District of Columbia Retirement Board Teachers' Retirement Plan and Police Officers and Firefighters' Retirement Plan

Actuarial Valuations as of October 1, 2022 to Determine the District's Contribution for the Fiscal Year Ending September 30, 2024

Submitted by:

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December 5, 2022

The Board of Trustees
District of Columbia Retirement Board
900 7th Street, NW, 2nd Floor
Washington, DC 20001

Re: *District of Columbia Teachers' Retirement Plan and District of Columbia Police Officers
        and Firefighters' Retirement Plan Actuarial Valuations*

Dear Trustees:

The following sets forth the actuarial valuations of the District of Columbia Teachers' Retirement
Plan and the District of Columbia Police Officers and Firefighters' Retirement Plan (collectively
referred to as the Plans) as of October 1, 2022. Section I of the report provides a summary, while
Sections II through VI contain the development of the District's contribution for the 2024 fiscal
year, along with a summary of the census and asset data, plan provisions, assumptions and
actuarial methods. Section VII provides a glossary of many of the terms used in this report. The
appendices of the report provide information on plan funding, solvency, a discussion of risk,
adjustments to the actuarially determined contribution, gain and loss from experience, and
valuation balance sheets for the DCRB Annual Comprehensive Financial Report (ACFR).

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

Respectfully submitted,

Thomas Vicente, FSA, EA   Colin Slovenkay, FSA, EA

Ann M. Sturner, FSA, EA

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Section I. Executive Summary

Background

Bolton Partners, Inc. has prepared the following report that sets forth the actuarial valuation of the District of Columbia Teachers' Retirement Plan (Teachers) and District of Columbia Police Officers and Firefighters' Retirement Plan (Police and Fire), collectively referred to as the Plans, as of October 1, 2022. Unless stated otherwise, the calculations reflected in this report are solely for the District-provided benefit and do not include the Federal portion of the benefit. Some demographic information includes a breakdown of District only, Federal only, and split annuitants.

Actuarially Determined Contributions (ADC)

The actuarially determined contribution (ADC) amount for all Plans decreased as a dollar amount and as a percentage of payroll this year.

($ in Thousands)

Teachers, Police, and Fire		FY2022		FY2023		FY2024
ADC (before §1-907.02(c) adjustment)	$	181,490	$	132,222	$	142,433
Total Payroll		1,104,198		1,136,998		1,138,337
Percent of Total Payroll		16.44%		11.63%		12.51%
ADC (after §1-907.02(c) adjustment)	$	184,025	$	125,343	$	130,107

Teachers		FY2022		FY2023		FY2024
ADC (before §1-907.02(c) adjustment)	$	70,524	$	43,913	$	48,763
Total Payroll		575,288		624,500		636,961
Percent of Total Payroll		12.26%		7.03%		7.66%
ADC (after §1-907.02(c) adjustment)	$	75,060	$	47,835	$	50,224

Police and Fire Combined		FY2022		FY2023		FY2024
ADC (before §1-907.02(c) adjustment)	$	110,966	$	88,309	$	93,670
Total Payroll		528,910		512,498		501,375
Percent of Total Payroll		20.98%		17.23%		18.68%
ADC (after §1-907.02(c) adjustment)	$	108,965	$	77,508	$	79,884

Police		FY2022		FY2023		FY2024
ADC (before §1-907.02(c) adjustment)	$	68,786	$	61,338	$	65,713
Total Payroll		350,779		333,307		325,927
Percent of Total Payroll		19.61%		18.40%		20.16%
ADC (after §1-907.02(c) adjustment)	$	68,035	$	53,909	$	56,190

Fire		FY2022		FY2023		FY2024
ADC (before §1-907.02(c) adjustment)	$	42,180	$	26,971	$	27,957
Total Payroll		178,131		179,191		175,448
Percent of Total Payroll		23.68%		15.05%		15.93%
ADC (after §1-907.02(c) adjustment)	$	40,931	$	23,599	$	23,693

Section I. Executive Summary

The tables below compare the actuarial accrued liabilities of the plans and the assets of the plans for the current and prior valuation dates. In addition the liabilities are compared to the assets to determine the funded ratios of the plans.

Funding Measures – Teachers

Teachers		10/1/2021		10/1/2022	Percent Change
1. Actuarial Accrued Liability					
a. Active	$	1,362,322	$	1,396,967	2.54%
b. Retirees and Beneficiaries		1,132,341		1,235,162	9.08%
c. Inactive with Deferred Benefits		203,955		239,440	17.40%
d. Total	**$**	**2,698,618**	**$**	**2,871,570**	**6.41%**
2. Actuarial Value of Assets	$	2,684,368	$	2,838,193	5.73%
3. Plan Funded Ratio (2. / 1.d.)		99.47%		98.84%	
4. Market Value of Assets	$	2,934,307	$	2,573,334	(12.30%)
5. Funded Ratio based on Market Value of Assets (4. / 1.d.)		108.73%		89.61%	

($ in Thousands)

Funding Measures – Police and Fire

Police and Fire		10/1/2021		10/1/2022	Percent Change
1. Actuarial Accrued Liability					
a. Active	$	3,075,255	$	2,932,991	(4.63%)
b. Retirees and Beneficiaries		3,021,846		3,608,693	19.42%
c. Inactive with Deferred Benefits		84,513		97,440	15.30%
d. Total	**$**	**6,181,614**	**$**	**6,639,124**	**7.40%**
2. Actuarial Value of Assets	$	7,290,173	$	7,612,268	4.42%
3. Plan Funded Ratio (2. / 1.d.)		117.93%		114.66%	
4. Market Value of Assets	$	7,963,277	$	6,901,545	(13.33%)
5. Funded Ratio based on Market Value of Assets (4. / 1.d.)		128.82%		103.95%	

($ in Thousands)

Funding Measures – Police

Police		10/1/2021	10/1/2022	Percent Change
1.	Actuarial Accrued Liability			
a.	Active	$ 1,993,751	$ 1,911,590	(4.12%)
b.	Retirees and Beneficiaries	2,272,411	2,663,456	17.21%
c.	Inactive with Deferred Benefits	66,095	71,879	8.75%
d.	**Total**	**$ 4,332,257**	**$ 4,646,924**	**7.26%**
2.	Actuarial Value of Assets	$ 5,015,377	$ 5,220,802	4.10%
3.	Plan Funded Ratio (2. / 1.d.)	115.77%	112.35%	
4.	Market Value of Assets	$ 5,478,977	$ 4,733,562	(13.61%)
5.	Funded Ratio based on Market Value of Assets (4. / 1.d.)	126.47%	101.86%	

($ in Thousands)

Funding Measures – Fire

Fire		10/1/2021	10/1/2022	Percent Change
1.	Actuarial Accrued Liability			
a.	Active	$ 1,081,504	$ 1,021,401	(5.56%)
b.	Retirees and Beneficiaries	749,435	945,238	26.13%
c.	Inactive with Deferred Benefits	18,418	25,561	38.78%
d.	**Total**	**$ 1,849,357**	**$ 1,992,199**	**7.72%**
2.	Actuarial Value of Assets	$ 2,274,795	$ 2,391,466	5.13%
3.	Plan Funded Ratio (2. / 1.d.)	123.00%	120.04%	
4.	Market Value of Assets	$ 2,484,300	$ 2,167,983	(12.73%)
5.	Funded Ratio based on Market Value of Assets (4. / 1.d.)	134.33%	108.82%	

($ in Thousands)

Risk Measures

Actuarial Standard of Practice No. 51 concerning pension plan risk is now in effect. Appendix 3 contains important information about various risks common to most public pension plans. Because the information is too lengthy to include in this summary, we strongly recommend reviewing the Appendix and considering whether further risk assessments are necessary.

Generally, the risk that a plan sponsor incurs from a defined benefit plan is primarily the risk of substantial increases in annual contributions. These increases occur most frequently due to variation in the investment returns. This valuation reflects the smoothing of asset returns, which reduces the risk of wide year-by-year contribution changes but does not ultimately reduce the risk inherent in a defined benefit plan. The following table shows four commonly used measures of the relative riskiness of a pension plan that are related to the plan sponsor and the employee group covered by the plan.

Teachers Risk Measure	10/1/2020	10/1/2021	10/1/2022	Conservative Measures
Retiree Liability as a Percent of Total Liability	42%	42%	43%	<50%
Assets to Payroll (Asset Volatility Ratio)	4.4	4.9	4.2	<5
Liabilities to Payroll (Liability Volatility Ratio)	4.8	4.5	4.7	<5
Benefit Payments to Contributions	0.9	0.8	0.8	<3

Police and Fire Risk Measure	10/1/2020	10/1/2021	10/1/2022	Conservative Measures
Retiree Liability as a Percent of Total Liability	47%	49%	54%	<50%
Assets to Payroll (Asset Volatility Ratio)	13.0	16.2	14.3	<5
Liabilities to Payroll (Liability Volatility Ratio)	11.9	12.5	13.8	<5
Benefit Payments to Contributions	1.1	1.1	1.2	<3

Experience Analysis

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

- Investment returns during FY2022 were about $573.1 million lower than expected for Teachers and $1,540.4 million lower than expected for Police and Fire. A portion of that loss is reflected in this valuation, with the remaining portions to be reflected in future valuations. The loss was offset by the continued recognition of prior investment gains and losses. There is a total of $264.9 million in net deferred investment losses for Teachers and $710.7 million in net deferred investments losses for Police and Fire as of October 1, 2022 that will be reflected in future valuations. These deferrals produce an overall experience loss on investment income.
- Retiree COLAs in FY2022 were more than the assumed annual increases.
- The average participant pay increased/decreased by 1.4% for Teachers, 0.3% for Police, and (0.8%) for Fire.
- Total participant payroll amount changed by 2.0% for Teachers and (2.2%) for Police and Fire over the prior year; the assumption is 4.0% growth per year.

Changes in Method, Assumptions, and Plan Amendments

The Post-Retirement Cost of Living Adjustment (COLA) assumption was changed from 3.0% per year for all members to 3.25% per year for members hired prior to November 10, 1996 and 2.75% per year for members hired on or after November 10, 1996.

The mortality improvement assumption was updated from MP-2020 to MP-2021. This assumption is updated annually to reflect the most recent improvements in mortality.

There were no plan provision changes, other than an update to the child survivor benefits which are annually adjusted for inflation. Method and assumption changes are further explained in Section VI.

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 not possible to estimate at this time, we have made no adjustments to any of the assumptions.

Sources of Information

Membership data as of July 1, 2022, and market value of assets as of October 1, 2022 were provided by or at the direction of the District of Columbia Retirement Board. While we have reviewed this data for consistency and completeness, we have not audited this data. For valuation purposes, members were treated as remaining in the Plans as of October 1, 2022.

Section II. Actuarial Certification

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the District of Columbia Teachers' Retirement Plan and the District of Columbia Police Officers and Firefighters' Retirement Plan, together with a comparison of these liabilities with the value of the plan assets, as submitted by the District of Columbia Retirement Board (the Board). These calculations, and comparisons with assets, are applicable for the valuation date only. The future is uncertain, and the Plans may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the Plans will be able to provide the promised benefits in the future.

This report was prepared for the internal use of the Board and its auditors in connection with our actuarial valuations of the pension plan. The purpose of this report is to provide the recommended employer contribution for the 2024 fiscal year. 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.

This report is based on plan provisions, census data, and asset data submitted by the Board. We have relied on this information for purposes of preparing this report. We have not audited the census or asset data provided, however based on our review the data appears to be reasonable and consistent with previously provided information. Unless otherwise noted in our report, we believe the information provided is sufficiently complete and reliable for purposes of the results presented in this report. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The Board is solely responsible for the validity and completeness of this information.

The Board is responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The Board is solely responsible for communicating to Bolton any changes required thereto.

The Board 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.

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. 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. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.

Different assumptions or scenarios within the range of possibilities may also be reasonable and results based on those assumptions would be different. As a result of the uncertainty inherent in a forward-looking projection over a very long period of time, no one projection is uniquely "correct" and many alternative projections of the future could also be regarded as reasonable. Two different actuaries could, quite reasonably, arrive at different results based on the same data and different views of the future.

The Board could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. That type of analysis would be a separate assignment.

In addition, decisions regarding benefit improvements, benefit changes, the trust'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 Board. 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. 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 are not responsible for the consequences of any decision by the Board to make contributions at a future time rather than an earlier time. The Board is responsible for funding the cost of the plan.

The report is conditioned on the assumption of an ongoing plan 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 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.

The calculations in this report 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.

We make every effort to ensure that our calculations are accurately performed. 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.

Bolton does not practice law and, therefore, cannot and does not provide legal advice. Any statutory interpretation on which this report is based reflects Bolton's understanding as an actuarial firm. Bolton recommends that recipients of this report consult with legal counsel when making any decisions regarding compliance with ERISA, the Internal Revenue Code, or any other statute or regulation.

The Board should notify Bolton promptly after receipt of this report if the Board 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 herein. The report will be deemed final and acceptable to the Board unless the Board 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 to provide explanations or further details as appropriate.

Thomas Vicente, FSA, EA

Ann M. Sturner, FSA, EA

Colin Slovenkay, FSA, EA

Section III. Determination of District Contributions

Derivation of Liabilities – Teachers

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the Plan.

	Teachers		10/1/2021		10/1/2022
1.	Participants				
	a. Active		6,050		6,088
	b. Retirees and Beneficiaries		4,072		4,065
	i. Service Retirements		3,775		3,762
	ii. Disability Retirements		107		102
	iii. Survivors		190		201
	c. Inactive with Deferred Benefits		1,514		1,718
	d. Total		**11,636**		**11,871**
2.	Active Payroll	$	600,481	$	612,463
3.	Actuarial Accrued Liability				
	a. Active Participants	$	1,362,322	$	1,396,967
	b. Retirees and Beneficiaries		1,132,341		1,235,162
	i. Service Retirements		1,078,876		1,178,659
	ii. Disability Retirements		33,557		34,459
	iii. Survivors		19,909		22,044
	c. Inactive with Deferred Benefits		203,955		239,440
	d. Total		**2,698,618**		**2,871,570**
4.	Actuarial Value of Assets	$	2,684,368	$	2,838,193
5.	Unfunded Actuarial Liability (3.d.- 4.)		14,250		33,376
6.	Funded Ratio (4. ÷ 3.d.)		99.47%		98.84%

($ in Thousands)

Derivation of Liabilities – Police and Fire

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the Plan.

Police and Fire		10/1/2021		10/1/2022
1. Participants				
a. Active		5,242		5,133
b. Retirees and Beneficiaries		4,115		4,373
i. Service Retirements		3,119		3,331
ii. Disability Retirements		430		436
iii. Survivors		566		606
c. Inactive with Deferred Benefits		342		356
d. Total		**9,699**		**9,862**
2. Active Payroll	$	492,787	$	482,092
3. Actuarial Accrued Liability				
a. Active Participants	$	3,075,255	$	2,932,991
b. Retirees and Beneficiaries		3,021,846		3,608,693
i. Service Retirements		2,589,147		3,140,881
ii. Disability Retirements		247,985		263,258
iii. Survivors		184,714		204,554
c. Inactive with Deferred Benefits		84,513		97,440
d. Total		**6,181,614**		**6,639,124**
4. Actuarial Value of Assets	$	7,290,173	$	7,612,268
5. Unfunded Actuarial Liability (3.d.- 4.)		(1,108,559)		(973,145)
6. Funded Ratio (4. ÷ 3.d.)		117.93%		114.66%

($ in Thousands)

Derivation of Liabilities – Police

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the Plan.

Police			10/1/2021	10/1/2022
1.	Participants			
	a.	Active	3,366	3,282
	b.	Retirees and Beneficiaries	3,095	3,251
		i. Service Retirements	2,348	2,478
		ii. Disability Retirements	332	335
		iii. Survivors	415	438
	c.	Inactive with Deferred Benefits	252	258
d.	**Total**		**6,713**	**6,791**
2.	Active Payroll		$ 320,487	$ 313,391
3.	Actuarial Accrued Liability			
	a.	Active Participants	$ 1,993,751	$ 1,911,590
	b.	Retirees and Beneficiaries	2,272,411	2,663,456
		i. Service Retirements	1,958,280	2,326,257
		ii. Disability Retirements	190,161	201,655
		iii. Survivors	123,970	135,544
	c.	Inactive with Deferred Benefits	66,095	71,879
	d.	**Total**	**4,332,257**	**4,646,924**
4.	Actuarial Value of Assets		$ 5,015,377	$ 5,220,802
5.	Unfunded Actuarial Liability (3.d.- 4.)		(683,120)	(573,878)
6.	Funded Ratio (4. ÷ 3.d.)		115.77%	112.35%

($ in Thousands)

Derivation of Liabilities – Fire

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the Plan.

Fire		10/1/2021		10/1/2022
1. Participants				
a. Active		1,876		1,851
b. Retirees and Beneficiaries		1,020		1,122
i. Service Retirements		771		853
ii. Disability Retirements		98		101
iii. Survivors		151		168
c. Inactive with Deferred Benefits		90		98
d. Total		**2,986**		**3,071**
2. Active Payroll	$	172,299	$	168,700
3. Actuarial Accrued Liability				
a. Active Participants	$	1,081,504	$	1,021,401
b. Retirees and Beneficiaries		749,435		945,238
i. Service Retirements		630,867		814,624
ii. Disability Retirements		57,824		61,604
iii. Survivors		60,744		69,010
c. Inactive with Deferred Benefits		18,418		25,561
d. Total		**1,849,357**		**1,992,199**
4. Actuarial Value of Assets	$	2,274,795	$	2,391,466
5. Unfunded Actuarial Liability (3.d.- 4.)		(425,438)		(399,267)
6. Funded Ratio (4. ÷ 3.d.)		123.00%		120.04%

($ in Thousands)

Experience Gain/(Loss) and Projection of Unfunded Liability – Teachers

The experience gain/(loss) from October 1, 2021 to October 1, 2022 and projection of the unfunded actuarial liability from October 1, 2022 to October 1, 2023, the beginning of the fiscal year, is shown below. Please see Appendix 5 for a detailed breakdown of gain/(loss) sources.

Experience Gain/(Loss) - Teachers		10/1/2022
1.	Unfunded Liability as of 10/01/2021	$ 14,250
2.	Total FY2022 Normal Cost	83,451
3.	Actual FY2022 Expenses	4,416
4.	Total FY2022 Actual Contributions	121,974
5.	Interest	2,488
6.	Expected Unfunded Liability as of 10/01/2022	(17,369)
7.	Change due to Plan Amendments	0
8.	Change due to Assumptions and/or Methods	(10,364)
9.	Expected Unfunded Liability as of 10/01/2022	(27,733)
10.	Actual Unfunded Liability as of 10/01/2022	33,376
11.	Gain/(Loss)	(61,109)
12.	Actuarial Accrued Liability at 10/01/2021	$ 2,698,618
13.	Gain/(Loss) as a percent of Actuarial Accrued Liability	(2.26%)

Projected Unfunded Liability - Teachers		
1.	Actual Unfunded Liability as of 10/01/2022	$ 33,376
2.	Total Normal Cost FY2023	85,056
3.	Expected District and Employee Contributions FY2023	96,076
4.	Expected Expenses FY2023	7,328
5.	Interest	4,671
6.	Projected Unfunded Liability as of 10/1/2023	$ 34,356

($ in Thousands)

Experience Gain/(Loss) and Projection of Unfunded Liability – Police

The experience gain/(loss) from October 1, 2021 to October 1, 2022 and projection of the unfunded actuarial liability from October 1, 2022 to October 1, 2023, the beginning of the fiscal year, is shown below. Please see Appendix 5 for a detailed breakdown of gain/(loss) sources.

Experience Gain/(Loss) - Police		10/1/2022
1.	Unfunded Liability as of 10/01/2021	$ (683,120)
2.	Total FY2022 Normal Cost	125,010
3.	Actual FY2022 Expenses	8,130
4.	Total FY2022 Actual Contributions	92,219
5.	Interest	(37,470)
6.	Expected Unfunded Liability as of 10/01/2022	(679,669)
7.	Change due to Plan Amendments	0
8.	Change due to Assumptions and/or Methods	14,941
9.	Expected Unfunded Liability as of 10/01/2022	(664,727)
10.	Actual Unfunded Liability as of 10/01/2022	(573,878)
11.	Gain/(Loss)	(90,850)
12.	Actuarial Accrued Liability at 10/01/2021	$ 4,332,257
13.	Gain/(Loss) as a percent of Actuarial Accrued Liability	(2.10%)

Projected Unfunded Liability - Police		
1.	Actual Unfunded Liability as of 10/01/2022	$ (573,878)
2.	Total Normal Cost FY2023	120,079
3.	Expected District and Employee Contributions FY2023	78,738
4.	Expected Expenses FY2023	6,600
5.	Interest	(30,583)
6.	Projected Unfunded Liability as of 10/1/2023	$ (556,520)

($ in Thousands)

Experience Gain/(Loss) and Projection of Unfunded Liability – Fire

The experience gain/(loss) from October 1, 2021 to October 1, 2022 and projection of the unfunded actuarial liability from October 1, 2022 to October 1, 2023, the beginning of the fiscal year, is shown below. Please see Appendix 5 for a detailed breakdown of gain/(loss) sources.

Experience Gain/(Loss) - Fire		10/1/2022
1.	Unfunded Liability as of 10/01/2021	$ (425,438)
2.	Total FY2022 Normal Cost	66,123
3.	Actual FY2022 Expenses	3,723
4.	Total FY2022 Actual Contributions	53,743
5.	Interest	(23,997)
6.	Expected Unfunded Liability as of 10/01/2022	(433,331)
7.	Change due to Plan Amendments	0
8.	Change due to Assumptions and/or Methods	1,277
9.	Expected Unfunded Liability as of 10/01/2022	(432,054)
10.	Actual Unfunded Liability as of 10/01/2022	(399,267)
11.	Gain/(Loss)	(32,787)
12.	Actuarial Accrued Liability at 10/01/2021	$ 1,849,357
13.	Gain/(Loss) as a percent of Actuarial Accrued Liability	(1.77%)

Projected Unfunded Liability - Fire		
1.	Actual Unfunded Liability as of 10/01/2022	$ (399,267)
2.	Total Normal Cost FY2023	63,846
3.	Expected District and Employee Contributions FY2023	36,755
4.	Expected Expenses FY2023	3,497
5.	Interest	(21,987)
6.	Projected Unfunded Liability as of 10/1/2023	$ (390,666)

($ in Thousands)

Development of District Contributions – Teachers

The breakdown of the Actuarially Determined Contribution into normal cost, amortization payment, expected administrative expenses, and D.C. Code §1-907.02(c) Adjustment is illustrated below. The calculation of the D.C. Code §1-907.02(c) Adjustment is detailed in Appendix 4.

Teachers Actuarially Determined Contribution (ADC)		FY2024	Percentage of FY2024 Payroll
1. Total Normal Cost as of October 1, 2022	$	85,056	N/A
2. Projected Total Normal Cost as of October 1, 2023 (1. x 1.04)		88,474	13.89%
3. Expected Member Contributions		50,320	7.90%
4. Employer Normal Cost (2. - 3.)		38,154	5.99%
5. Expenses		7,644	1.20%
6. Amortization Payment		2,965	0.47%
7. Actuarially Determined Contribution (ADC) (4. + 5. + 6.)		48,763	7.66%
8. D.C. Code §1-907.02(c) Adjustment to FY2024 Payment		1,461	N/A
9. Fiscal Year District Payment	$	50,224	N/A

Projected Payroll		
1. Active Member June 30, 2022 Payroll	$	578,701
2. Expected FY2023 Payroll (1. increased with one year of salary scale)		612,463
3. Projected FY2024 Payroll (2. x 1.04)	$	636,961

($ in Thousands)

Development of District Contributions – Police and Fire

The breakdown of the Actuarially Determined Contribution into normal cost, amortization payment, expected administrative expenses, and D.C. Code §1-907.02(c) Adjustment is illustrated below. The calculation of the D.C. Code §1-907.02(c) Adjustment is detailed in Appendix 4.

Police and Fire Actuarially Determined Contribution (ADC)		FY2024	Percentage of FY2024 Payroll
1. Total Normal Cost as of October 1, 2022	$	183,924	N/A
2. Projected Total Normal Cost as of October 1, 2023 (1. x 1.04)		191,302	38.15%
3. Expected Member Contributions		39,608	7.90%
4. Employer Normal Cost (2. - 3.)		151,694	30.25%
5. Expenses		10,528	2.10%
6. Amortization Payment		(68,553)	(13.67%)
7. Actuarially Determined Contribution (ADC) (4. + 5. + 6.)		93,670	18.68%
8. D.C. Code §1-907.02(c) Adjustment to FY2024 Payment		(13,786)	N/A
9. Fiscal Year District Payment	$	79,884	N/A

Projected Payroll		
1. Active Member June 30, 2022 Payroll	$	453,584
2. Expected FY2023 Payroll (1. increased with one year of salary scale)		482,092
3. Projected FY2024 Payroll (2. x 1.04)	$	501,375

($ in Thousands)

Development of District Contributions – Police

The breakdown of the Actuarially Determined Contribution into normal cost, amortization payment, expected administrative expenses, and D.C. Code §1-907.02(c) Adjustment is illustrated below. The calculation of the D.C. Code §1-907.02(c) Adjustment is detailed in Appendix 4.

Police Actuarially Determined Contribution (ADC)		FY2024	Percentage of FY2024 Payroll
1. Total Normal Cost as of October 1, 2022	$	120,079	N/A
2. Projected Total Normal Cost as of October 1, 2023 (1. x 1.04)		124,895	38.32%
3. Expected Member Contributions		25,748	7.90%
4. Employer Normal Cost (2. - 3.)		99,147	30.42%
5. Expenses		6,844	2.10%
6. Amortization Payment		(40,278)	(12.36%)
7. Actuarially Determined Contribution (ADC) (4. + 5. + 6.)		65,713	20.16%
8. D.C. Code §1-907.02(c) Adjustment to FY2024 Payment		(9,523)	N/A
9. Fiscal Year District Payment	$	56,190	N/A

Projected Payroll		
1. Active Member June 30, 2022 Payroll	$	293,999
2. Expected FY2023 Payroll (1. increased with one year of salary scale)		313,391
3. Projected FY2024 Payroll (2. x 1.04)	$	325,927

($ in Thousands)

Development of District Contributions – Fire

The breakdown of the Actuarially Determined Contribution into normal cost, amortization payment, expected administrative expenses, and D.C. Code §1-907.02(c) Adjustment is illustrated below. The calculation of the D.C. Code §1-907.02(c) Adjustment is detailed in Appendix 4.

Fire Actuarially Determined Contribution (ADC)		FY2024	Percentage of FY2024 Payroll
1. Total Normal Cost as of October 1, 2022	$	63,846	N/A
2. Projected Total Normal Cost as of October 1, 2023 (1. x 1.04)		66,407	37.85%
3. Expected Member Contributions		13,860	7.90%
4. Employer Normal Cost (2. - 3.)		52,547	29.95%
5. Expenses		3,684	2.10%
6. Amortization Payment		(28,275)	(16.12%)
7. Actuarially Determined Contribution (ADC) (4. + 5. + 6.)		27,957	15.93%
8. D.C. Code §1-907.02(c) Adjustment to FY2024 Payment		(4,264)	N/A
9. Fiscal Year District Payment	$	23,693	N/A

Projected Payroll		
1. Active Member June 30, 2022 Payroll	$	159,586
2. Expected FY2023 Payroll (1. increased with one year of salary scale)		168,700
3. Projected FY2024 Payroll (2. x 1.04)	$	175,448

($ in Thousands)

Schedule of Amortization Bases

Below is a schedule of the amortization bases as of October 1, 2023.

Teachers Description	Date Established	Remaining Years	Amount to be Amortized	Payment / (Credit)
Actuarial (Gain)/Loss	10/1/2023	20	34,356	2,965
Totals			$ 34,356	$ 2,965

Police Description	Date Established	Remaining Years	Amount to be Amortized	Payment / (Credit)
Surplus	10/1/2023	30	(556,520)	(40,278)
Totals			$ (556,520)	$ (40,278)

Fire Description	Date Established	Remaining Years	Amount to be Amortized	Payment / (Credit)
Surplus	10/1/2023	30	(390,666)	(28,275)
Totals			$ (390,666)	$ (28,275)

($ in Thousands)

Bases are amortized on a level dollar basis.

The unfunded liability at 10/1/2022 is projected to 10/1/2023 for the amortization of the (gain)/loss and surplus.

Section IV. Valuation of Assets

Reconciliation of Assets – Teachers

Below is a reconciliation of assets from October 1, 2020 through September 30, 2022. An adjustment has been included to account for the difference in market value of assets between the prior year's valuation report and the audited value.

Teachers		FY2021		FY2022
1. Beginning of Year Assets	$	2,411,390,000	$	2,934,307,000
2. Adjustments		-		10,577,000
3. Beginning of Year Assets after Adjustments		2,411,390,000		2,944,884,000
4. Receipts				
a. Employer Contributions		70,478,000		75,060,000
b. Employee Contributions		45,689,000		46,914,000
c. Net Investment Income		503,698,000		(388,520,000)
d. Total Receipts	$	619,865,000	$	(266,546,000)
5. Deductions				
a. Benefit Payments	$	(89,404,000)	$	(95,352,000)
b. Refunds		(3,417,000)		(5,236,000)
c. Administrative Expenses		(4,127,000)		(4,416,000)
d. Total Deductions	$	(96,948,000)	$	(105,004,000)
6. Net Increase		522,917,000		(371,550,000)
7. End of Year Assets	$	2,934,307,000	$	2,573,334,000
8. Rate of Return		20.81%		-13.16%

(2 x 4.c.) / (1. + 7. – 4.c.)

Reconciliation of Assets – Police and Fire

Below is a reconciliation of assets from October 1, 2020 through September 30, 2022. An adjustment has been included to account for the difference in market value of assets between the prior year's valuation report and the audited value.

Police and Fire	FY2021	FY2022
1. Beginning of Year Assets	$ 6,620,190,000	$ 7,963,277,000
2. Adjustments	-	28,717,000
3. Beginning of Year Assets after Adjustments	6,620,190,000	7,991,994,000
4. Receipts		
a. Employer Contributions	$ 109,933,000	$ 108,965,000
b. Employee Contributions	37,433,000	36,997,000
c. Net Investment Income	1,365,804,000	(1,042,397,000)
d. Total Receipts	**$ 1,513,170,000**	**$ (896,435,000)**
5. Deductions		
a. Benefit Payments	$ (156,455,000)	$ (179,984,000)
b. Refunds	(2,420,000)	(2,177,000)
c. Administrative Expenses	(11,208,000)	(11,853,000)
d. Total Deductions	**$ (170,083,000)**	**$ (194,014,000)**
6. Net Increase	1,343,087,000	(1,090,449,000)
7. End of Year Assets	$ 7,963,277,000	$ 6,901,545,000
8. Rate of Return	20.67%	-13.08%
(2 x 4.c.) / (1. + 7. – 4.c.)		

Reconciliation of Assets – Police

Below is a reconciliation of assets from October 1, 2020 through September 30, 2022. An adjustment has been included to account for the difference in market value of assets between the prior year's valuation report and the audited value.

Police		FY2021		FY2022
1. Beginning of Year Assets	$	4,576,807,674	$	5,478,977,416
2. Adjustments		-		19,758,172
3. Beginning of Year Assets after Adjustments		4,576,807,674		5,498,735,588
4. Receipts				
a. Employer Contributions	$	61,796,000	$	68,034,000
b. Employee Contributions		24,410,059		24,184,939
c. Net Investment Income		941,767,242		(716,157,306)
d. Total Receipts	**$**	**1,027,973,301**	**$**	**(623,938,367)**
5. Deductions				
a. Benefit Payments	$	(116,293,002)	$	(131,514,309)
b. Refunds		(1,798,786)		(1,590,734)
c. Administrative Expenses		(7,711,772)		(8,129,743)
d. Total Deductions	**$**	**(125,803,560)**	**$**	**(141,234,786)**
6. Net Increase		902,169,741		(765,173,153)
7. End of Year Assets	$	5,478,977,416	$	4,733,562,435
8. Rate of Return		20.67%		-13.08%
(2 x 4.c.) / (1. + 7. – 4.c.)				

Reconciliation of Assets – Fire

Below is a reconciliation of assets from October 1, 2020 through September 30, 2022. An adjustment has been included to account for the difference in market value of assets between the prior year's valuation report and the audited value.

Fire	FY2021	FY2022
1. Beginning of Year Assets	$ 2,043,382,326	$ 2,484,299,584
2. Adjustments	-	8,958,828
3. Beginning of Year Assets after Adjustments	2,043,382,326	2,493,258,412
4. Receipts		
a. Employer Contributions	$ 48,137,000	$ 40,931,000
b. Employee Contributions	13,022,941	12,812,061
c. Net Investment Income	424,036,758	(326,239,694)
d. Total Receipts	$ 485,196,699	$ (272,496,633)
5. Deductions		
a. Benefit Payments	$ (40,161,999)	$ (48,469,691)
b. Refunds	(621,214)	(586,266)
c. Administrative Expenses	(3,496,228)	(3,723,257)
d. Total Deductions	$ (44,279,441)	$ (52,779,214)
6. Net Increase	440,917,258	(325,275,847)
7. End of Year Assets	$ 2,484,299,584	$ 2,167,982,565
8. Rate of Return	20.67%	-13.08%
(2 x 4.c.) / (1. + 7. – 4.c.)		

Calculation of Actuarial Asset Value – Teachers

The actuarial asset value as of October 1, 2022 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

Teachers	10/1/2022
1. Market Value of Assets at End of Year	$ 2,573,334,000
2. Net investment income	(388,520,000)
3. Expected Return Rate as of 09/30/2022	6.25%
4. Expected investment income	184,585,563
5. Gain/(Loss)	(573,105,563)

Spreading of investment gain/(loss)

Year	Original or restructured base	% Deferred	Deferred
FY2022	$ (573,105,563)	80%	$ (458,484,450)
FY2021	346,333,033	60%	207,799,820
FY2020	(7,610,383)	40%	(3,044,153)
FY2019	(55,652,385)	20%	(11,130,477)
FY2018	(1,502,690)	0%	-
		Total deferred	(264,859,260)

6. Preliminary Actuarial Value of Assets	$	2,838,193,260
7. Lower Corridor		2,058,667,200
8. Upper Corridor		3,088,000,800
9. Final Actuarial Value of Assets		2,838,193,260
Rate of Return		5.08%

Calculation of Actuarial Asset Value – Police and Fire

The actuarial asset value as of October 1, 2022 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

Police and Fire	10/1/2022
1. Market Value of Assets at End of Year	$ 6,901,545,000
2. Net investment income	(1,042,397,000)
3. Expected Return Rate as of 09/30/2022	6.25%
4. Expected investment income	497,998,000
5. Gain/(Loss)	(1,540,395,000)

Spreading of investment gain/(loss)

Year	Original or restructured base	% Deferred	Deferred
FY2022	$ (1,540,395,000)	80%	$ (1,232,316,000)
FY2021	936,229,953	60%	561,737,972
FY2020	(22,287,348)	40%	(8,914,939)
FY2019	(156,151,165)	20%	(31,230,233)
FY2018	(234,205)	0%	-
		Total deferred	**(710,723,200)**

6. Preliminary Actuarial Value of Assets	$	7,612,268,200
7. Lower Corridor		5,521,236,000
8. Upper Corridor		8,281,854,000
9. Final Actuarial Value of Assets		7,612,268,200

Rate of Return	5.09%

Calculation of Actuarial Asset Value – Police

The actuarial asset value as of October 1, 2022 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

Police	10/1/2022
1. Market Value of Assets at End of Year	$ 4,733,562,435
2. Net investment income	(716,157,306)
3. Expected Return Rate as of 09/30/2022	6.25%
4. Expected investment income	342,139,229
5. Gain/(Loss)	(1,058,296,535)

Spreading of investment gain/(loss)

Year	Original or restructured base	% Deferred	Deferred
FY2022	$ (1,058,296,535)	80%	$ (846,637,228)
FY2021	645,561,662	60%	387,336,997
FY2020	(15,451,823)	40%	(6,180,729)
FY2019	(108,792,993)	20%	(21,758,599)
FY2018	(304,943)	0%	-
		Total deferred	(487,239,559)

6. Preliminary Actuarial Value of Assets	$	5,220,801,994
7. Lower Corridor		3,786,849,948
8. Upper Corridor		5,680,274,922
9. Final Actuarial Value of Assets		5,220,801,994

Rate of Return	5.10%

Calculation of Actuarial Asset Value – Fire

The actuarial asset value as of October 1, 2022 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

Fire		10/1/2022
1. Market Value of Assets at End of Year	$	2,167,982,565
2. Net investment income		(326,239,694)
3. Expected Return Rate as of 09/30/2022		6.25%
4. Expected investment income		155,858,771
5. Gain/(Loss)		(482,098,465)

Spreading of investment gain/(loss)

Year	Original or restructured base	% Deferred	Deferred
FY2022	$ (482,098,465)	80%	$ (385,678,772)
FY2021	290,668,291	60%	174,400,975
FY2020	(6,835,525)	40%	(2,734,210)
FY2019	(47,358,172)	20%	(9,471,634)
FY2018	70,738	0%	-
		Total deferred	**(223,483,641)**

6. Preliminary Actuarial Value of Assets		$	2,391,466,206
7. Lower Corridor			1,734,386,052
8. Upper Corridor			2,601,579,078
9. Final Actuarial Value of Assets			2,391,466,206
Rate of Return			5.09%

Section V. Participant Information

Participant Summary

The following table summarizes the counts, ages and benefit information for Plan participants used in this valuation.

	Teachers	Police Officers	Firefighters	Total
1. Active				
a. Number	6,088	3,282	1,851	11,221
b. Average Age	41.5	39.9	39.6	40.7
c. Average Service	8.6	12.6	13.3	10.6
d. Average Salary	$ 100,602	$ 95,488	$ 91,140	$ 97,545
2. Vested Terminations				
a. Number	1,718	258	98	2,074
b. Average Age	49.2	44.2	44.5	48.4
c. Total Annual Benefits	$ 25,118,757	$ 5,222,454	$ 1,905,622	$ 32,246,833
3. Service Retired, Disabled and Beneficiaries (Receiving District Benefits)				
a. Number	4,065	3,251	1,122	8,438
b. Average Age	74.6	60.9	62.1	67.6
c. Total Annual Benefits	$ 96,685,997	$ 138,876,236	$ 51,278,826	$ 286,841,059

The following table summarizes all retiree member data and is provided for informational purposes only. The benefits are the total benefits for all members who were employed by the District and include both those that are the District's responsibility and those that are the responsibility of the U.S. Department of the Treasury. The liabilities for benefits that are the responsibility of the U.S. Department of the Treasury are not included in this actuarial valuation.

	Teachers	Police Officers	Firefighters	Total
Service Retired, Disabled and Beneficiaries (Receiving District and/or Federal Benefits)				
a. Number	5,472	6,506	2,102	14,080
b. Average Age	77.6	69.3	70.8	72.8
c. Total Annual Benefits	$ 283,244,232	$ 401,093,248	$ 145,232,990	$ 829,570,469

Active Age/Service Distribution Including Compensation – Teachers

Shown below is the distribution of active participants based on age and service. The compensation shown is the average of estimated FY2023 pay (pay rate provided as of June 30, 2022 increased with salary scale for one year).

| Age | Years of Service as of 10/01/2022 | | | | | | | | | | |
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	Total
Under 25	6	89	0	0	0	0	0	0	0	0	95
	59,899	61,068	0	0	0	0	0	0	0	0	60,995
25 - 29	24	494	112	2	0	0	0	0	0	0	632
	67,108	69,635	80,389	69,878	0	0	0	0	0	0	71,446
30 - 34	27	510	484	122	1	0	0	0	0	0	1,144
	74,514	83,346	95,348	104,933	112,459	0	0	0	0	0	90,543
35 - 39	19	350	494	264	52	1	0	0	0	0	1,180
	82,886	92,584	105,136	111,027	110,111	92,424	0	0	0	0	102,581
40 - 44	16	261	346	225	122	25	0	0	0	0	995
	79,503	95,747	112,158	115,820	116,402	127,122	0	0	0	0	109,052
45 - 49	9	137	237	169	90	105	12	0	0	0	759
	88,367	97,351	111,826	117,209	117,823	120,235	122,163	0	0	0	112,171
50 - 54	7	97	141	97	61	107	62	14	0	0	586
	90,574	95,298	108,727	113,814	112,381	119,704	118,640	132,683	0	0	111,135
55 - 59	6	58	70	59	36	39	36	30	5	0	339
	95,967	93,836	112,036	114,682	115,703	118,086	118,963	121,812	119,769	0	111,898
60 - 64	3	25	23	26	35	33	25	15	17	1	203
	71,074	100,651	108,868	104,215	113,091	117,455	110,902	120,638	122,388	121,064	111,138
65 - 69	0	15	20	15	11	13	11	12	14	5	116
	0	92,545	109,111	115,910	122,956	113,852	123,900	122,984	120,605	112,833	114,078
70 & Up	1	7	3	3	3	5	4	7	4	2	39
	95,632	93,083	105,631	107,044	106,390	113,208	115,655	134,853	117,631	121,065	112,556
Totals	**118**	**2,043**	**1,930**	**982**	**411**	**328**	**150**	**78**	**40**	**8**	**6,088**
	77,480	**84,344**	**103,925**	**112,725**	**115,070**	**119,607**	**118,016**	**124,888**	**120,961**	**115,920**	**100,602**

Averages	
Age	41.5
Service	8.6

Active Age/Service Distribution Including Compensation – Police

Shown below is the distribution of active participants based on age and service. The compensation shown is the average of estimated FY2023 pay (pay rate provided as of June 30, 2022 increased with salary scale for one year).

Age	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	Total
Under 25	26	85	5	0	0	0	0	0	0	0	116
	65,557	70,377	72,185	0	0	0	0	0	0	0	69,375
25 - 29	58	288	129	3	0	0	0	0	0	0	478
	65,557	75,889	80,174	84,682	0	0	0	0	0	0	75,847
30 - 34	20	157	326	47	5	0	0	0	0	0	555
	65,557	76,176	84,205	90,383	91,267	0	0	0	0	0	81,849
35 - 39	11	71	174	212	111	0	0	0	0	0	579
	65,557	76,114	84,634	95,073	102,514	0	0	0	0	0	90,477
40 - 44	1	20	62	94	270	56	0	0	0	0	503
	65,557	75,887	86,256	95,221	107,172	121,235	0	0	0	0	102,599
45 - 49	3	13	23	33	131	213	70	0	0	0	486
	65,557	77,213	84,385	96,296	105,405	120,781	125,640	0	0	0	112,445
50 - 54	3	5	9	23	86	152	65	21	0	0	364
	65,557	77,482	91,434	101,105	104,646	118,652	128,215	128,410	0	0	114,828
55 - 59	2	2	4	7	31	65	15	33	1	0	160
	65,557	87,315	83,377	91,351	106,478	115,293	126,311	132,654	141,630	0	115,547
60 - 64	0	1	1	4	5	17	3	5	4	1	41
	0	77,149	111,821	97,828	99,908	113,721	139,299	122,623	143,455	118,488	115,522
65 - 69	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
70 & Up	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
Totals	**124**	**642**	**733**	**423**	**639**	**503**	**153**	**59**	**5**	**1**	**3,282**
	65,557	**75,331**	**83,817**	**94,899**	**105,446**	**119,240**	**127,067**	**130,293**	**143,090**	**118,488**	**95,488**

Years of Service as of 10/01/2022

Averages	
Age	39.9
Service	12.6

Active Age/Service Distribution Including Compensation – Fire

Shown below is the distribution of active participants based on age and service. The compensation shown is the average of estimated FY2023 pay (pay rate provided as of June 30, 2022 increased with salary scale for one year).

Age	\ \ \ \ \ \ \ \ \ Years of Service as of 10/01/2022										Total
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40 & Up	
Under 25	11	61	2	0	0	0	0	0	0	0	74
	61,224	62,164	64,197	0	0	0	0	0	0	0	62,079
25 - 29	29	120	108	12	0	0	0	0	0	0	269
	60,159	66,538	74,061	77,790	0	0	0	0	0	0	69,373
30 - 34	27	105	104	36	1	0	0	0	0	0	273
	59,992	68,154	75,809	80,482	70,861	0	0	0	0	0	71,899
35 - 39	7	49	67	103	166	3	0	0	0	0	395
	58,057	68,010	78,099	92,279	99,506	93,016	0	0	0	0	89,300
40 - 44	4	16	14	68	166	30	2	0	0	0	300
	60,234	67,845	79,105	93,058	103,111	115,733	131,336	0	0	0	98,710
45 - 49	1	3	4	14	103	80	23	11	0	0	239
	58,057	76,616	74,120	90,181	98,240	119,590	121,666	130,691	0	0	107,819
50 - 54	0	0	4	2	31	96	37	32	0	0	202
	0	0	77,767	90,650	102,363	109,020	122,661	135,284	0	0	113,857
55 - 59	0	0	1	0	5	21	26	15	2	0	70
	0	0	70,035	0	106,596	99,558	120,469	167,530	186,913	0	124,467
60 - 64	0	0	0	0	0	6	8	8	5	0	27
	0	0	0	0	0	94,998	117,865	136,120	128,002	0	120,070
65 - 69	0	0	0	0	0	1	0	1	0	0	2
	0	0	0	0	0	106,022	0	102,135	0	0	104,079
70 & Up	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
Totals	79	354	304	235	472	237	96	67	7	0	1,851
	60,041	66,612	75,753	89,819	100,700	112,029	121,610	141,354	144,834	0	91,140

Averages	
Age	39.6
Service	13.3

Participant Reconciliation – Teachers

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

Teachers	Active Participants	Inactive Participants				Total
		Retirees	Disabled Retirees	Beneficiaries	Vested Terms	
Participants in Last Valuation	6,050	3,775	107	190	1,514	11,636
Death	(1)	(94)	(6)	(7)	0	(108)
Disabled	(1)	0	1	0	0	0
Retired	(75)	85	0	0	(10)	0
Vested Termination	(296)	0	0	0	296	0
Nonvested Termination	(380)	0	0	0	0	(380)
Return of Contributions/Benefits Ended	(113)	(10)	0	(1)	(33)	(157)
New Actives	872	0	0	0	0	872
Rehire from Vested Term	32	0	0	0	(32)	0
Rehire from Nonvested Term	0	0	0	0	0	0
New Beneficiaries	0	0	0	19	0	19
Data Adjustment	0	6	0	0	(17)	(11)
Participants in This Valuation	6,088	3,762	102	201	1,718	11,871

In addition, there are 1,021 participants who are non-vested and due a refund of employee contributions.

Participant Reconciliation – Police

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

Police	Active Participants	Inactive Participants				Total
		Retirees	Disabled Retirees	Beneficiaries	Vested Terms	
Participants in Last Valuation	3,366	2,348	332	415	252	6,713
Death	(6)	(17)	(8)	(7)	0	(38)
Disabled	(11)	0	11	0	0	0
Retired	(124)	142	0	0	(18)	0
Vested Termination	(59)	0	0	0	59	0
Nonvested Termination	(62)	0	0	0	0	(62)
Return of Contributions/Benefits Ended	(32)	0	0	(10)	(21)	(63)
New Actives	202	0	0	0	0	202
Rehire from Vested Term	8	0	0	0	(8)	0
Rehire from Nonvested Term	0	0	0	0	0	0
New Beneficiaries	0	0	0	41	0	41
Data Adjustment	0	5	0	(1)	(6)	(2)
Participants in This Valuation	3,282	2,478	335	438	258	6,791

In addition, there are 147 participants who are non-vested and due a refund of employee contributions.

Participant Reconciliation – Fire

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

Fire	Active Participants	Inactive Participants					Total
		Retirees	**Disabled Retirees**	**Beneficiaries**	**Vested Terms**		
Participants in Last Valuation	1,876	771	98	151	90	2,986
Death	(2)	(8)	0	0	0	(10)
Disabled	(3)	0	3	0	0	0
Retired	(87)	91	0	0	(4)	0
Vested Termination	(20)	0	0	0	20	0
Nonvested Termination	(30)	0	0	0	0	(30)
Return of Contributions/Benefits Ended	(7)	(1)	0	(2)	(7)	(17)
New Actives	124	0	0	0	0	124
Rehire from Vested Term	0	0	0	0	0	0
Rehire from Nonvested Term	0	0	0	0	0	0
New Beneficiaries	0	0	0	19	0	19
Data Adjustment	0	0	0	0	(1)	(1)
Participants in This Valuation	1,851	853	101	168	98	3,071

In addition, there are 66 participants who are non-vested and due a refund of employee contributions.

Schedule of Retiree Member Data – Total Counts

The following table summarizes the total number of Service Retired, Disabled, and Beneficiary members included in the retiree member data. Only the retiree members receiving a benefit from the District are included in this valuation.

	(1) Receiving Only District Benefits	(2) Receiving Only Federal Benefits	(3) Receiving Both District and Federal Benefits	(4) = (1) + (3) Total Receiving District Benefits	(5) = (2) + (3) Total Receiving Federal Benefits	(6) = (1) + (2) + (3) Total Receiving Benefits
Teachers	582	1,407	3,483	4,065	4,890	5,472
Police	520	3,255	2,731	3,251	5,986	6,506
Fire	182	980	940	1,122	1,920	2,102
Total	**1,284**	**5,642**	**7,154**	**8,438**	**12,796**	**14,080**

Schedule of Retiree Member Data – Teachers – Receiving District Benefits

Shown below is the schedule of retiree member data. The benefits are only those member benefits that are the District's responsibility.

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20	-	$ -	-	$ -	7	$ 46,911	7	$ 46,911
20 to 24	-	-	-	-	2	15,683	2	15,683
25 to 29	-	-	-	-	-	-	-	-
30 to 34	-	-	-	-	-	-	-	-
35 to 39	-	-	-	-	2	18,744	2	18,744
40 to 44	-	-	-	-	2	39,499	2	39,499
45 to 49	-	-	2	82,992	4	60,627	6	143,619
50 to 54	3	139,887	7	277,548	2	26,118	12	443,553
55 to 59	87	4,354,071	10	420,456	6	121,423	103	4,895,950
60 to 64	340	13,731,562	18	592,296	22	222,511	380	14,546,369
65 to 69	685	22,697,321	15	411,770	34	346,066	734	23,455,157
70 to 74	1,219	28,673,702	41	820,216	50	344,131	1,310	29,838,049
75 to 79	997	16,473,198	8	104,421	41	299,827	1,046	16,877,446
80 to 84	351	5,069,998	1	3,492	18	91,624	370	5,165,113
85 to 89	67	879,343	-	-	9	58,057	76	937,400
90 to 94	11	210,453	-	-	1	2,440	12	212,892
95 and over	2	26,908	-	-	1	22,704	3	49,612
Total	**3,762**	**$ 92,256,441**	**102**	**$ 2,713,190**	**201**	**$ 1,716,366**	**4,065**	**$ 96,685,997**

Schedule of Retiree Member Data – Teachers – Receiving District and/or Federal Benefits

Shown below is the schedule of all retiree member data. The benefits are the total member benefits and include both those that are the District's responsibility and those that are the responsibility of the U.S. Department of the Treasury.

Attained Age	Service Retirement No.	Service Retirement Annual Benefits	Disability Retirement No.	Disability Retirement Annual Benefits	Survivors and Beneficiaries No.	Survivors and Beneficiaries Annual Benefits	Total No.	Total Annual Benefits
Under 20	-	$ -	-	$ -	7	$ 53,520	7	$ 53,520
20 to 24	-	-	-	-	2	16,752	2	16,752
25 to 29	-	-	-	-	-	-	-	-
30 to 34	-	-	-	-	-	-	-	-
35 to 39	-	-	-	-	2	18,744	2	18,744
40 to 44	-	-	-	-	2	48,600	2	48,600
45 to 49	-	-	2	82,992	6	86,508	8	169,500
50 to 54	3	159,792	7	277,548	4	57,540	14	494,880
55 to 59	86	5,580,456	14	501,336	8	163,056	108	6,244,848
60 to 64	342	18,578,160	21	815,952	27	502,764	390	19,896,876
65 to 69	690	37,273,140	18	703,956	39	906,108	747	38,883,204
70 to 74	1,264	69,189,444	65	2,335,812	71	1,480,860	1,400	73,006,116
75 to 79	1,145	63,844,260	37	1,270,764	89	2,068,680	1,271	67,183,704
80 to 84	670	37,366,908	23	802,704	66	1,660,308	759	39,829,920
85 to 89	400	21,542,220	22	755,304	57	1,409,628	479	23,707,152
90 to 94	172	8,875,296	9	303,660	29	745,908	210	9,924,864
95 and over	61	3,271,008	4	202,968	8	291,576	73	3,765,552
Total	**4,833**	**$ 265,680,684**	**222**	**$ 8,052,996**	**417**	**$ 9,510,552**	**5,472**	**$ 283,244,232**

Schedule of Retiree Member Data – Teachers – Receiving Federal Benefits

Shown below is the schedule of retiree member data. The benefits are only those member benefits that are the responsbility of the U.S. Department of the Treasury.

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20	-	$ -	-	$ -	2	$ 6,609	2	$ 6,609
20 to 24	-	-	-	-	1	1,069	1	1,069
25 to 29	-	-	-	-	-	-	-	-
30 to 34	-	-	-	-	-	-	-	-
35 to 39	-	-	-	-	-	-	-	-
40 to 44	-	-	-	-	1	9,101	1	9,101
45 to 49	-	-	-	-	3	25,881	3	25,881
50 to 54	3	19,905	-	-	3	31,422	6	51,327
55 to 59	80	1,277,590	4	85,103	5	41,633	89	1,404,326
60 to 64	255	4,846,598	16	223,656	21	280,253	292	5,350,507
65 to 69	543	14,575,819	14	292,186	33	560,042	590	15,428,047
70 to 74	1,094	40,515,742	61	1,515,596	59	1,136,729	1,214	43,168,067
75 to 79	1,082	47,371,062	37	1,166,343	83	1,768,853	1,202	50,306,258
80 to 84	650	32,296,910	23	799,212	62	1,568,684	735	34,664,807
85 to 89	395	20,662,877	22	755,304	56	1,351,571	473	22,769,752
90 to 94	172	8,664,843	9	303,660	29	743,468	210	9,711,972
95 and over	61	3,244,100	4	202,968	7	268,872	72	3,715,940
Total	**4,335**	**$ 173,475,449**	**190**	**$ 5,344,029**	**365**	**$ 7,794,186**	**4,890**	**$ 186,613,663**

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Schedule of Retiree Member Data – Police – Receiving District Benefits

Shown below is the schedule of retiree member data. The benefits are only those member benefits that are the District's responsibility.

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20	1	$ 9,478	-	$ -	36	$ 333,598	37	$ 343,076
20 to 24	-	-	-	-	2	71,135	2	71,135
25 to 29	-	-	3	108,456	-	-	3	108,456
30 to 34	-	-	5	204,828	-	-	5	204,828
35 to 39	-	-	11	421,752	5	190,110	16	611,862
40 to 44	1	76,524	16	584,808	6	168,637	23	829,969
45 to 49	78	5,648,923	38	1,564,032	30	714,998	146	7,927,952
50 to 54	614	40,186,815	96	3,713,767	57	1,360,043	767	45,260,625
55 to 59	750	41,534,982	73	2,122,053	71	1,445,702	894	45,102,737
60 to 64	466	21,073,115	49	1,391,883	75	1,298,189	590	23,763,187
65 to 69	351	8,618,746	35	606,428	73	1,258,047	459	10,483,221
70 to 74	178	2,386,170	6	129,123	58	884,270	242	3,399,564
75 to 79	37	345,764	3	28,081	23	340,842	63	714,687
80 to 84	2	27,111	-	-	2	27,826	4	54,937
85 to 89	-	-	-	-	-	-	-	-
90 to 94	-	-	-	-	-	-	-	-
95 and over	-	-	-	-	-	-	-	-
Total	**2,478**	**$ 119,907,628**	**335**	**$ 10,875,210**	**438**	**$ 8,093,397**	**3,251**	**$ 138,876,236**

Schedule of Retiree Member Data – Police – Receiving District and/or Federal Benefits

Shown below is the schedule of all retiree member data. The benefits are the total member benefits and include both those that are the District's responsibility and those that are the responsibility of the U.S. Department of the Treasury.

Attained Age	Service Retirement No.	Service Retirement Annual Benefits	Disability Retirement No.	Disability Retirement Annual Benefits	Survivors and Beneficiaries No.	Survivors and Beneficiaries Annual Benefits	Total No.	Total Annual Benefits
Under 20	-	$ -	-	$ -	39	$ 415,416	39	$ 415,416
20 to 24	-	-	-	-	3	161,760	3	161,760
25 to 29	-	-	3	108,456	1	54,924	4	163,380
30 to 34	-	-	5	204,828	-	-	5	204,828
35 to 39	-	-	11	421,752	5	191,904	16	613,656
40 to 44	1	76,524	16	584,808	7	218,904	24	880,236
45 to 49	78	6,410,100	38	1,564,032	31	898,560	147	8,872,692
50 to 54	614	52,120,080	101	4,213,464	66	2,094,300	781	58,427,844
55 to 59	750	60,682,920	84	3,363,504	92	2,912,508	926	66,958,932
60 to 64	470	38,511,204	80	3,454,500	137	4,667,379	687	46,633,083
65 to 69	554	40,010,781	121	6,206,640	218	7,713,177	893	53,930,599
70 to 74	858	55,590,264	137	6,855,492	311	11,004,703	1,306	73,450,459
75 to 79	474	31,244,424	106	5,646,960	265	9,595,608	845	46,486,992
80 to 84	234	15,575,700	63	3,571,392	217	8,131,668	514	27,278,760
85 to 89	72	5,064,720	29	1,788,456	104	4,104,504	205	10,957,680
90 to 94	12	1,232,772	19	1,308,936	59	2,197,092	90	4,738,800
95 and	-	-	4	258,288	17	659,844	21	918,132
Total	**4,117**	**$ 306,519,489**	**817**	**$ 39,551,508**	**1,572**	**$ 55,022,250**	**6,506**	**$ 401,093,248**

Schedule of Retiree Member Data – Police – Receiving Federal Benefits

Shown below is the schedule of retiree member data. The benefits are only those member benefits that are the responsbility of the U.S. Department of the Treasury.

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20	-	$ -	-	$ -	19	$ 85,900	19	$ 85,900
20 to 24	-	-	-	-	2	90,625	2	90,625
25 to 29	-	-	-	-	1	54,924	1	54,924
30 to 34	-	-	-	-	-	-	-	-
35 to 39	-	-	-	-	1	1,794	1	1,794
40 to 44	-	-	-	-	2	50,267	2	50,267
45 to 49	66	761,177	-	-	12	183,562	78	944,740
50 to 54	583	11,933,265	39	499,697	34	734,257	656	13,167,219
55 to 59	715	19,147,938	77	1,241,451	47	1,483,126	839	21,872,515
60 to 64	448	17,438,089	75	2,062,617	100	3,380,181	623	22,880,888
65 to 69	544	31,392,035	119	5,600,212	177	6,455,130	840	43,447,378
70 to 74	856	53,204,094	135	6,726,369	274	10,120,432	1,265	70,050,895
75 to 79	473	30,898,660	106	5,618,879	252	9,254,766	831	45,772,305
80 to 84	234	15,548,589	63	3,571,392	216	8,103,842	513	27,223,823
85 to 89	72	5,064,720	29	1,788,456	104	4,104,504	205	10,957,680
90 to 94	12	1,232,772	19	1,308,936	59	2,197,092	90	4,738,800
95 and over	-	-	4	258,288	17	659,844	21	918,132
Total	**4,003**	**$ 186,621,339**	**666**	**$ 28,676,298**	**1,317**	**$ 46,960,247**	**5,986**	**$ 262,257,884**

Schedule of Retiree Member Data – Fire – Receiving District Benefits

Shown below is the schedule of retiree member data. The benefits are only those member benefits that are the District's responsibility.

Attained Age	Service Retirement No.	Service Retirement Annual Benefits	Disability Retirement No.	Disability Retirement Annual Benefits	Survivors and Beneficiaries No.	Survivors and Beneficiaries Annual Benefits	Total No.	Total Annual Benefits
Under 20	-	$ -	-	$ -	17	$ 394,758	17	$ 394,758
20 to 24	-	-	-	-	1	4,404	1	4,404
25 to 29	-	-	-	-	-	-	-	-
30 to 34	-	-	3	114,084	2	69,177	5	183,261
35 to 39	-	-	9	334,452	3	24,123	12	358,575
40 to 44	-	-	9	399,972	2	44,424	11	444,396
45 to 49	22	1,758,487	10	521,364	7	139,683	39	2,419,534
50 to 54	131	9,262,898	22	838,051	17	472,015	170	10,572,965
55 to 59	221	13,662,117	12	404,677	33	937,547	266	15,004,341
60 to 64	237	12,112,810	11	306,897	25	725,547	273	13,145,254
65 to 69	154	5,571,140	19	371,332	26	656,558	199	6,599,031
70 to 74	67	1,254,026	6	25,374	22	380,842	95	1,660,242
75 to 79	20	213,147	-	-	7	156,455	27	369,601
80 to 84	1	18,914	-	-	4	70,924	5	89,838
85 to 89	-	-	-	-	2	32,628	2	32,628
90 to 94	-	-	-	-	-	-	-	-
95 and over	-	-	-	-	-	-	-	-
Total	**853**	**$ 43,853,538**	**101**	**$ 3,316,204**	**168**	**$ 4,109,085**	**1,122**	**$ 51,278,826**

Schedule of Retiree Member Data – Fire – Receiving District and/or Federal Benefits

Shown below is the schedule of all retiree member data. The benefits are the total member benefits and include both those that are the District's responsibility and those that are the responsibility of the U.S. Department of the Treasury.

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20	-	$ -	-	$ -	17	$ 513,996	17	$ 513,996
20 to 24	-	-	-	-	1	4,404	1	4,404
25 to 29	-	-	-	-	-	-	-	-
30 to 34	-	-	3	114,084	2	93,528	5	207,612
35 to 39	-	-	9	334,452	3	28,272	12	362,724
40 to 44	-	-	9	399,972	3	77,256	12	477,228
45 to 49	22	2,182,404	10	521,364	7	157,008	39	2,860,776
50 to 54	131	11,642,292	22	888,624	19	644,436	172	13,175,352
55 to 59	221	19,164,072	12	565,176	38	1,231,224	271	20,960,472
60 to 64	237	21,739,296	17	763,104	36	1,316,148	290	23,818,548
65 to 69	169	14,974,512	44	2,541,396	55	2,024,976	268	19,540,884
70 to 74	143	12,152,244	40	2,394,564	83	3,065,838	266	17,612,646
75 to 79	181	13,914,096	43	2,712,432	100	3,608,068	324	20,234,596
80 to 84	117	9,473,724	42	2,762,472	93	3,334,792	252	15,570,988
85 to 89	48	3,789,072	15	877,200	46	1,777,572	109	6,443,844
90 to 94	9	839,496	7	480,396	34	1,403,832	50	2,723,724
95 and over	1	70,716	2	142,872	11	511,608	14	725,196
Total	**1,279**	**$ 109,941,924**	**275**	**$ 15,498,108**	**548**	**$ 19,792,958**	**2,102**	**$ 145,232,990**

Schedule of Retiree Member Data – Fire – Receiving Federal Benefits

Shown below is the schedule of retiree member data. The benefits are only those member benefits that are the responsbility of the U.S. Department of the Treasury.

Attained Age	Service Retirement No.	Service Retirement Annual Benefits	Disability Retirement No.	Disability Retirement Annual Benefits	Survivors and Beneficiaries No.	Survivors and Beneficiaries Annual Benefits	Total No.	Total Annual Benefits
Under 20	-	$ -	-	$ -	6	$ 119,238	6	$ 119,238
20 to 24	-	-	-	-	-	-	-	-
25 to 29	-	-	-	-	-	-	-	-
30 to 34	-	-	-	-	1	24,351	1	24,351
35 to 39	-	-	-	-	2	4,149	2	4,149
40 to 44	-	-	-	-	1	32,832	1	32,832
45 to 49	22	423,917	-	-	2	17,325	24	441,242
50 to 54	130	2,379,394	7	50,573	8	172,421	145	2,602,387
55 to 59	216	5,501,955	12	160,499	14	293,677	242	5,956,131
60 to 64	227	9,626,486	16	456,207	20	590,601	263	10,673,294
65 to 69	160	9,448,251	43	2,170,064	40	1,438,367	243	13,056,681
70 to 74	143	10,898,218	40	2,369,190	72	2,684,996	255	15,952,404
75 to 79	181	13,700,949	43	2,712,432	95	3,451,613	319	19,864,995
80 to 84	117	9,454,810	42	2,762,472	89	3,293,820	248	15,511,102
85 to 89	48	3,789,072	15	877,200	44	1,744,944	107	6,411,216
90 to 94	9	839,496	7	480,396	34	1,403,832	50	2,723,724
95 and over	1	70,716	2	142,872	11	511,608	14	725,196
Total	**1,254**	**$ 66,133,266**	**227**	**$ 12,181,904**	**439**	**$ 15,783,774**	**1,920**	**$ 94,098,943**

Schedule of Retiree Member Data – Added and Removed from Rolls – Receiving District Benefit

Shown below is the schedule of District retiree members added and removed.

		District Benefit ($ in Thousands)								
		Added		Removed			Rolls at End of Year			
Fiscal Year Ended	Plan	Number	Annual Allowances	Number	Annual Allowances	Increase due to Plan Amendments	Number	Annual Allowances	Percentage Increase in Annual Allowances	Average Annual Allowances
September 30, 2018	Teachers	160	$ 4,892	69	$ 977	$ 1,419	3,990	$ 76,535	7.5%	$ 19
	Police	208	10,269	34	683	1,427	2,593	83,476	15.2%	32
	Fire	63	2,910	11	226	441	848	28,348	12.4%	33
September 30, 2019	Teachers	141	$ 4,693	72	$ 1,278	$ 1,890	4,059	$ 81,840	6.9%	$ 20
	Police	233	12,244	27	569	1,492	2,799	96,643	15.8%	35
	Fire	68	3,673	16	252	501	900	32,270	13.8%	36
September 30, 2020	Teachers	98	$ 3,471	86	$ 1,767	$ 1,824	4,071	$ 85,368	4.3%	$ 21
	Police	188	10,010	35	757	2,835	2,952	108,731	12.5%	37
	Fire	86	5,258	9	551	884	977	37,861	17.3%	39
September 30, 2021	Teachers	96	$ 3,642	95	$ 1,524	$ 1,124	4,072	$ 88,610	3.8%	$ 22
	Police	201	11,821	58	1,173	1,192	3,095	120,571	10.9%	39
	Fire	63	3,829	20	519	440	1,020	41,611	9.9%	41
September 30, 2022	Teachers	111	$ 3,945	118	$ 2,060	$ 6,191	4,065	$ 96,686	9.1%	$ 24
	Police	199	11,329	43	866	7,842	3,251	138,876	15.2%	43
	Fire	113	7,540	11	415	2,543	1,122	51,279	23.2%	46

Information for October 1, 2018 and earlier was taken from the valuation report prepared by Cavanaugh Macdonald Consulting, LLC, dated December 17, 2018.

Schedule of Retiree Member Data – Added and Removed from Rolls – Receiving Federal and/or District Benefit

Shown below is the schedule of Federal and/or District retiree members added and removed.

Fiscal Year Ended	Plan	Federal Plus District Benefit ($ in Thousands)									
		Added		Removed		Increase due to Plan Amendments	Rolls at End of Year			Average Annual Allowances
		Number	Annual Allowances	Number	Annual Allowances		Number	Annual Allowances	Percentage Increase in Annual Allowances	
September 30, 2018	Teachers	226	$ 8,601	281	$ 9,897	$ 4,195	6,006	$ 273,706	1.1%	$ 46
	Police	300	17,322	228	9,611	5,322	6,229	329,451	4.1%	53
	Fire	81	4,649	78	3,786	2,310	2,037	119,833	2.7%	59
September 30, 2019	Teachers	165	$ 6,648	248	$ 10,146	$ 5,088	5,923	$ 275,295	0.6%	$ 46
	Police	314	18,580	184	8,464	7,848	6,359	347,414	5.5%	55
	Fire	98	5,985	90	4,425	3,306	2,045	124,700	4.1%	61
September 30, 2020	Teachers	124	$ 4,710	271	$ 11,621	$ 5,880	5,776	$ 274,265	-0.4%	$ 47
	Police	272	15,538	211	9,937	8,123	6,420	361,138	4.0%	56
	Fire	119	7,848	102	4,935	2,182	2,062	129,795	4.1%	63
September 30, 2021	Teachers	108	$ 4,944	281	$ 12,343	$ 3,670	5,603	$ 270,537	-1.4%	$ 48
	Police	287	17,484	246	11,413	4,658	6,461	371,867	3.0%	58
	Fire	92	5,733	113	5,751	1,657	2,041	131,434	1.3%	64
September 30, 2022	Teachers	125	$ 5,176	256	$ 12,004	$ 19,590	5,472	$ 283,300	4.7%	$ 52
	Police	260	15,754	215	10,418	23,931	6,506	401,134	7.9%	62
	Fire	136	9,932	75	4,200	8,211	2,102	145,378	10.6%	69

Information for October 1, 2018 and earlier was taken from the valuation report prepared by Cavanaugh Macdonald Consulting, LLC, dated December 17, 2018.

Section VI. Summary of Plan Provisions

B

Teachers' Retirement Plan

Effective Date
Established on September 18, 1998, the Plan applies to benefit payments based on service accrued after June 30, 1997. The U.S. Department of the Treasury is responsible for paying all benefits accrued before this date.

Definitions
Affiliated Employers
District of Columbia Public Schools

Covered Members
Teachers and other educational employees in a salary class position ET 1-15 under the District of Columbia Public Schools (DCPS) system become members automatically on their date of employment. Covered members who leave the DCPS system to work for a D.C. public charter school may elect to remain in the Plan. Such members who are on a leave of absence to teach in a D.C. public charter school must remain in the Plan. Substitute teachers and rehired retirees are not covered.

Service Credit
One year of teaching service is given for each year of employment with DCPS. Service credit may also include purchased prior civilian government service and outside teaching service. For purposes of retirement eligibility and benefit accrual, creditable Federal and District service is aggregated in determining total creditable service.

Average Salary
Highest 36 consecutive months of pay, divided by three.

Vested
Members who accrue five or more years of creditable DCPS teaching service are vested for benefits. If a vested members leaves service, they may leave their Member Contributions with the Plan for a future deferred vested benefit when reaching eligibility for retirement (deferred vested in this report).

Contributions
Member Contributions
Members hired before November 1, 1996 are required to contribute 7% of annual pay. Members hired on or after November 1, 1996 contribute 8% of annual pay. Interest is not credited to each Member's accumulated contributions.

Refund of Member Contributions
In the event a member leaves service prior to retirement, vested members may leave their contributions in the Plan or request a refund. Nonvested members must take a refund. No interest is accrued on contributions.

Service Retirement

Eligibility

The Age and Service Credit requirements to be eligible for a full Service Retirement are listed below:

Members hired before November 1, 1996

Age	Service Credit
55	30, including 5 years DCPS service
60	20, including 5 years DCPS service
62	5 years DCPS service

Members hired on and after November 1, 1996

Age	Service Credit
Any Age	30, including 5 years DCPS service
60	20, including 5 years DCPS service
62	5 years DCPS service

Benefit

For members hired before November 1, 1996:
- 1.5% of Average Salary times service through 5 years, plus
- 1.75% of Average Salary times service from 6 through 10 years, plus
- 2.0% of Average Salary times service over 10 years.

For members hired on or after November 1, 1996:
- 2.0% of Average Salary times service.

All members receive a minimum benefit of 1.0% of Average Salary plus $25 for each year of service.

Involuntary Service Retirement

Eligibility

The Age and Service Credit requirements to be eligible for a Reduced Service Retirement are listed below:

All Members, regardless of date of hire

Age	Service Credit
Any Age	25, including 5 years DCPS service
50	20, including 5 years DCPS service

Benefit

Service Retirement Benefit reduced by 1/6% per month (or 2% per year) that date of retirement precedes age 55.

Disability Retirement

Eligibility
Active members with five or more years of DCPS service credit are covered (vested) for disability retirement. To be eligible, the member must be found to be incapable of satisfactorily performing the duties of his/her position as determined by DCPS.

Benefit
Equal to Service Retirement benefit. Minimum benefit is the lesser of a) or b):

    a. 40% of Average Salary
    b. Calculated benefit amount by projecting service to age 60.

Survivor Benefits

Lump Sum
Eligibility
Death before completion of 18 months of school service or death without an eligible spouse/domestic partner, child or parent.

Benefit
Refund of member contributions.

Spouse/Domestic Partner Only
Eligibility
Death before retirement and married/registered domestic partnership for at least two years, or have a child by the marriage or registered domestic partnership.

Benefit
55% of Service Retirement benefit. Minimum benefit is the lesser of a) or b):

    a. 55% of 40% of Average Salary
    b. 55% of the calculated benefit amount by projecting service to age 60.

Spouse/Domestic Partner & Dependent Children
Eligibility
Death before retirement and married/registered domestic partnership for at least two years, or have a child by the marriage or registered domestic partnership. Children must be unmarried and not in a domestic partnership and under age 18, 22 if full-time student, or any dependent child incapable of self-support due to a disability incurred before age 18. Death does not have to occur before retirement for the children's benefit.

Spouse/Domestic Partner Benefit
55% of Service Retirement benefit. Minimum benefit is the lesser of a) or b):

- 55% of 40% of Average Salary
- 55% of the calculated benefit amount by projecting service to age 60.

Survivor Benefits

Spouse/Domestic Partner & Dependent Children (continued)
Child Benefit
A benefit per child equal to the smallest of a) or b) or c):

 a. 60% of Average Salary divided by the number of eligible children
 b. $8,076[1] (if hired before 1/1/1980), $7,776[1] (if hired between 1/1/1980 and 10/31/1996), or $7,260[1] (if hired on or after 11/1/1996) per child
 c. $24,228[1] (if hired before 1/1/1980), $23,328[1] (if hired between 1/1/1980 and 10/31/1996), or $21,780[1] (if hired on or after 11/1/1996) divided by the number of children.

Dependent Children Only
Eligibility
Children must be unmarried and not in a domestic partnership and under age 18, 22 if full-time student, or any dependent child incapable of self-support due to a disability incurred before age 18. Death does not have to occur before retirement for the children's benefit.

Benefit
A benefit per child equal to the smallest of a) or b) or c):

 a. 60% of Average Salary divided by the number of eligible children
 b. $9,876[1] (if hired before 1/1/1980), $9,492[1] (if hired between 1/1/1980 and 10/31/1996), or $8,784[1] (if hired on or after 11/1/1996) per child
 c. $29,628[1] (if hired before 1/1/1980), $28,476[1] (if hired between 1/1/1980 and 10/31/1996), or $26,352[1] (if hired on or after 11/1/1996) divided by the number of children.

Parents Only
Eligibility
Death before retirement and no eligible spouse/domestic partner or children, and parents must have received at least one-half of their total income from the member immediately before the member's death.

Benefit
55% of Service Retirement benefit. Minimum benefit is the lesser of a) or b):

 a. 55% of 40% of Average Salary
 b. 55% of the calculated benefit amount by projecting service to age 60.

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[1] Survivor benefit amounts are as of March 1, 2022 and are subject to annual inflation adjustments.

Deferred Vested Retirement

Eligibility
Active members with five or more years of DCPS service credit.

Benefit
Benefit is calculated in the same manner as Service Retirement benefit and may be collected starting at age 62.

Retirement Options

Retirement and disability benefits are payable for the life of the retired member. Optional reduced retirement benefits may be elected at the time of retirement to provide for continuation of a reduced survivor benefit amount to a designated beneficiary. Optional forms include:

a. Reduced Annuity with a Maximum Survivor Annuity (to Spouse/Domestic Partner):
   Reduced benefit paid to the member so that upon the member's death, the spouse/domestic partner will receive 55% of the unreduced (normal life) annuity. Member's benefit is reduced by 2.5% of retirement benefit, up to $3,600, plus 10% of any retirement benefit over $3,600.

b. Reduced Annuity with a Partial Survivor Annuity (to Spouse/Domestic Partner)
   Reduced benefit paid to the member so that upon the member's death, the spouse/domestic partner will receive a partial annuity that can range from $1 up to any amount less than 55% of the unreduced (normal life) annuity amount. Member's benefit is reduced by the same amount as option a) above, multiplied by the ratio of the chosen benefit percent to the maximum benefit percent (55%).

c. Reduced Annuity with a Life Insurance Benefit
   Member elects a life insurance amount, payable in a lump sum to a designated beneficiary upon the member's death.

d. Reduced Annuity with a Survivor Annuity to a Person with an Insurable Interest
   A 55% joint and survivor annuity where the original benefit is reduced by 10% plus an additional 5% for each full 5 years, up to 25 years, that the designated beneficiary is younger than the member. Maximum reduction is 40% for any beneficiary who is 25 or more years younger than the member.

Cost-of-Living Adjustments (COLA)
Each year on March 1, benefits which have been paid for at least twelve months preceding March 1 may be increased. The increase is equal to the annual Consumer Price Index (CPI-W Washington/Baltimore area). COLA's are included in benefit payments on and after April 1. If a member's retirement is effective after March 1 of the preceding year, the COLA amount is prorated.

For members hired on or after November 1, 1996, the cost-of-living increase is limited to no more than 3% per year.

Changes since Prior Valuation
The child death benefit amounts were increased with inflation effective March 1, 2022.

Section VI. Summary of Plan Provisions

Police Officers and Firefighters' Retirement Plan

Effective Date
Established on September 18. 1998, the Plan applies to benefit payments based on service accrued after June 30, 1997. The U.S. Department of the Treasury is responsible for paying all benefits accrued before this date.

Definitions
Affiliated Employers
The District of Columbia Metropolitan Police Department (MPD) and the District of Columbia Department of Fire and Emergency Medical Services (FEMS).

Covered Members
Sworn Police Officers and Firefighters become members on their first day of active duty (cadets are not eligible). Membership is not automatic for uniformed EMT Firefighters. EMTs must be cross-trained in fire suppression, go through the fire academy, and considered sworn Firefighters.

Service Credit
One year of service is given for each year of employment with MPD or FEMS. Service Credit may also include approved purchased lateral transferred service, prior civilian government service and prior military service. For purposes of retirement eligibility and benefit accrual, creditable Federal and District service is aggregated in determining total creditable service.

Average Salary
For members hired before February 15, 1980, the highest 12 consecutive months of pay. For members hired on or after February 15, 1980, the highest 36 consecutive months of pay, divided by 3. Base pay does not include overtime, holiday or military pay. Longevity pay is included in Firefighters' base pay and in Police Officers' base pay once the member has completed 25 years of service.

Vested
Members who accrue five or more years of Service Credit are vested for benefits. If these members leave service, they may leave their Member Contribution Accounts with the Plan for a future benefit when reaching eligibility for retirement (deferred vested in this report).

Contributions

Member Contributions

Members hired before November 10, 1996 contribute 7.0% of salary. Members hired on or after November 10, 1996 contribute 8.0% of salary. Member contributions, together with any purchased service credit payments, are credited to individual Member Contribution Accounts. No interest is accrued on contributions.

Refund of Member Contributions

In the event a vested member leaves service prior to retirement, member contributions may be left in the Plan or refunded upon request. Nonvested members must take a refund. No interest is accrued on contributions.

Service Retirement

Eligibility

The Age and Service Credit requirements to be eligible for a full Service Retirement are listed below:

Members hired before November 10, 1996

Age	Service Credit
Any age	20 years departmental service (only if hired before 2/15/1980)
50	25 years departmental service
60	5 years departmental service

Members hired on and after November 10, 1996

Age	Service Credit
Any age	25 years departmental service
60	

Benefit

For members hired before November 10, 1996:

- 2.5% of Average Salary times departmental service up to 25 years (20 years if hired before 2/15/1980), plus
- 3.0% of Average Salary times departmental service over 25 years (or 20 years if hired before 2/15/1980), plus
- 2.5% of Average Salary times purchased or credited service.

For members hired on or after November 10, 1996:

- 2.5% of Average Salary times total service.

All members are subject to a maximum benefit of 80% of Average Salary.

Service-Related Disability Retirement

Eligibility

Disabled as a result of an injury or disease that permanently disables him/her for the performance of duty.

Benefit

For members hired before February 15, 1980:
2.5% of Average Salary times total years of service, subject to a minimum of 66-2/3% of Average Salary and a maximum of 70% of Average Salary.

For members hired on or after February 15, 1980:
70% of final pay times percentage of disability, subject to a minimum of 40% of final pay.

Nonservice-Related Disability Retirement

Eligibility

Active members with five or more years of departmental service are covered (vested) for disability retirement. The member is eligible if found that the disability precludes further service with his/her department.

Benefit

For members hired before February 15, 1980:
2.0% of Average Salary times total years of service, subject to a minimum of 40% of Average Salary and a maximum of 70% of Average Salary.

For members hired on or after February 15, 1980:
70% of final pay times percentage of disability, subject to a minimum of 30% of final pay.

Survivor Benefits

Lump Sum
Eligibility
Death before retirement without an eligible spouse/domestic partner or child.

Benefit
Refund of member contributions according to Plan's order of precedence.

Lump Sum – Death In Line Of Duty
Eligibility
Death occurring in the line of duty, not resulting from willful misconduct.

Benefit
$50,000

Survivor Benefits

Spouse Only – Death In Line Of Duty

Eligibility

Member killed in line of duty, after December 29, 1993.

Benefit

100% of final pay.

Spouse Only – Death Not In Line Of Duty

Eligibility

Member death, not in line of duty, after December 29, 1993. If retired, must be married for at least one year or have a child by the marriage/domestic partnership.

Benefit

40% of the greater of a) or b):

a. Average Salary
b. Salary for step 6 salary class 1 of the DC Police and Firemen's Salary Act in effect, adjusted for cost-of-living increases if death occurs after retirement.

Benefit cannot be higher than rate of pay at death (or retirement if death occurs after retirement).

Spouse/Domestic Partner & Dependent Children

Eligibility

Member death, not in line of duty, after December 29, 1993. If retired, must be married/in a domestic partnership for at least one year or have a child by the marriage/domestic partnership. Children must be unmarried, not in a domestic partnership and under age 18, 22 if full-time student, or any dependent child incapable of self-support due to having a disability incurred before age 18. Death does not have to occur before retirement for the children's benefit.

Spouse Benefit

40% of the greater of a) or b):

a. Average Salary
b. Salary for step 6 salary class 1 of the DC Police and Firemen's Salary Act in effect, adjusted for cost-of-living increases if death occurs after retirement.

Benefit cannot be higher than rate of pay at death (or retirement if death occurs after retirement).

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Survivor Benefits

Spouse/Domestic Partner & Dependent Children (continued)

Child Benefit

A benefit per child equal to the smallest of a) or b) or c):

    a. 60% of Average Salary divided by the number of eligible children

    b. $4,716[2] (if hired before 11/10/1996) or $4,440[2] (if hired on or after 11/10/1996) per child

    c. $14,148[2] (if hired before 11/10/1996) or $13,320[2] (if hired on or after 11/10/1996) divided by the number of children.

Dependent Children Only

Eligibility

Children must be unmarried and not in a domestic partnership and under age 18, 22 if full-time student, or any dependent child incapable of self-support due to a disability incurred before age 18. Death does not have to occur before retirement for the children's benefit.

Benefit

75% of Average Salary divided by the number of eligible children, adjusted for cost-of-living increases.

Deferred Vested Retirement

Eligibility

Active members with five or more years of departmental service.

Benefit

Benefit is calculated in the same manner as Service Retirement benefit and may be collected starting at age 55.

Retirement Options

Retirement and disability benefits are payable for the life of the retired member. This includes an unreduced joint and survivor annuity as defined above in the "Survivor Benefits – Spouse/Domestic Partnership and Dependent Children" sections.

An optional reduced benefit may be elected at the time of retirement to provide for an additional survivor benefit to a designated beneficiary. Member's original annuity is reduced by 10% and that amount is added to the survivor's benefit. If the designated beneficiary is more than five years younger than the member, the additional amount will be reduced by 5% for each full five years that the beneficiary is younger than the member, subject to a maximum of 40%.

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[2] Survivor benefit amounts are as of March 1, 2022 and are subject to annual inflation adjustments.

Cost-of-Living Adjustments (COLA)

Each year on March 1, benefits which have been paid for at least twelve months preceding March 1 may be increased. The increase is equal to the annual Consumer Price Index (CPI-W Washington/Baltimore area). COLA's are included in benefit payments on and after April 1. If member's retirement is effective after March 1 of the preceding year, the COLA amount is prorated.

For members hired on or after November 10, 1996, the cost-of-living increase is limited to no more than 3% per year. Members hired before February 15, 1980, receive equalization pay, which is defined as the percentage increase of active employees' salary increases. Equalization increases are not paid to survivors.

Changes since Prior Valuation

The child death benefit amounts were increased with inflation effective March 1, 2022.

Section VII. Actuarial Methods and Assumptions

Valuation Date
All assets and liabilities are computed as of October 1, 2022. Demographic information was collected as of June 30, 2022. For valuation purposes (e.g., age, service), all members are treated as if remaining in the Plans as of October 1, 2022.

Investment Rate of Return
6.25% per annum, compounded annually (net of investment expenses).

Inflation Assumption
3.00% per annum.

Payroll Growth Assumption
4.00% per annum.

Percent Married
65% of Teachers, Police Officers, and Firefighters are assumed to be married, with the wife 3 years younger than the husband. Active members are assumed to have one dependent child aged 10.

Actuarial Method
The valuation is completed on the basis of the entry age normal cost method calculated on an individual basis with level percentage of pay normal cost.

Amortization of Unfunded Actuarial Accrued Liability
The unfunded actuarial accrued liability (UAAL) is amortized on a level dollar basis based on the following funding policy adopted by the Board in 2012 and amended in 2021:

- Amortize the legacy UAAL as of October 1, 2021 over a closed 15-year period.
- Amortize the assumption and method changes and experience gains for the October 1, 2021 valuation over a closed 20-year period from the valuation date.
- Amortize all subsequent benefit changes, assumption and method changes and experience gains or losses over a closed 20-year period from the date established.
- If a surplus exists (assets exceed liabilities), amortize over 30 years and eliminate all prior amortization bases.

Assets
The method of valuing assets is intended to recognize a "smoothed" market value of assets. Under this method, the difference between actual return on market value from investment experience and the expected return on market value is recognized over a five-year period. The actuarial value of assets is constrained to an 80% to 120% corridor around market value of assets.

Contribution Withdrawal Assumption
For Teachers, Police, and Firefighters, 20% of the vested members who terminate are assumed to elect a withdrawal of their contributions while the remaining 80% are assumed to leave their contributions in the Plan in order to be eligible for a benefit at their deferred retirement date.

Other Assumptions

To value the post-retirement death benefit for Police Officers and Firefighters, the benefit form for all retirements (normal or disabled) is assumed to be a 50% Joint and Survivor annuity for all participants. One-fifth of all Police Officer and Firefighter active deaths are assumed to occur in the line of duty.

Post Retirement Cost-of-Living Adjustment

The cost of living, as measured by the CPI, will increase at the rate of 3.25% per year for members hired prior to November 10, 1996 and 2.75% per year for members hired on or after November 10, 1996.

Credited Service and Date of Entry

Service is credited as elapsed time from date of hire. The entry date for participation is date of service.

Military Service and Unused Sick Leave Service

Teachers are assumed to have 0.25 years of combined unused sick leave and military service credit at retirement. All Police and Fire members are assumed to have 1 year of combined unused sick leave and military service credit at retirement.

Administrative Expenses

For Teachers, budgeted administrative expenses of 1.20% of payroll are added to the normal cost rate. For Police Officers and Firefighters, budgeted administrative expenses of 2.10% of payroll are added to the normal cost rate.

Mortality Assumptions

Healthy Retiree and Actives
- Teachers: Pub-2010 General Employee and Healthy Retiree Mortality Table
- Police and Fire: Pub-2010 Safety Employees and Healthy Retiree Mortality Table with male ages set forward 1 year

Disabled Retirees
- Teachers: Pub-2010 General Disabled Retiree Mortality Table
- Police and Fire: Pub-2010 Safety Disabled Retiree Mortality Table

Contingent Beneficiaries
- Teachers: Pub-2010 General Contingent Survivor Mortality Table
- Police and Fire: Pub-2010 Safety Contingent Survivor Mortality Table

Mortality Improvement Scale
Improvement scale MP-2021 is applied on a generational basis. The improvement scale will be updated annually with any subsequent updates available on the valuation date.

Liability for Terminated Non-Vested Participants

The Inactive with Deferred Benefits liability includes a liability for terminated non-vested participants who are due a refund of their contributions. The liability is equal to the refund amount as of the valuation date.

Section VII. Actuarial Methods and Assumptions

Teachers

Salary Increase Assumption
Representative values of the assumed annual rates of future salary increases are as follows:

Years of Service	Total Increase (Next Year)
5	7.10%
10	4.65
15	4.00
>=20	4.00

Termination Assumption
The assumed annual termination rates are shown in the following table:

Rate of Termination		
Service	Male	Female
0	25.0%	23.0%
1	26.0%	22.0%
2	22.0%	22.0%
3	20.0%	19.0%
4	14.7%	13.4%
5	14.7%	13.4%
6	13.0%	11.2%
7	13.0%	11.2%
8	13.0%	11.2%
9	13.0%	11.2%
>=10	9.4%	5.8%

Retirement Assumption

The assumed annual retirement rates are shown in the following table:

Age	Years of Service						
	5	6 - 19	20	21 - 24	25-29	30	31+
<=50	0%	0%	0%	0%	5%	20%	15%
50 - 59	0%	0%	5%	5%	5%	20%	15%
60 - 61	0%	0%	20%	15%	15%	20%	15%
62	20%	20%	20%	15%	15%	20%	15%
63 - 74	20%	15%	15%	15%	15%	20%	15%
75+	100%	100%	100%	100%	100%	100%	100%

Disability Assumption

Representative values of the assumed disability rates are shown in the following table:

Rate of Disability	
Age	Proposed Rates
30	0.010%
40	0.035%
50	0.010%
60	0.015%

Section VII. Actuarial Methods and Assumptions

Police Officers

Salary Increases

Police Officers are assumed to receive longevity increases applied to individual base pay at certain years of service. Representative values of the assumed annual rates of future salary increases are as follows:

Years of Service	Total Increase (Next Year)
5	6.25%
10	5.20
15	6.15
19	8.15
20	6.00
24	7.80
25	5.15
29	7.65
30+	7.25

Termination Assumption

The assumed annual termination rates are shown in the following table:

Rate of Termination		
Service	Male	Female
0	9.0%	10.0%
1	9.0%	7.0%
2	8.0%	7.0%
3	8.0%	5.0%
4	8.0%	3.8%
5	6.2%	3.8%
6	4.1%	2.7%
7	4.1%	2.7%
8	2.7%	2.7%
9	2.7%	2.7%
>=10	2.0%	2.0%

Retirement Assumption

The assumed annual retirement rates are shown in the following table:

Age	Years of Service						
	<=24	**25**	**26**	**27**	**28**	**29**	**>=30**
<62	0%	50%	25%	25%	30%	35%	30%
>=62	100%	100%	100%	100%	100%	100%	100%

Shown rates are for Tier 3 police officers. Tier 2 rates are limited to no earlier than age 50.

Disability Assumption

Representative values of the assumed annual disability rates are shown in the following table:

Age	Disability Retirement Rates
30	0.083%
40	0.173%
50	0.315%
60	0.383%

60% of Police disabilities are assumed to qualify as line of duty.

Section VII. Actuarial Methods and Assumptions

Firefighters

Salary Increases
Firefighters are assumed to receive longevity increases applied to individual base pay at certain years of service. Representative values of the assumed annual rates of future salary increases are as follows:

Years of Service	Total Increase (Next Year)
5	6.05%
10	6.05
14	7.30
15	4.85
19	6.30
20	4.25
24	5.20
25	4.80
29	6.00
30+	4.50

Termination Assumption
The assumed annual termination rates are shown in the following table:

	Percent Separating in the Next Year	
Service	Male	Female
0	9.0%	16.0%
1	7.0%	12.0%
2	4.2%	2.1%
3	4.2%	2.1%
4	3.4%	2.1%
5	3.4%	1.8%
6	3.4%	2.3%
7	1.7%	2.3%
8	1.7%	2.3%
9	1.7%	2.3%
>=10	1.0%	0.5%

Retirement Assumption

The assumed annual retirement rates are shown in the following table:

Age	Years of Service						
	<=24	25	26	27	28	29	>=30
<62	0%	15%	15%	15%	25%	25%	40%
>=62	100%	100%	100%	100%	100%	100%	100%

Shown retirements rates are for Tier 3 firefighters. Tier 2 rates are limited to no earlier than age 50.

Disability Assumption

Representative values of the assumed annual disability rates are shown in the following table:

Age	Disability Retirement Rates
30	0.135%
40	0.225%
50	0.300%
60	0.375%

60% of Fire disabilities are assumed to qualify as line of duty.

Rationale for Assumptions

The economic and demographic assumptions are based on the experience study for the period ending September 30, 2020, and were adopted by the Board on October 19, 2021.

Changes Since Prior Valuation

The COLA assumption was changed from 3.0% per year for all members to 3.25% per year for members hired prior to November 10, 1996 and 2.75% per year for members hired on or after November 10, 1996.

The mortality improvement scale was updated from MP2020 to MP2021. This assumption is updated annually.

All other assumptions remained the same since the prior valuation.

Section VIII. 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 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 (APVFB)
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 or a future retirement benefit. Expressed another way, 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 periodic determined contributions to a pension plan, calculated in accordance with the assumptions and methods used by the plan actuary. The ADC replaced the actuarially required contribution (ARC), with the replacement of GASB 27 with GASB 68.

Cost-of-Living Adjustment (COLA)
An annual increase in the amount of a retired member's or survivor's benefit intended to adjust the benefit for inflation.

Covered Group
Plan members included in the actuarial valuation.

Deferred Retirement Option Program (DROP)
A program allowing participants eligible to retire to continue working for a fixed period of time, while accumulating the benefit payments they would have received if they had retired on their entry to DROP.

Demographic Assumption
Assumptions regarding the future population of pension participants, including retirement, termination, disability and mortality assumptions.

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

Employer's Contributions
Contributions made in relation to the actuarially determined contributions of the employer (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 cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.

Expenses
Plan expenses paid by the plan 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 standards that replace GASB 25 and 27. They are effective for plan years beginning after June 14, 2013 and employer fiscal years beginning after June 14, 2014.

Investment Return Assumption or Investment Rate of Return (Discount Rate)
The rate used to adjust a series of future payments to reflect the time value of money.

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.

Normal Cost or Normal Actuarial Cost
That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Pay-As-You-Go (PAYG)
A method of financing a benefits plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

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 Liabilities
Obligations payable by the plan at the reporting date, including primarily, benefits and refunds due and payable to plan members and beneficiaries, and accrued investment and administrative expenses. Plan liabilities do not include actuarial accrued liabilities for benefits that are not due and payable at the reporting date.

Plan Members
The individuals covered by the terms of a Pension or Other Post-Employment Benefits (OPEB) 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.

Projected Unit Credit (PUC) Funding Method

An actuarial cost method that spreads the employee's benefit over their career as a level percentage of service. The normal cost is the present value of the portion of the benefit assigned to the current year. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.

Salary Improvement

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

Select and Ultimate Rates

Actuarial assumptions that contemplate different rates for successive years. Instead of a single assumed rate with respect to, for example, the investment return assumption, the actuary may apply different rates for the early years of a projection and a single rate for all subsequent years. For example, if an actuary applies an assumed investment return of 8 percent for year 2020, 7.5 percent for 2021, and 7 percent for 2022 and thereafter, then 8 percent and 7.5 percent are select rates, and 7 percent is the ultimate rate.

Unfunded Actuarial Accrued Liabilities

The excess of the present value of prospective pension 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 present value of future normal costs determined by any of several actuarial cost methods. For plans that define an accrued liability, this amount equals the excess of the accrued liability over plan 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.

Appendix 1

Summary of Funding Progress

Valuation Date	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability	(3) Percentage Funded (1) / (2)	(4) Unfunded Actuarial Accrued Liability (2) - (1)	(5) Annual Covered Payroll	(6) Unfunded Actuarial Accrued Liability as a Percentage of Covered Payroll (4) / (5)
Teachers' Retirement Plan						
10/1/2018	$ 2,139,911	2,301,314	93.0%	$ 161,403	470,749	34.3%
10/1/2019	2,271,160	2,494,291	91.1%	223,131	516,609	43.2%
10/1/2020	2,431,075	2,640,803	92.1%	209,728	551,835	38.0%
10/1/2021	2,684,368	2,698,618	99.5%	14,250	600,481	2.4%
10/1/2022	2,838,193	2,871,570	98.8%	33,376	612,463	5.4%
Police Officers and Firefighters' Retirement Plan						
10/1/2018	$ 5,848,576	5,223,760	112.0%	$ (624,816)	454,209	(137.6%)
10/1/2019	6,269,628	5,604,573	111.9%	(665,055)	495,809	(134.1%)
10/1/2020	6,676,013	6,023,843	110.8%	(652,169)	507,348	(128.5%)
10/1/2021	7,290,173	6,181,614	117.9%	(1,108,559)	492,787	(225.0%)
10/1/2022	7,612,268	6,639,124	114.7%	(973,145)	482,092	(201.9%)
Total						
10/1/2018	$ 7,988,487	7,525,074	106.2%	$ (463,413)	924,958	(50.1%)
10/1/2019	8,540,788	8,098,864	105.5%	(441,924)	1,012,418	(43.7%)
10/1/2020	9,107,088	8,664,646	105.1%	(442,442)	1,059,182	(41.8%)
10/1/2021	9,974,541	8,880,232	112.3%	(1,094,309)	1,093,267	(100.1%)
10/1/2022	10,450,461	9,510,693	109.9%	(939,768)	1,094,555	(85.9%)

($ in Thousands)

Information for October 1, 2018 and earlier was taken from the valuation report prepared by Cavanaugh Macdonald Consulting, LLC, dated December 17, 2018.

Analysis of the dollar amounts of net assets available for benefits, actuarial accrued liability, and unfunded actuarial accrued liability in isolation can be misleading. Expressing the net assets available for benefits as a percentage of the actuarial accrued liability provides one indication of funding status on a going-concern basis. Analysis of this percentage over time indicates whether the plan is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. Trends in unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of the District's progress made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.

Appendix 2

Valuation Solvency Test
The following table shows the accrued liabilities and the portion of accrued liabilities covered by reported assets.

	Aggregate Accrued Liabilities For			Portion of Accrued Liabilities Covered by Reported Asset			
Valuation Date	(1) Active Member Contributions	(2) Retirees, Survivors and Inactive Members	(3) Active Members (Employer Financed Portion)	Reported Assets	(1)	(2)	(3)
TEACHERS' RETIREMENT PLAN							
10/1/2018	165,629	1,234,796	900,889	2,193,598	100.0%	100.0%	88.0%
10/1/2019	228,893	1,263,613	1,001,785	2,264,428	100.0%	100.0%	77.1%
10/1/2020	302,072	1,304,905	1,033,826	2,411,390	100.0%	100.0%	77.8%
10/1/2021	333,512	1,336,297	1,028,810	2,934,307	100.0%	100.0%	100.0%
10/1/2022	297,570	1,474,603	1,099,397	2,573,334	100.0%	100.0%	72.9%
POLICE OFFICERS AND FIREFIGHTERS' RETIREMENT PLAN							
10/1/2018	267,845	2,258,695	2,697,220	6,015,953	100.0%	100.0%	100.0%
10/1/2019	338,775	2,547,138	2,828,542	6,256,213	100.0%	100.0%	100.0%
10/1/2020	352,281	2,903,981	2,817,790	6,620,190	100.0%	100.0%	100.0%
10/1/2021	357,729	3,106,359	2,741,743	7,963,277	100.0%	100.0%	100.0%
10/1/2022	348,012	3,706,133	2,635,421	6,901,545	100.0%	100.0%	100.0%

($ in Thousands)

Information for October 1, 2018 and earlier was taken from the valuation report prepared by Cavanaugh Macdonald Consulting, LLC, dated December 17, 2018.

Appendix 3

ASOP 51 Disclosure

Actuarial Standard of Practice No. 51 *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions* is effective for actuarial valuations after November 2018. The standard requires actuaries to provide information so that users of the report can better understand the potential for future results to vary from the results presented in this report and identify risks on the plan's future financial condition. This standard does not require the assessment to be based on numerical calculations.

Examples of risk common to most public plans include the following (generally listed from greatest to least risk):

- <u>Investment risk:</u> The potential that investment returns will be different than expected. The Trustees are well aware of this risk.
- <u>Contribution risk:</u> Most commonly this is associated with the potential that actual future contributions are not made in accordance with the plan's actuarially based funding policy. When this occurs, it can create negative long-term problems.
- <u>Longevity and other demographic risks:</u> The potential that mortality or other demographic experience will be different than expected.
- <u>Asset/liability mismatch risk:</u> The potential that changes in asset values are not matched by changes in the value of liabilities.
- <u>Cash flow risks:</u> The potential that contributions coming into the plan will not cover benefit payments. While common in well-funded plans, this still requires the use of interest, dividends or principal to cover benefit payments. When assets need to be sold (or more cash held) it can be an issue. Poorly funded plans with DROP lump sum payments can be a particular issue.

One item left off this list is "interest rate risk" (i.e., the potential that interest rates will be different than expected). This risk is common in corporate ERISA plans where funding is based on bond rates. Interest rates on bonds are still an important consideration when setting an expected return assumption and can change over time.

There are some plan maturity measures that are significant to understanding the risks associated with the plan. The following table shows four commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee group covered by the plan.

Appendix 3

ASOP 51 Disclosure

Teachers Risk Measure	10/1/2020	10/1/2021	10/1/2022	Conservative Measures
Retiree Liability as a Percent of Total Liability	42%	42%	43%	<50%
Assets to Payroll (Asset Volatility Ratio)	4.4	4.9	4.2	<5
Liabilities to Payroll (Liability Volatility Ratio)	4.8	4.5	4.7	<5
Benefit Payments to Contributions	0.9	0.8	0.8	<3

Police and Fire Risk Measure	10/1/2020	10/1/2021	10/1/2022	Conservative Measures
Retiree Liability as a Percent of Total Liability	47%	49%	54%	<50%
Assets to Payroll (Asset Volatility Ratio)	13.0	16.2	14.3	<5
Liabilities to Payroll (Liability Volatility Ratio)	11.9	12.5	13.8	<5
Benefit Payments to Contributions	1.1	1.1	1.2	<3

The Asset Volatility Ratio (AVR) is equal to the market value of assets (MVA) divided by payroll. A higher AVR implies that the Plan is exposed to greater contribution volatility. The current Teachers AVR of 4.2 indicates that a 1% asset gain/loss can be related to about 4.2% of the annual payroll. The current Police and Fire AVR of 14.3 indicates that a 1% asset gain/loss can be related to about 14.3% of the annual payroll. The Plan amortizes asset gains/losses over a period of 20 years for Teachers and surplus over a period of 30 years for Police and Fire. This would result in a change in the District's contribution of about 4.0% of payroll for Teachers and 1.0% of payroll for Police and Fire for each 1.0% change in market assets in each Plan.

The Liability Volatility Ratio (LVR) is equal to the Actuarial Accrued Liability (AAL) divided by payroll. A higher LVR implies that the Plan is exposed to greater contribution volatility due to changes in liability measurements. The current Teachers LVR of 4.7 indicates that a 1% liability gain/loss can be related to about 4.7% of the annual payroll. The current Police and Fire LVR of 13.8 indicates that a 1% liability gain/loss can be related to about 13.8% of the annual payroll. The Plan amortizes asset gains/losses over a period of 20 years for Teachers and surplus over a period of 30 years for Police and Fire. This would result in a change in the District's contribution of about 0.4% of payroll for Teachers and about 1.0% of payroll for Police and Fire for each 1.0% change in each Plan.

Appendix 3

ASOP 51 Disclosure

The use of payroll in these risk measures is an easily available substitute for the employer's revenue and often reflects the employer's ability to afford the plan. Each of these measures is a measure of plan maturity. Some ratios are approaching or outside of the "conservative" range because the plans are becoming more mature. Mature plans present more risk to plan sponsors because changes to the liability or assets will result in large changes in the unfunded liability as compared to the overall size of the employer as measured by payroll.

If the plan or employer were interested in doing more quantitative assessment of risks, the following are examples of tests 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.

Sensitivity Test—A process for assessing the impact of a change in an actuarial assumption on an actuarial measurement.

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.

Stress Test—A process for assessing the impact of adverse changes in one or relatively few factors affecting a plan's financial condition.

Appendix 4

D.C. Code §1-907.02(c) Adjustment to FY2024 Payment

Beginning in fiscal year 2001, the District payment was adjusted pursuant to D.C. Code §1-907.02(c). This section stipulates that "…the enrolled actuary shall determine whether the amount appropriated for the applicable fiscal year resulted in an overpayment or a shortfall based upon the actual covered payroll."

The D.C. Code §1-907.02(c) adjustment to the fiscal year 2024 District payment is calculated by taking the actual fiscal year 2022 covered payroll for each employee class and multiplying by the corresponding fiscal year 2022 contribution rates, which were determined as of October 1, 2020. This result is the fiscal year 2022 contribution that was required to be made by the District, based on actual payroll. The required contribution is then compared to the actual contribution that was paid by the District based on projected payroll. The difference between the required and actual contributions is the D.C. Code §1-907.02(c) adjustment. Any adjustment amount that cannot be used in a given year is carried forward to the next fiscal year.

The following table shows the D.C. Code §1-907.02(c) Adjustment to FY2024 Payment.

		Teachers	Police	Fire
1.	Actual FY2022 Covered Payroll	$ 587,150	$ 302,209	$ 160,120
2.	FY2022 Contribution Rate	12.26%	19.61%	23.68%
3.	Actual FY2022 Contribution Required	71,985	59,263	37,916
4.	Actual FY2022 Contribution Paid without Adjustment	70,524	68,786	42,180
5.	Preliminary D.C. Code §1-907.02(c) Adjustment to FY2024 Payment (3. - 4.)	1,461	(9,523)	(4,264)
6.	FY2022 Unrecognized Amount	0	0	0
7.	Final D.C. Code §1-907.02(c) Adjustment to FY2024 Payment (5. + 6.)	1,461	(9,523)	(4,264)
8.	Adjustment Applied to FY2024 Payment	$ 1,461	$ (9,523)	$ (4,264)
9.	Carryover Adjustment (7. - 8.)	0	0	0

($ in Thousands)

Appendix 5

Experience Gain/(Loss)

The following table shows the gain/(loss), or change in unfunded accrued liability, due to experience other than expected.

Experience Gain/(Loss)	Teachers	Police	Fire	Police and Fire	Total
Age & Service Retirements If members retire at older ages, there is a gain; if younger ages, a loss.	$ (1.0)	$ (13.9)	$ (5.4)	$ (19.3)	$ (20.4)
Disability Retirements If disability claims are less than assumed, there is a gain; if more claims, a loss.	0.4	1.2	2.0	3.2	3.6
Death-in Service Benefits If survivor claims are less than assumed, there is a gain; if more claims, there is a loss.	0.4	5.5	1.8	7.3	7.7
Withdrawal from Employment If more liabilities are released by withdrawals than assumed, there is a gain; if smaller releases, a loss.	4.3	1.8	(0.2)	1.6	5.9
Pay Increases If there are smaller pay increases than assumed, there is a gain; if greater increases, a loss.	34.8	67.7	24.2	91.9	126.7
New Members Additional unfunded actuarial accrued liability will produce a loss.	(26.3)	(8.3)	(2.1)	(10.4)	(36.7)
Investment Income If there is greater investment income than assumed, there is a gain; if less income, a loss.	(31.4)	(57.5)	(26.5)	(84.0)	(115.4)
Death after Retirement If retirees live longer than assumed, there is a loss; if not as long, a gain.	1.6	(8.3)	(6.6)	(14.8)	(13.2)
COLA/CPI If inflation is different than expected, gains or losses can occur.	(44.1)	(79.1)	(22.8)	(101.9)	(146.0)
Other Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, etc.	3.1	0.8	2.9	3.6	6.7
Gain/(Loss) During Year from Experience	(58.2)	(90.2)	(32.7)	(122.9)	(181.1)
Non-Recurring Items Adjustments for plan amendments, assumption changes, method changes or audit changes.	10.4	(14.9)	(1.3)	(16.2)	(5.9)
Composite Gain/(Loss) During Year	$ (47.9)	$ (105.1)	$ (34.0)	$ (139.1)	$ (187.0)

($ in Millions)

Appendix 6

Valuation Balance Sheet – Teachers

The following table shows the Teachers valuation balance sheet (present and prospective assets and the actuarial liabilities) as of October 1, 2022 which is presented in the DCRB ACFR.

Teachers Present and Prospective Assets		
Actuarial Value of Present Assets		$ 2,838,193,260
Present Value of Future Members' Contributions		422,278,469
Present Value of Future Employer Contributions		
Normal contributions	$ 316,683,561	
Unfunded accrued liability contributions	33,376,463	
Total Prospective Employer Contributions		350,060,024
Total Present and Prospective Assets		**$ 3,610,531,753**

Teachers Actuarial Liabilities		
Present Value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		$ 1,235,162,330
Present Value of prospective benefits payable on account of inactive members		239,440,416
Present Value of prospective benefits payable on account of present active members		
Service retirement benefits	$ 1,709,011,916	
Disability retirement benefits	30,350,118	
Survivor benefits	17,079,083	
Separation benefits	379,487,890	
Total		2,135,929,007
Total Actuarial Liabilities		**$ 3,610,531,753**

Appendix 7

Valuation Balance Sheet – Police and Fire

The following table shows the Police and Fire valuation balance sheet (present and prospective assets and the actuarial liabilities) as of October 1, 2022 which is presented in the DCRB ACFR.

Police and Fire Combined Present and Prospective Assets		
Actuarial Value of Present Assets		$ 7,612,268,200
Present Value of Future Members' Contributions		420,480,907
Present Value of Future Employer Contributions		
Normal contributions	$ 1,637,741,231	
Unfunded accrued liability contributions	(973,144,679)	
Total Prospective Employer Contributions		664,596,552
Total Present and Prospective Assets		**$ 8,697,345,659**

Police and Fire Combined Actuarial Liabilities		
Present Value of benefits payable on account of retired members and survivors of deceased members now drawing retirement benefits		$ 3,608,693,194
Present Value of prospective benefits payable on account of inactive members		97,439,649
Present Value of prospective benefits payable on account of present active members		
Service retirement benefits	$ 4,474,377,377	
Disability retirement benefits	195,572,859	
Survivor benefits	47,016,125	
Separation benefits	274,246,455	
Total		4,991,212,816
Total Actuarial Liabilities		**$ 8,697,345,659**