.

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 (e.g. Charleston Fire) 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, 2021, includes a Base Allocation of $8,709,689, an Excess Allocation of $10,792,704, and an Expired Premium Tax Allocation of $325,849.

(5) For the plan year ending June 30, 2021, all Pension and Relief Funds reported a total of 1,721.23 eligible active members and 2,207.00 eligible retired members. The City of Charleston Firemen's Pension and Relief Fund reported 147.25 eligible active members and 247.00 eligible retired members, based on the average number of plan participants for the 12-month period ending June 30, 2021. The Fund is eligible to receive a premium tax allocation of $1,861,484.23 for the fiscal year ending June 30, 2022.

(6) The total premium tax allocation is assumed to increase by 2.50% in calendar years ending on and after 2022.

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 2020 covering the period July 1, 2014 through July 1, 2017. 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:

Discount Rate Matrix for Plans Not Investing with the IMB				
Funded Ratio as of Valuation Date[6]	Equity Exposure[7]	Projected Funded Ratio after 15 Years[6]	Discount Rate – Standard and Optional Policies	Discount Rate – Alternative and Conservation Policies
30% or more	60% or more	70% or more	6.50%	6.25%
30% or more	50% or more	70% or more	6.25%	6.00%
30% or more	40% or more	60% or more	6.00%	5.50%
15% or more	30% or more	50% or more	5.75%	5.00%
15% or more	20% or more	40% or more	5.50%	4.75%
Less than 15%	Less than 20%	15% or more	5.00%	4.25%
Less than 15%	Less than 20%	Less than 15%	5.00%	4.00%

Discount Rate Matrix for Plans Investing with the IMB				
Funded Ratio as of Valuation Date[6]	Equity Exposure[7]	Projected Funded Ratio after 15 Years[6]	Discount Rate – Standard and Optional Policies[8]	Discount Rate – Alternative and Conservation Policies
30% or more	N/A	70% or more	7.00%	6.50%
30% or more	N/A	70% or more	7.00%	6.00%
15% or more	N/A	50% or more	7.00%	5.50%
15% or more	N/A	40% or more	7.00%	5.25%
Less than 15%	N/A	15% or more	7.00%	4.75%
Less than 15%	N/A	Less than 15%	7.00%	4.50%

As of June 30, 2020	
Plan Investing with the IMB	No
Actuarially-Based Funding Policy	No
Actuarial Value of Assets	$24,185,663
Liabilities Using a 5.0% Discount Rate	$178,881,214
Funded Ratio	13.52%
Equity Exposure	55%
Projected Funded Ratio after 15 Years	41%
Discount Rate	**4.25%**

[6] Funded ratios based on a 6.0% investment return assumption for plans using an actuarially sound funding policy (Standard or Optional) and a 5.0% investment return assumption for other plans (Alternative or Conservation).
[7] Based on target allocation percentage outlined in the investment policy.
[8] Assumes the IMB maintains a current growth asset target above 70%. If this policy changes, the assumption should be reviewed.

Salary Increases

The following assumed rates are used:

Years of Service	Increase
0	20.00%
1	9.00%
2	6.50%
3	6.00%
4-28	5.00%
29-33	4.00%
34+	3.50%

Pay Spiking

City of Charleston has indicated that unused accrued leave time (vacation and sick) is included in pensionable earnings used to compute the average annual compensation and, as such, a load of 6% is applied to active retirement and active termination pension benefits.

Inflation

2.50%, compounded annually.

Cost of Living Increase in Benefits

2.50% 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.

Mortality

Pre-Retirement

SOA PubS-2010(B) Employee[9] Mortality Table[10] with the 2010 base rates projected generationally from 2010 using the SOA Mortality Improvement **Scale MP-2019**.

Post Retirement

For Healthy Retirees and Beneficiaries:

SOA PubS-2010(B) Healthy Retiree Mortality Table with the 2010 base rates projected generationally from 2010 using the SOA Mortality Improvement **Scale MP-2019.**

For Disabled Retirees:

SOA PubS-2010 Disabled Retiree Mortality Table with the 2010 base rates **set forward five years** and projected generationally from 2010 using the SOA Mortality Improvement **Scale MP-2019.**

Mortality improvement projections to the valuation date represent current mortality and mortality improvement projections beyond the valuation date represent future mortality improvement.

[9] Table name abbreviations from *Society of Actuaries Pub-2010 Public Retirement Plans Mortality Tables Report* published in January 2019. For example, *PubS-2010(B) Employee* translates to the Amount-Weighted Public Safety 2010 Below Median Employee Mortality Table.

[10] *Assumes 10% of deaths are duty-related and 90% are non-duty related.*

Retirement Rates

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

Age	Fire	Police
50	55%	60%
51-52	35%	40%
53-54	25%	40%
55-56	25%	50%
57-59	25%	40%
60	100%	100%

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.

Termination of Employment

Sample termination rates are as follows:

Age	Fire	Police
20	15%	25%
25	7%	10%
30	5%	8%
35	2%	6%
40	2%	3.5%
45	1%	2%
50	0%	0%

Disability Rates

Sample disability rates are as follows:

Age	Rates[11]
30	0.33%
40	0.76%
50	1.18%

Marital Status

70% assumed to be married with wives 3 years younger than husbands. Widows and widowers are not expected to re-marry in the future.

[11] Assumes that 50% of disabilities are duty related and 50% are non-duty related. Also assumes that 5% of non-duty disabled members receive a 20% reduction in benefits through age 65 due to gainful employment.

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.

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.

Non-Spouse Beneficiaries

Pre-retirement death benefits are loaded by 6% and post-retirement death benefits are loaded by 1% to estimate the impact of benefits provided to non-spouse beneficiaries (children, parents, siblings).

Administrative Expenses

Total administrative expenses for the fiscal year are equal to the average of the administrative expenses for the prior two fiscal years, increased by 2.50% annually for inflation.

Future expenses are assumed to increase by the general inflation assumption and are adjusted for headcount.

Changes in Methods/Assumptions Since Prior Valuation

Pursuant to the 2020 *Actuarial Methods Recommendations Report*, the WV MPOB adopted changes to the following methods:

- Amortization method: for the Standard and Optional funding policies, the method was changed from a single, closed amortization base to a layered amortization approach.
- Asset method: the method was changed from the market value of assets to a four-year smoothed actuarial value of assets.
- Roll-forward method: for the Standard and Optional funding policies, the method was changed from developing contributions for the valuation year to rolling valuation results forward one year to better align the contribution calculation with the expected timing of the contribution.

Pursuant to the 2020 *Experience Study Report*, the WV MPOB adopted changes to the following assumptions:

- Discount rate development and rates
- Salary increases
- Added a pay spiking assumption
- Inflation (and premium tax increase rate)
- Cost-of-living increases
- Mortality rates (tables and improvement scales)
- Retirement rates (now with separate rates for police officers and firefighters)
- Termination rates (now with separate rates for police officers and firefighters)
- Disability rates
- Marital status
- Load for non-spouse beneficiaries
- Administrative expenses

Section XII. 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.

Supplemental Benefits
Benefits that accumulate after a member's retirement based on an annual COLA increase in the amount of a retired participant's benefit intended to adjust the benefit for inflation.

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.