



United States Department of the Treasury District of Columbia Pensions Program

Actuarial Valuation Report

Valuation Date: October 1, 2018

Report Date: October 15, 2018

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Executive Summary

Highlights of the Actuarial Valuation

The actuarial valuation report has been completed for the following program for the most recent plan year:

United States Department of the Treasury District of Columbia Pensions Program (Program)

The Program refers to the federal responsibility for benefit payments under the following District of Columbia (D.C.) retirement plans: District of Columbia Police Officers and Firefighters' Retirement Plan, District of Columbia Teachers' Retirement Plan, and District of Columbia Judges' Retirement Plan. The designated assets for the federal administration of these plans are held in two separate funds. The District of Columbia Teachers, Police Officers and Firefighters Federal Pension Fund ("D.C. Federal Pension Fund") covers federal payments under the District of Columbia Police Officers and Firefighters' Retirement Plan and District of Columbia Teachers' Retirement Plan. The Judicial Retirement and Survivors Annuity Fund ("Judicial Retirement Fund") covers payments under the District of Columbia's Judges' Retirement Plan.

The purpose of this report is to present the results of the actuarial valuation including:

- To illustrate the current assets and liabilities of each Plan as of the end of Fiscal Year (FY) 2018 (October 1, 2017 through September 30, 2018);
- To review the experience of the Program over the past year and to discuss reasons for changes in Program costs;
- To determine the appropriate contribution to be paid by the Department of the Treasury to the Funds in FY 2019 (October 1, 2018 through September 30, 2019); and
- To identify and discuss any emerging trends in Program costs.

This report also includes certain statement line items and footnote disclosures necessary to compute the annual pension expense in accordance with Statement of Federal Financial Accounting Standards No. 5, Accounting for Liabilities of the Federal Government, and No. 33, Pensions, Other Retirement Benefits, and Other Postemployment Benefits: Reporting the Gains and Losses from Changes in Assumptions and Selecting Discount Rates and Valuation Dates (SFFAS 5 and SFFAS 33). Use of the valuation results for other purposes may not be appropriate.

Summary of Results

As of October 1, 2018	Police Officers and Firefighters', and Teachers' Plans	Judges' Plan
Actuarial Accrued Liability	\$ 8,163,045,193	\$ 255,567,267
Plan Assets	(3,818,529,238)	(170,055,020)
Unfunded Actuarial Accrued Liability	\$ 4,344,515,955	\$ 85,512,247
Normal Cost with Interest (including expected employee contributions)	N/A	\$ 5,600,000

Summary of Gains and Losses

As part the review of the valuation, an actuarial gain/loss analysis was performed. Expected liabilities and plan assets were developed presuming all demographic and economic assumptions from the prior valuation were realized during the plan year. These expected values were then compared to the actual results. The factors causing the liabilities or assets to be greater than expected (a loss for liabilities and a gain for assets), or smaller than expected (a gain for liabilities and a loss for assets) were isolated. Differences in liability not directly attributable to experience different than assumed, such as changes in assumptions and methods, were separately measured from this process.

The different sources of gains and losses, as well as their individual impacts, are outlined below.

Executive Summary

Highlights of the Actuarial Valuation

Source of Liability (Gain)/Loss due to Actuarial Experience

Source of Demographic (Gain)/Loss	Police Officers and Firefighters', and Teachers' Plans	Judges' Plan
(Gains)/Losses due to Plan Experience:		
Active Decrements	\$ (12,083,225)	\$ 1,779,339
Inactive Mortality	(7,862,193)	63,093
Salary Increase	(2,211,484)	234,729
New Entrants	N/A	-
Cost-of-Living Adjustment (COLA) Different than Expected	12,777,832	214,407
(Gains)/Losses due to Census Changes:	60,982,946	1,859,766
(Gains)/Losses due to Back Payment:	655,871	N/A
Total	\$ 52,259,747	\$ 4,151,334

We have provided clarification on these items below:

- **(Gains)/Losses due to Plan Experience:** The liability for each plan is expected to change based on certain demographic and economic assumptions; however, actual plan experience will differ to some degree. These items are all (gains) or losses due to plan experience being different than expected with these assumptions. This includes the following primary factors:

- **Active Decrements:** The previous actuarial valuation assumes that each active plan member has a particular probability of terminating, retiring, becoming disabled, or becoming deceased in each year. An individual (gain) or loss is generated based on the plan member's actual status in the current valuation year based on the differences between what was expected. The gain for the Police and Firefighters' and Teachers' Plan is primarily due to a large number of young active plan members that retired in the previous year. The loss for the Judges' Plan is primarily due to active plan members retiring sooner than expected.
- **Inactive Mortality:** The previous actuarial valuation assumes that each inactive plan member has a particular probability of becoming deceased in each year. An individual (gain) or loss is generated based on whether the plan member actually dies during the year. The gain shown for the Police and Firefighters' and Teachers' Plan is driven by plan members that unexpectedly passed away in the past year that will no longer receive payments. The loss for the Judges' Plan is minimal, but generally the fact that plan members, in aggregate, experienced less mortality than expected. This results in more benefits being paid out in the future.
- **Salary Increase:** The previous actuarial valuation assumes that salaries for active plan members will increase by a certain amount. An individual (gain) or loss is generated for each plan member based on their actual salary amount reported in the current valuation. A gain is reported when a plan member's actual salary is lower than the expected amount, and a loss is reported when a plan member's actual salary is higher than the expected amount. The retroactive salary increase negotiated for the Teachers Plan is reflected as a loss for the Police and Firefighters' and Teachers' Plan. This is offset by a gain due to the 0% salary increase for the Police and Firefighters' Plan.
- **New Entrants:** The actuarial valuation incurs a loss whenever new members enter the plan with past service. The Police and Firefighters' and Teachers' Plan is closed and will never incur a gain or loss due to this reason. The Judges' Plan did not report a loss because there were no new entrants with any past service reported in the current year's valuation data.

Executive Summary

Highlights of the Actuarial Valuation

- **COLA Different Than Expected:** The previous actuarial valuation assumes that retirement benefits for inactive plan members that are receiving benefits will increase by a certain amount. An individual (gain) or loss is generated for each plan member based on their actual benefit amount reported in the current valuation. The Police and Firefighters' and Teachers' Plan had a loss primarily due to a higher actual COLA percentage than expected. This loss was partially offset by the Police and Firefighters' Plan members who retired prior to February 15, 1980 and new inactive plan members commencing their benefit who did not receive an increase to their benefit in the past year.

- **(Gains)/Losses due to Census Changes:** Each year, ODCP prepares the census data that will be used as the basis for the annual valuation. Inevitably, there will be updates to the census data beyond those that we would expect due to the passage of time. This category of (gain)/loss is described in more detail below.

For the **Police and Firefighters' and Teachers' Plan**, the total loss amount includes the following:

- A \$2.0 million loss resulting from active plan members who retired or terminated within the past year, primarily due to benefits calculated at retirement different than previously estimated;
- A \$7.8 million loss resulting from data updates for continuing inactives, primarily due to correction of benefit amounts and retirement dates in the census data. The retirement date field is used to determine the COLA type and will generate a (gain) or loss when a data update causes this COLA type to change.
- A \$5.2 million loss resulting from new plan members identified due to data clean-up, as well as new beneficiaries identified for deceased plan members who were previously expected to have no future benefits due;
- A \$0.6 million loss resulting from rehires;
- A \$15.9 million loss resulting from new beneficiaries following the death of plan members for whom the chosen form of payment was unknown; and
- A \$29.5 million net loss resulting from ongoing data management, including unexpected changes to data fields such as hire date, salary, service, etc.

For the **Judges' Plan**, the total loss amount includes the following:

- A \$1.8 million loss resulting from active plan members who retired or terminated within the past year, primarily due to benefits calculated at retirement different than previously estimated;
- A loss of less than \$0.1 million resulting from data updates for continuing inactives, namely small corrections made to COLA calculations;
- A loss of less than \$0.1 million resulting from updates to the date of birth for new beneficiaries; and
- A net loss of less than \$0.1 million resulting from ongoing data management.

- **(Gains)/Losses due to Back Payment:** There were three beneficiaries in the Firefighters' Plan who were due a back payment due to the re-calculation of their benefits. This unanticipated lump sum will be paid during FY 2019. The amount has been included as a loss for the FY 2018 valuation and has been added to the FY 2019 expected benefit payments.

Executive Summary

Highlights of the Actuarial Valuation

Source of Asset (Gain)/Loss due to Actuarial Experience

Asset (Gain)/Loss	D.C. Federal Pension Fund	Judicial Retirement Fund
Beginning of Year Assets	\$ 3,851,858,284	\$ 162,650,267
Expected Return on Assets	25,373,013	5,351,782
Actual Return on Assets	<u>55,938,645</u>	<u>3,701,900</u>
Asset (Gain)/Loss	\$ (30,565,632)	\$ 1,649,882

The plan assets experienced the following rates of return during the prior plan year:

	D.C. Federal Pension Fund	Judicial Retirement Fund
Assets	1.47%	2.25%

The D.C. Federal Pension Fund experienced higher-than-anticipated returns on fund assets and the Judicial Retirement Fund experienced lower-than-anticipated returns on fund assets, thus resulting in an asset gain and an asset loss, respectively.

Changes in Plan Provisions from the Previous Valuation

The valuation for the current plan year was based on the same plan provisions as the valuation for the prior plan year. We are not aware of any other changes to the plans since the last valuation.

A full summary of the plan provisions and plan changes for each plan (if any) can be found later in this report in Appendix C: Plan Provisions Summary.

Source of Liability (Gain)/Loss due to Changes in Actuarial Assumptions from the Previous Valuation

Assumption Change	Police Officers and Firefighters', and Teachers' Plans	Judges' Plan
Discount Rate Assumption	\$ 372,287,600	\$ 5,074,161
Other Economic Assumptions	(175,884,966)	(1,057,509)
Non-Economic Assumptions	<u>(82,328,650)</u>	<u>(2,322,976)</u>
Total	\$ 114,073,984	\$ 1,693,676

The discount rate assumption was updated according to prescribed guidance. The Effective Interest Rate (EIR) for both plans decreased, causing a loss.

The other economic assumptions changed for this valuation were the cost-of-living adjustment (COLA) for annuitants and the salary increase assumption for active plan members. Due to the plans' composition of primarily inactive plan members, the COLA assumption is a primary driver in the calculation of liabilities. The decrease in the future expectation of these adjustments caused a gain for both plans. A detailed description of the changes since prior year is available in Appendix A: Actuarial Assumptions and Methods.

For the Police Officers and Firefighters', and Teachers' Plans, and the Judges' Plan, the non-economic assumption change included a mortality improvement scale update. The mortality improvement scale was changed from Scale MP-2016 to Scale MP-2017. Scale MP-2017 is the most up-to-date expectation of future longevity improvements. Scale MP-2017 does not presume as much longevity improvement as Scale MP-2016, thereby resulting in a liability gain to all plans.

A complete description of the actuarial assumptions and rationale can be found in Appendix A: Actuarial Assumptions and Methods and Appendix B: Rationale.

Executive Summary

Highlights of the Actuarial Valuation

Government Contributions

This report includes a calculation of the Government Contribution required to be made before the end of FY 2019 (excluding the reimbursement for expenses). The table below contains Government Contribution (excluding expenses) for FY 2018 and FY 2019.

Contribution Year	Government Contribution (excluding expenses)	
	D.C. Federal Pension Fund	Judiciary Retirement Fund
September 30, 2018	\$ 451,800,000	\$ 15,600,000
September 30, 2019	\$ 477,600,000	\$ 16,100,000

The increase in the Government Contribution amounts from FY2017 to FY2018 is explained in the table below.

	Police Officers and Firefighters', and Teachers' Plans	Judges' Plan
Full amortization of the 10/1/2008 (gain)/loss	\$ 25,000,000	\$ (100,000)
New amortization base for the 10/1/2018 experience loss	2,400,000	700,000
New amortization base for the 10/1/2018 assumption (gain)/loss	(1,600,000)	100,000
Normal Cost change	-	(300,000)
Employee Contribution change	-	100,000
Total	\$ 25,800,000	\$ 500,000

Actuarial Valuation Opinion

This report presents the results of the actuarial valuation of the Program as of October 1, 2018. In our opinion, this report is complete and accurate and represents fairly the actuarial position of the Program for the purposes stated herein.

This actuarial valuation has been prepared based upon plan member data and plan provisions provided by the Department of the Treasury as of May 1, 2018 (plan data was projected to September 30, 2018 by adjusting for expected mortality for inactive plan members) and the estimated asset information projected by the Department of the Treasury to September 30, 2018 (provided on July 27, 2018).

We have reviewed the data and other information provided for reasonableness, but have not independently audited the data or other information provided. We have no reason to believe the data and other information provided are not complete and accurate, and know of no further information that is essential to the preparation of the actuarial valuation.

In our opinion, all costs, liabilities, rates of interest, and other factors underlying these actuarial computations have been determined on the basis of actuarial assumptions and methods. Each is reasonable (or consistent with authoritative guidance) for the purposes described herein taking into account the experience of the Plans and future expectations and when combined, represent our best estimate of anticipated experience under the Plans.

Executive Summary

Actuarial Valuation Opinion

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 operations of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on each plan's funded status); and
- Changes in plan provisions or applicable law.

Our scope did not include analyzing the potential range of such future measurements; therefore, this analysis was not performed.

The undersigned with actuarial credentials collectively meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This report was prepared solely for the benefit and internal use of the Department of the Treasury. This report is not intended for the benefit of any other party and may not be relied upon by any third party for any purpose, and Deloitte Consulting LLP accepts no responsibility or liability with respect to any party other than the Department of the Treasury.

To the best of our knowledge, no employee of the Deloitte U.S. Firms is an officer or director of the employer. In addition, we are not aware of any relationship between the Deloitte U.S. Firms and the employer that may impair or appear to impair the objectivity of the work detailed in this report.

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Executive Summary

Summary of Results

Police Officers and Firefighters', and Teachers' Plans

	Valuation Date	
	October 1, 2018	October 1, 2017
Plan Member Counts		
Actives	1,547	1,841
Terminated Vested	199	216
Annuitants	13,540	13,542
Total	15,286	15,599
Contributions		
Federal Required Contribution	\$ 477,600,000	\$ 451,800,000
Present Value of Benefits (PVB)		
Active Plan Members		
Retirement Decrement	\$ 508,019,251	\$ 628,568,759
Termination Decrement	1,388,098	2,138,673
Disability Decrement	5,216,339	7,046,940
Death Decrement	1,845,363	2,395,354
Total	\$ 516,469,051	\$ 640,149,726
Inactive Plan Members		
Normal Retirees ¹	\$ 6,202,100,994	\$ 6,350,837,620
Terminated Vested	35,855,745	41,319,810
Disabled Retirees ¹	704,423,997	747,773,150
Beneficiaries	704,195,406	699,415,220
Total	\$ 7,646,576,142	\$ 7,839,345,800
Total PVB (inactive and active)	\$ 8,163,045,193	\$ 8,479,495,526
Unfunded Actuarial Accrued Liability (AAL)		
Active AAL	\$ 516,469,051	\$ 640,149,726
Inactive AAL	7,646,576,142	7,839,345,800
Total AAL	\$ 8,163,045,193	\$ 8,479,495,526
Asset Value as of Valuation Date	\$ (3,818,529,238)	\$ (3,851,858,284)
Unfunded AAL	\$ 4,344,515,955	\$ 4,627,637,242

¹Throughout this report, former spouses receiving benefits under a qualified domestic relations order are not included in counts, while their benefit amounts are included with their associated retired plan member.

Executive Summary

Summary of Results

Judges' Plan

	Valuation Date	
	October 1, 2018	October 1, 2017
Plan Member Counts		
Actives	61	64
Terminated Vested	-	-
Annuitants	94	92
Total	155	156
Contributions		
Government Contribution (excluding expenses)	\$ 16,100,000	\$ 15,600,000
Present Value of Benefits (PVB)		
Active Plan Members		
Retirement Decrement	\$ 126,685,652	\$ 129,084,460
Termination Decrement	-	-
Disability Decrement	-	-
Death Decrement	906,069	935,168
Total	\$ 127,591,721	\$ 130,019,628
Inactive Plan Members		
Normal Retirees ¹	\$ 160,271,351	\$ 153,844,909
Terminated Vested	-	-
Disabled Retirees ¹	2,983,729	2,960,881
Beneficiaries	8,373,915	7,568,250
Total	\$ 171,628,995	\$ 164,374,040
Total PVB (inactive and active)	\$ 299,220,716	\$ 294,393,668
Unfunded Actuarial Accrued Liability (AAL)		
Active AAL	\$ 83,938,272	\$ 83,705,793
Inactive AAL	171,628,995	164,374,040
Total AAL	\$ 255,567,267	\$ 248,079,833
Asset Value as of Valuation Date	\$ (170,055,020)	\$ (162,650,267)
Unfunded AAL	\$ 85,512,247	\$ 85,429,566
Total Normal Cost	\$ 5,600,000	\$ 5,900,000
Employee Contributions	(500,000)	(600,000)
Net Employer Normal Cost	\$ 5,100,000	\$ 5,300,000

¹Throughout this report, former spouses receiving benefits under a qualified domestic relations order are not included in counts, while their benefit amounts are included with their associated retired plan member.

Plan Cost

Amortization Schedule and Required Government Contribution

Police Officers and Firefighters', and Teachers' Plans

Amortization Base	Remaining Number of Years	Annual Amortization Installment	Outstanding Balance as of October 1, 2018
Initial Unfunded Accrued Liability	9	\$ 348,600,000	2,851,718,959
Assumption Change 10/1/2000	2	(22,200,000)	(43,910,138)
Assumption Change 10/1/2001	3	40,100,000	118,108,934
Plan Change 10/1/2001	3	16,000,000	47,125,759
Assumption Change 10/1/2004	6	13,700,000	78,091,721
Assumption Change 10/1/2005	7	(6,300,000)	(41,320,630)
Assumption Change 10/1/2006	8	39,800,000	293,937,519
Assumption Change 10/1/2007	9	3,600,000	29,449,766
Assumption Change 10/1/2008	10	3,300,000	29,513,981
(Gain)/Loss 10/1/2009	1	(18,500,000)	(18,391,490)
Assumption Change 10/1/2009	11	40,700,000	393,819,634
(Gain)/Loss 10/1/2010	2	(3,300,000)	(6,527,183)
Assumption Change 10/1/2010	12	10,500,000	108,981,330
(Gain)/Loss 10/1/2011	3	(16,200,000)	(47,714,831)
Assumption Change 10/1/2011	13	6,900,000	76,273,552
(Gain)/Loss 10/1/2012	4	500,000	1,945,447
Assumption Change 10/1/2012	14	32,500,000	380,312,491
(Gain)/Loss 10/1/2013	5	(9,900,000)	(47,619,614)
Assumption Change 10/1/2013	15	18,700,000	230,467,617
Funding Method Change 10/1/2013	15	(34,800,000)	(428,891,608)
(Gain)/Loss 10/1/2014	6	(6,900,000)	(39,330,867)
Assumption Change 10/1/2014	16	13,400,000	173,155,806
(Gain)/Loss 10/1/2015	7	(7,000,000)	(45,911,811)
Assumption Change 10/1/2015	17	(4,000,000)	(53,987,834)
(Gain)/Loss 10/1/2016	8	(10,000,000)	(73,853,648)
Assumption Change 10/1/2016	18	20,600,000	289,420,919
Method Change 10/1/2016	18	500,000	7,024,780
(Gain)/Loss 10/1/2017	9	1,500,000	12,270,736
Assumption Change 10/1/2017	19	5,000,000	72,906,536
(Gain)/Loss 10/1/2018	10	2,400,000	21,694,115
Assumption Change 10/1/2018 ¹	20	(1,600,000)	(24,243,993)
Total Amortization		\$ 477,600,000	\$ 4,344,515,955
Total Normal Cost with Interest		\$ -	
Employee Contributions		-	
Net Employer Normal Cost		\$ -	
Total Required Government Contribution as of September 30, 2019²		\$ 477,600,000	

¹ Includes assumption change impact, \$114,073,984, as well as effect of discount rate change on prior amortization balances, (\$138,317,977).

² Before administrative expenses.

Plan Cost

Amortization Schedule and Required Government Contribution

Judges' Plan

Amortization Base	Remaining Number of Years	Annual Amortization Installment	Outstanding Balance as of October 1, 2018
Initial Unfunded Accrued Liability	9	\$ 2,100,000	\$ 16,176,855
Assumption Change 10/1/2000	2	(600,000)	(1,144,267)
Assumption Change 10/1/2001	3	500,000	1,408,075
Assumption Change 10/1/2004	6	200,000	1,075,227
Assumption Change 10/1/2006	8	600,000	4,171,248
Assumption Change 10/1/2008	10	200,000	1,686,189
(Gain)/Loss 10/1/2009	1	600,000	581,226
Assumption Change 10/1/2009	11	(800,000)	(7,308,685)
(Gain)/Loss 10/1/2010	2	100,000	190,711
Assumption Changes 10/1/2010	12	1,500,000	14,728,068
(Gain)/Loss 10/1/2011	3	100,000	281,615
Assumption Changes 10/1/2011	13	100,000	1,048,020
(Gain)/Loss 10/1/2012	4	(400,000)	(1,478,698)
Assumption Changes 10/1/2012	14	600,000	6,672,596
(Gain)/Loss 10/1/2013	5	800,000	3,639,829
Assumption Changes 10/1/2013	15	400,000	4,696,694
Funding Method Change 10/1/2013	15	(1,000,000)	(11,741,736)
(Gain)/Loss 10/1/2014	6	2,900,000	15,590,798
Assumption Change 10/1/2014	16	200,000	2,468,611
(Gain)/Loss 10/1/2015	7	100,000	617,663
Assumption Change 10/1/2016	18	300,000	4,046,951
Method Change 10/1/2016	18	500,000	6,744,919
(Gain)/Loss 10/1/2017	9	400,000	3,081,306
Assumption Change 10/1/2017	19	800,000	11,229,168
(Gain)/Loss 10/1/2018	10	700,000	5,801,216
Assumption Change 10/1/2018 ¹	20	100,000	1,248,648
Total Amortization		\$ 11,000,000	\$ 85,512,247
Total Normal Cost with Interest		\$ 5,600,000	
Employee Contributions		(500,000)	
Net Employer Normal Cost		\$ 5,100,000	
Total Required Government Contribution as of September 30, 2019²		\$ 16,100,000	

¹ Includes assumption change impact, \$1,693,676, as well as effect of discount rate change on prior amortization balances, (\$445,028).

² Before administrative expenses.

Changes in Actuarial Accrued Liability

Reconciliation of Actuarial (Gain)/Loss

	Police Officers and Firefighters', and Teachers' Plans		Judges' Plan	
Assets				
As of October 1, 2017, before adjustments	\$	3,851,858,284	\$	162,650,267
As of October 1, 2017, after adjustments		3,850,090,142		162,776,401
Contributions:				
Employees	\$	-	\$	640,623
Employer		467,121,351		16,033,703
Total		467,121,351		16,674,326
Benefits Paid		(541,067,692)		(12,537,770)
Expenses Paid		(15,321,350)		(433,703)
Income (including adjustments)		55,938,645		3,701,900
Expected Income		25,373,013		5,351,782
Expected End of Year Value		3,787,963,606		171,704,902
October 1, 2018 (Projected) Value		3,818,529,238		170,055,020
Asset (Gain)/Loss	\$	(30,565,632)	\$	1,649,882
Liabilities				
October 1, 2017 AAL	\$	8,479,495,526	\$	248,079,833
Normal Cost:				
Employees		-		600,000
Employers		-		5,300,000
Total		-		5,900,000
Benefits Paid		(541,067,692)		(12,537,770)
Interest		58,283,628		8,280,194
Expected September 30, 2018 AAL		7,996,711,462		249,722,257
Actual September 30, 2018 AAL before assumption and method changes ^{1,2}		8,048,971,209		253,873,591
Liability (Gain)/Loss		52,259,747		4,151,334
Total Experience (Gain)/Loss	\$	21,694,115	\$	5,801,216

Summary of Changes in Assumptions and Methods

(Gains)/Losses	Police Officers and Firefighters', and Teachers' Plans		Judges' Plan	
Change in Discount Rate		372,287,600		5,074,161
Change in Other Economic Assumptions ³		(175,884,966)		(1,057,509)
Change in Non-Economic Assumptions ⁴		(82,328,650)		(2,322,976)
Total Impact	\$	114,073,984	\$	1,693,676
Actual End of Year AAL after assumption and method changes	\$	8,163,045,193	\$	255,567,267

¹ Liabilities as of 10/01/2018 for the Police Officers and Firefighters', and Teachers' Plans calculated for this purpose are based on 2018 spot rates implied by the 2017 spot rate yield curve. These spot rates used in gain/loss analysis were calculated by converting the 2017 spot rates to forward rates, removing the forward rate for FY 2018, and then converting the forward rates back to spot rates. See Appendix A: Actuarial Assumptions and Methods for an example of the rates.

² The liabilities as of 10/01/2018 for the Police Officers and Firefighters', and Teachers' Plans include the \$655,871 lump sum amount for the three beneficiaries in the Police Plan who were due a back payment due to the re-calculation of their benefits.

³ Projected salary increases and cost-of-living adjustments.

⁴ For Police Officers and Firefighters', and Teachers' Plans, and Judges' Plan, mortality improvement scale updated from Scale MP-2016 to Scale MP-2017.

Asset Information

Statement of Changes in Net Plan Assets

The following table is based on the unaudited statement of assets projected to September 30, 2018, as provided by the Department of the Treasury on July 27, 2018.

	Police Officers and Firefighters', and Teachers' Plans	Judges' Plan
Projected net assets available for benefits as of October 1, 2017	\$ 3,851,858,284	\$ 162,650,267
Adjusted from estimate to actual	<u>(1,768,142)</u>	<u>126,134</u>
Actual net assets available as of October 1, 2017	\$ 3,850,090,142	\$ 162,776,401
Additions		
Contributions:		
Government contributions (amortization payment)	\$ 467,121,351	\$ 16,033,703
Employee contributions	<u>-</u>	<u>640,623</u>
Total contributions	\$ 467,121,351	\$ 16,674,326
Investment income (including interest) ¹	57,548,587	3,567,440
Miscellaneous additions	<u>158,200</u>	<u>8,326</u>
Total additions	\$ 524,828,138	\$ 20,250,092
Deductions		
Benefit payments:		
Annuities - Federal only	\$ (541,004,942)	\$ (12,537,770)
Refunds of contributions	<u>(62,750)</u>	<u>-</u>
Total benefit payments	\$ (541,067,692)	\$ (12,537,770)
Expenses and fees:		
Administrative expenses	\$ (18,250,183)	\$ (434,379)
Other expenses	<u>2,928,833</u>	<u>676</u>
Total expenses and fees	\$ (15,321,350)	\$ (433,703)
Total deductions	\$ (556,389,042)	\$ (12,971,473)
Net additions	\$ (31,560,904)	\$ 7,278,619
Net assets available for benefits as of October 1, 2018	<u>\$ 3,818,529,238</u>	<u>\$ 170,055,020</u>

¹ The approximate rate of return on the Market Value of Assets is 1.47% for the Police Officers and Firefighters', and Teacher's plans, and 2.25% for the Judges' plan.

Benefit Payments and Funding Projections

Benefit Payment Projections

Police Officers and Firefighters', and Teachers' Plans (closed group)

Fiscal Year Ending In	Expected Net Benefit Payments	Fiscal Year Ending In	Expected Net Benefit Payments
2019	\$ 544,680,316	2057	\$ 51,381,721
2020	540,677,315	2058	45,450,851
2021	535,777,153	2059	40,030,553
2022	529,458,023	2060	35,094,478
2023	521,705,164	2061	30,617,476
2024	512,429,365	2062	26,572,336
2025	502,001,002	2063	22,933,693
2026	490,316,660	2064	19,682,350
2027	477,381,289	2065	16,794,198
2028	463,497,263	2066	14,244,070
2029	448,811,110	2067	12,006,146
2030	433,323,874	2068	10,056,738
2031	417,108,558	2069	8,371,897
2032	400,351,372	2070	6,925,614
2033	383,095,703	2071	5,693,214
2034	365,450,230	2072	4,650,935
2035	347,502,817	2073	3,776,816
2036	329,353,062	2074	3,049,525
2037	311,098,541	2075	2,448,442
2038	292,854,687	2076	1,954,908
2039	274,734,708	2077	1,552,562
2040	256,851,769	2078	1,227,046
2041	239,314,249	2079	965,949
2042	222,222,783	2080	758,045
2043	205,669,884	2081	594,087
2044	189,738,205	2082	466,238
2045	174,497,972	2083	356,443
2046	160,006,807	2084	267,200
2047	146,302,723	2085	208,032
2048	133,408,932	2086	162,734
2049	121,331,917	2087	128,111
2050	110,062,481	2088	101,556
2051	99,581,268	2089	81,225
2052	89,860,239	2090	65,527
2053	80,865,296	2091	48,771
2054	72,557,580	2092	33,701
2055	64,899,837	2093	25,913
2056	57,853,758		

Benefit Payments and Funding Projections

Benefit Payment Projections

Police Officers (closed group)

Fiscal Year Ending In	Expected Net Benefit Payments	Fiscal Year Ending In	Expected Net Benefit Payments
2019	\$ 251,345,147	2057	\$ 32,490,934
2020	250,930,870	2058	28,990,215
2021	249,924,837	2059	25,735,471
2022	248,255,686	2060	22,722,404
2023	246,021,240	2061	19,947,052
2024	242,999,893	2062	17,405,481
2025	239,381,464	2063	15,092,967
2026	235,127,198	2064	13,003,144
2027	230,245,839	2065	11,128,611
2028	224,887,830	2066	9,460,823
2029	219,120,769	2067	7,989,192
2030	212,899,708	2068	6,701,701
2031	206,236,983	2069	5,585,154
2032	199,215,702	2070	4,624,883
2033	191,909,035	2071	3,806,026
2034	184,330,923	2072	3,113,620
2035	176,516,891	2073	2,532,615
2036	168,517,529	2074	2,048,562
2037	160,379,324	2075	1,648,166
2038	152,154,891	2076	1,319,410
2039	143,898,878	2077	1,051,477
2040	135,667,567	2078	834,836
2041	127,516,504	2079	661,164
2042	119,498,453	2080	523,065
2043	111,661,341	2081	414,163
2044	104,045,478	2082	328,975
2045	96,687,253	2083	252,208
2046	89,618,323	2084	188,420
2047	82,859,594	2085	148,680
2048	76,423,451	2086	118,066
2049	70,315,577	2087	94,426
2050	64,535,042	2088	76,134
2051	59,076,441	2089	61,954
2052	53,930,729	2090	50,882
2053	49,086,271	2091	37,639
2054	44,530,970	2092	25,318
2055	40,253,573	2093	19,674
2056	36,243,220		

Benefit Payments and Funding Projections

Benefit Payment Projections

Firefighters (closed group)

Fiscal Year Ending In	Expected Net Benefit Payments	Fiscal Year Ending In	Expected Net Benefit Payments
2019	\$ 94,307,203	2057	\$ 10,851,201
2020	92,994,737	2058	9,710,571
2021	92,003,446	2059	8,654,077
2022	90,900,535	2060	7,678,532
2023	89,492,774	2061	6,780,994
2024	87,799,790	2062	5,958,825
2025	85,901,718	2063	5,209,526
2026	83,744,132	2064	4,530,274
2027	81,363,950	2065	3,917,730
2028	78,812,423	2066	3,368,031
2029	76,122,259	2067	2,877,295
2030	73,332,648	2068	2,441,968
2031	70,463,887	2069	2,058,716
2032	67,538,603	2070	1,724,033
2033	64,580,140	2071	1,434,062
2034	61,608,528	2072	1,184,881
2035	58,638,914	2073	972,580
2036	55,686,363	2074	793,223
2037	52,765,193	2075	642,825
2038	49,888,002	2076	517,582
2039	47,066,378	2077	414,003
2040	44,309,992	2078	328,948
2041	41,626,334	2079	259,605
2042	39,021,186	2080	203,485
2043	36,498,884	2081	158,414
2044	34,062,673	2082	122,552
2045	31,715,663	2083	94,307
2046	29,460,058	2084	72,263
2047	27,297,128	2085	55,213
2048	25,228,071	2086	42,140
2049	23,253,559	2087	32,161
2050	21,373,866	2088	24,566
2051	19,589,245	2089	18,785
2052	17,900,139	2090	14,354
2053	16,305,726	2091	10,941
2054	14,804,631	2092	8,303
2055	13,396,094	2093	6,239
2056	12,078,919		

Benefit Payments and Funding Projections

Benefit Payment Projections

Teachers (closed group)

Fiscal Year Ending In	Expected Net Benefit Payments	Fiscal Year Ending In	Expected Net Benefit Payments
2019	\$ 199,027,967	2057	\$ 8,039,585
2020	196,751,708	2058	6,750,065
2021	193,848,871	2059	5,641,004
2022	190,301,801	2060	4,693,541
2023	186,191,150	2061	3,889,431
2024	181,629,682	2062	3,208,029
2025	176,717,820	2063	2,631,199
2026	171,445,329	2064	2,148,932
2027	165,771,500	2065	1,747,856
2028	159,797,010	2066	1,415,217
2029	153,568,082	2067	1,139,659
2030	147,091,518	2068	913,069
2031	140,407,689	2069	728,027
2032	133,597,067	2070	576,698
2033	126,606,528	2071	453,126
2034	119,510,779	2072	352,434
2035	112,347,012	2073	271,621
2036	105,149,169	2074	207,741
2037	97,954,024	2075	157,450
2038	90,811,794	2076	117,916
2039	83,769,452	2077	87,082
2040	76,874,211	2078	63,262
2041	70,171,412	2079	45,179
2042	63,703,144	2080	31,496
2043	57,509,660	2081	21,509
2044	51,630,054	2082	14,711
2045	46,095,057	2083	9,929
2046	40,928,426	2084	6,516
2047	36,146,001	2085	4,138
2048	31,757,410	2086	2,528
2049	27,762,780	2087	1,523
2050	24,153,572	2088	856
2051	20,915,581	2089	486
2052	18,029,371	2090	290
2053	15,473,299	2091	192
2054	13,221,980	2092	80
2055	11,250,169	2093	-
2056	9,531,620		

Benefit Payments and Funding Projections

Benefit Payment Projections

Judges' Plan (open group)

Fiscal Year Ending In	Expected Net Benefit Payments ¹
2019	\$ 13,946,691
2020	14,520,188
2021	14,771,713
2022	14,819,147
2023	15,193,579
2024	15,346,329
2025	15,310,058
2026	15,381,247
2027	15,450,501
2028	15,570,878
2029	15,644,850
2030	15,903,901
2031	15,938,518
2032	15,912,032
2033	15,815,732
2034	15,802,823
2035	15,959,927
2036	15,940,783
2037	15,907,973
2038	15,800,848
2039	15,660,654
2040	15,465,137
2041	15,492,963
2042	15,280,286
2043	15,196,443

¹ Expected Net Benefit Payments are net of retiree contributions paid to provide for survivor benefits.

Benefit Payments and Funding Projections

Benefit Payment Projections

Judges' Plan (closed group)

Fiscal Year Ending In	Expected Net Benefit Payments	Fiscal Year Ending In	Expected Net Benefit Payments
2019	\$ 13,946,691	2057	\$ 3,983,046
2020	14,520,080	2058	3,594,269
2021	14,771,448	2059	3,229,451
2022	14,818,667	2060	2,888,239
2023	15,192,833	2061	2,570,242
2024	15,345,224	2062	2,275,018
2025	15,308,253	2063	2,001,918
2026	15,377,780	2064	1,750,167
2027	15,444,668	2065	1,519,115
2028	15,562,044	2066	1,308,211
2029	15,632,370	2067	1,116,443
2030	15,851,899	2068	943,052
2031	15,827,451	2069	787,339
2032	15,727,548	2070	648,651
2033	15,503,423	2071	526,663
2034	15,320,592	2072	420,896
2035	14,995,670	2073	330,590
2036	14,639,828	2074	254,817
2037	14,293,149	2075	192,556
2038	13,906,920	2076	142,474
2039	13,393,302	2077	103,061
2040	12,859,307	2078	72,767
2041	12,558,716	2079	50,111
2042	11,970,331	2080	33,611
2043	11,474,532	2081	21,925
2044	10,864,796	2082	13,883
2045	10,307,749	2083	8,527
2046	9,697,612	2084	5,075
2047	9,094,863	2085	2,928
2048	8,502,425	2086	1,637
2049	7,923,031	2087	889
2050	7,358,947	2088	469
2051	6,812,231	2089	243
2052	6,284,731	2090	124
2053	5,778,144	2091	60
2054	5,293,863	2092	27
2055	4,832,909	2093	12
2056	4,395,902		

Benefit Payments and Funding Projections

District Benefit Payments

Police Officers and Firefighters', and Teachers' Plans

Fiscal Year Ending In	Benefits Paid by District (\$ millions)
1998-1999	\$ 2.3
2000	3.9
2001	4.6
2002	6.7
2003	10.9
2004	16.2
2005	21.7
2006	28.6
2007	38.4
2008	47.1
2009	58.1
2010	65.5
2011	73.3
2012	86.0
2013	99.8
2014	112.6
2015	126.4
2016	146.0
2017	163.0
2018	183.8

Benefit Payments and Funding Projections

15-Year Funding Projections - Closed Group

Police Officers and Firefighters', and Teachers' Plans

Fiscal Year Ending In	Expected Return on Assets	Beginning of Year Assets	Federal Contribution (with Expense Reimbursement)	Net Benefit Payments	Expenses	Investment Return	End of Year Assets
2019	0.59%	\$ 3,818,529,238	\$ 501,400,000	\$ (544,680,316)	\$ (23,800,000)	\$ 20,852,306	\$ 3,772,301,228
2020	1.05%	3,772,301,228	520,200,000	(540,677,315)	(24,100,000)	36,662,435	3,764,386,348
2021	1.69%	3,764,386,348	544,000,000	(535,777,153)	(22,400,000)	58,988,835	3,809,198,030
2022	2.32%	3,809,198,030	504,500,000	(529,458,023)	(22,800,000)	81,802,959	3,843,242,966
2023	2.87%	3,843,242,966	504,400,000	(521,705,164)	(23,200,000)	102,421,581	3,905,159,383
2024	3.27%	3,905,159,383	514,800,000	(512,429,365)	(23,700,000)	118,933,162	4,002,763,180
2025	3.65%	4,002,763,180	508,500,000	(502,001,002)	(24,200,000)	136,569,120	4,121,631,298
2026	3.89%	4,121,631,298	522,300,000	(490,316,660)	(24,700,000)	150,396,765	4,279,311,403
2027	3.95%	4,279,311,403	493,000,000	(477,381,289)	(25,200,000)	159,114,820	4,428,844,934
2028	4.19%	4,428,844,934	139,800,000	(463,497,263)	(25,700,000)	175,373,357	4,254,821,028
2029	4.18%	4,254,821,028	134,600,000	(448,811,110)	(26,200,000)	167,886,889	4,082,296,807
2030	4.20%	4,082,296,807	94,400,000	(433,323,874)	(26,700,000)	161,710,865	3,878,383,798
2031	4.16%	3,878,383,798	84,400,000	(417,108,558)	(27,200,000)	151,958,561	3,670,433,801
2032	4.20%	3,670,433,801	78,100,000	(400,351,372)	(27,800,000)	145,017,315	3,465,399,744
2033	4.05%	3,465,399,744	46,100,000	(383,095,703)	(28,300,000)	132,137,682	3,232,241,723

Benefit Payments and Funding Projections

15-Year Funding Projections - Open Group

Judges' Plan

Fiscal Year Ending In	Expected Return on Assets	Beginning of Year Assets	Employee Contributions	Federal Contribution (with Expense Reimbursement)	Net Benefit Payments	Expenses	Investment Return	End of Year Assets
2019	0.59%	\$ 170,055,020	\$ 514,486	\$ 17,300,000	\$ (13,946,691)	\$ (1,200,000)	\$ 960,160	\$ 173,682,975
2020	1.05%	173,682,975	519,477	16,049,470	(14,520,188)	(500,000)	1,748,418	176,980,152
2021	1.69%	176,980,152	524,515	16,599,420	(14,771,713)	(500,000)	2,870,599	181,702,973
2022	2.32%	181,702,973	529,603	16,049,854	(14,819,147)	(500,000)	4,035,847	186,999,130
2023	2.87%	186,999,130	534,740	16,500,778	(15,193,579)	(500,000)	5,146,326	193,487,395
2024	3.27%	193,487,395	539,927	15,752,195	(15,346,329)	(500,000)	6,076,787	200,009,975
2025	3.65%	200,009,975	545,165	12,804,112	(15,310,058)	(600,000)	7,023,628	204,472,822
2026	3.89%	204,472,822	550,453	12,756,532	(15,381,247)	(600,000)	7,658,059	209,456,619
2027	3.95%	209,456,619	555,792	12,209,460	(15,450,501)	(600,000)	7,967,917	214,139,287
2028	4.19%	214,139,287	561,183	9,762,902	(15,570,878)	(600,000)	8,648,048	216,940,542
2029	4.18%	216,940,542	566,627	8,916,862	(15,644,850)	(600,000)	8,738,519	218,917,700
2030	4.20%	218,917,700	572,123	9,771,345	(15,903,901)	(600,000)	8,855,316	221,612,583
2031	4.16%	221,612,583	577,673	8,326,357	(15,938,518)	(600,000)	8,878,883	222,856,978
2032	4.20%	222,856,978	583,276	8,281,903	(15,912,032)	(600,000)	9,016,180	224,226,305
2033	4.05%	224,226,305	588,934	7,837,988	(15,815,732)	(700,000)	8,766,593	224,904,088

Basis for the Valuation

Plan Member Summary

Police Officers and Firefighters', and Teachers' Plans

	Police Officers	Firefighters	Teachers	Total
Date Of Census Data:	5/1/2018	5/1/2018	5/1/2018	5/1/2018
Plan Member Counts:				
Actives	732	408	407	1,547
Terminated Vested	34	12	153	199
Normal Retirees ¹ - Current Benefits	3,821	1,153	4,987	9,961
Normal Retirees - Deferred Benefits	4	0	0	4
Beneficiaries	1,262	454	409	2,125
Disabled Retirees - Current Benefits	755	300	239	1,294
Disabled Retirees - Deferred Benefits	<u>114</u>	<u>21</u>	<u>21</u>	<u>156</u>
Total	6,722	2,348	6,216	15,286
Active Plan Member Characteristics:				
Total Pay	\$ 79,221,029	\$ 41,898,124	\$ 45,691,900	\$ 166,811,053
Average Age	50.87	51.51	58.12	52.95
Average Service	26.84	26.80	28.57	27.28
Inactive Plan Member Characteristics:				
<u>Average Age:</u>				
Terminated Vested	53.10	52.29	56.98	56.03
Normal Retirees	67.20	69.70	76.43	72.11
Beneficiaries	73.63	75.94	78.82	75.12
Disabled Retirees	69.58	74.45	76.42	71.88
<u>Total Annual Federal Benefits - Current:</u>				
Normal Retirees	\$ 179,098,301	\$ 63,780,482	\$ 184,612,452	\$ 427,491,234
Beneficiaries	39,382,368	14,274,024	8,345,820	62,002,212
Disabled Retirees	32,803,590	15,495,684	6,653,772	54,953,046
<u>Total Annual Federal Benefits - Deferred:</u>				
Terminated Vested	\$ 530,820	\$ 125,316	\$ 1,187,424	\$ 1,843,560
Normal Retirees	96,684	-	-	96,684
Disabled Retirees	1,168,332	185,052	180,972	1,534,356

¹ Throughout this report, "Normal Retirees" refer to Voluntary Retirements for the District of Columbia Teachers' Retirement Plan and Optional Retirements for the District of Columbia Police Officers and Firefighters' Retirement Plan.

Basis for the Valuation
Plan Member Summary
Judges' Plan

Date of Census Data	5/1/2018
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Plan Member Counts:

Actives	61
Terminated Vested	0
Normal Retirees ¹	79
Beneficiaries	14
Disabled Retirees	1
Total	155

Active Plan Member Characteristics

Total Compensation for Covered Plan Members	\$ 12,777,200
Average Age	59.81
Average Service	13.18

Inactive Plan Member Characteristics

Average Age

Terminated Vested	N/A
Normal Retirees	75.60
Beneficiaries	83.50
Disabled Retirees	62.42

Total Annual Benefits

Terminated Vested	N/A
Normal Retirees	\$ 11,787,916
Beneficiaries	1,014,238
Disabled Retirees	140,946

¹ Throughout this report, "Normal Retirees" refer to Regular Retirements for the District of Columbia Judges' Retirement Plan.

Basis for the Valuation

Plan Member Reconciliation

The following tables show a reconciliation of the number of plan members from the previous census date to the current census date.

Police Officers and Firefighters', and Teachers' Plans

	Actives	Terminated Vested	Normal Retirees	Beneficiaries	Disabled Retirees	Totals
Plan Members as of June 1, 2017	1,841	216	9,932	2,096	1,514	15,599
New Plan Members	0	0	0	0	0	0
Rehires	7	(7)	0	0	0	0
Vested Terminations	(3)	3	0	0	0	0
Retirements	(297)	(16)	313	0	0	0
Deaths - Beneficiary ¹	(1)	0	(100)	134	(31)	2
Deaths - No Beneficiary	(2)	(1)	(185)	(105)	(34)	(327)
Refund of Contributions	0	0	(1)	0	0	(1)
Disabled	0	0	0	0	0	0
Payments Reinstated/Ceased ²	0	0	0	(5)	1	(4)
Data Corrections	2	4	6	5	0	17
Plan Members as of June 1, 2018	1,547	199	9,965	2,125	1,450	15,286

Police Officers

	Actives	Terminated Vested	Normal Retirees	Beneficiaries	Disabled Retirees	Totals
Plan Members as of June 1, 2017	899	37	3,748	1,236	906	6,826
New Plan Members	0	0	0	0	0	0
Rehires	2	(2)	0	0	0	0
Vested Terminations	0	0	0	0	0	0
Retirements	(169)	(2)	171	0	0	0
Deaths - Beneficiary ¹	0	0	(57)	82	(23)	2
Deaths - No Beneficiary	0	(1)	(37)	(57)	(15)	(110)
Refund of Contributions	0	0	0	0	0	0
Disabled	0	0	0	0	0	0
Payments Reinstated/Ceased ²	0	0	0	(2)	1	(1)
Data Corrections	0	2	0	3	0	5
Plan Members as of June 1, 2018	732	34	3,825	1,262	869	6,722

¹ Includes deceased annuitants with multiple survivors.

² Payments ceased includes child survivors whose benefits expired upon attainment of age 23.

Basis for the Valuation

Plan Member Reconciliation

The following tables show a reconciliation of the number of plan members from the previous census date to the current census date.

Firefighters

	Actives	Terminated Vested	Normal Retirees	Beneficiaries	Disabled Retirees	Totals
Plan Members as of June 1, 2017	456	14	1,128	457	333	2,388
New Plan Members	0	0	0	0	0	0
Rehires	0	0	0	0	0	0
Vested Terminations	0	0	0	0	0	0
Retirements	(50)	(2)	52	0	0	0
Deaths - Beneficiary ¹	0	0	(17)	25	(8)	0
Deaths - No Beneficiary	(1)	0	(10)	(27)	(4)	(42)
Refund of Contributions	0	0	0	0	0	0
Disabled	0	0	0	0	0	0
Payments Reinstated/Ceased ²	0	0	0	(2)	0	(2)
Data Corrections	3	0	0	1	0	4
Plan Members as of June 1, 2018	408	12	1,153	454	321	2,348

Teachers

	Actives	Terminated Vested	Normal Retirees	Beneficiaries	Disabled Retirees	Totals
Plan Members as of June 1, 2017	486	165	5,056	403	275	6,385
New Plan Members	0	0	0	0	0	0
Rehires	5	(5)	0	0	0	0
Vested Terminations	(3)	3	0	0	0	0
Retirements	(78)	(12)	90	0	0	0
Deaths - Beneficiary	(1)	0	(26)	27	0	0
Deaths - No Beneficiary	(1)	0	(138)	(21)	(15)	(175)
Refund of Contributions	0	0	(1)	0	0	(1)
Disabled	0	0	0	0	0	0
Payments Reinstated/Ceased	0	0	0	(1)	0	(1)
Data Corrections	(1)	2	6	1	0	8
Plan Members as of June 1, 2018	407	153	4,987	409	260	6,216

¹ Includes deceased annuitants with multiple survivors.

² Payments ceased includes child survivors whose benefits expired upon attainment of age 23.

Basis for the Valuation

Plan Member Reconciliation

The following table shows a reconciliation of the number of plan members from the previous census date to the current census date.

Judges' Plan

	Actives	Terminated Vested	Normal Retirees	Beneficiaries	Disabled Retirees	Totals
Plan Members as of June 1, 2017	64	0	78	13	1	156
New Plan Members	1	0	0	0	0	1
Rehires	0	0	0	0	0	0
Vested Terminations	0	0	0	0	0	0
Retirements	(4)	0	4	0	0	0
Deaths - Beneficiary	0	0	(2)	2	0	0
Deaths - No Beneficiary	0	0	(1)	(1)	0	(2)
Refund of Contributions	0	0	0	0	0	0
Disabled	0	0	0	0	0	0
Payments Reinstated/Ceased	0	0	0	0	0	0
Data Corrections	0	0	0	0	0	0
Plan Members as of June 1, 2018	61	0	79	14	1	155

Basis for the Valuation

Age-Service Grid

Police Officers

Active Population															
Service	Under 20		20-24		25-29		30-34		35-39		40+		All Service		
Age Group	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	
0 - 39	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	
40 - 44	-	-	20	100,079	4	115,102	-	-	-	-	-	-	24	102,583	
45 - 49	-	-	120	108,308	193	106,079	7	108,665	-	-	-	-	320	106,971	
50 - 54	-	-	67	104,675	214	110,504	9	106,485	-	-	-	-	290	109,033	
55 - 59	-	-	11	110,411	54	105,078	19	122,722	2	130,104	-	-	86	110,240	
60 - 64	-	-	1	95,544	5	117,220	2	118,981	3	134,613	1	104,601	12	119,004	
65 - 69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
All Ages	-	\$ -	219	\$106,492	470	\$108,174	37	\$115,911	5	\$132,809	1	\$104,601	732	\$108,225	

Basis for the Valuation

Age-Service Grid

Firefighters

Active Population															
Service	Under 20		20-24		25-29		30-34		35-39		40+		All Service		
Age Group	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	
0 - 39	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	
40 - 44	-	-	4	95,181	13	97,299	-	-	-	-	-	-	17	96,801	
45 - 49	-	-	36	89,639	96	104,104	23	96,809	-	-	-	-	155	99,662	
50 - 54	-	-	49	88,990	83	107,917	18	146,401	-	-	-	-	150	106,352	
55 - 59	-	-	18	86,830	37	102,380	22	114,393	1	158,627	-	-	78	102,901	
60 - 64	-	-	-	-	3	86,008	3	128,385	2	91,346	-	-	8	103,234	
65 - 69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
All Ages	-	\$ -	107	\$ 89,076	232	\$104,578	66	\$117,631	3	\$113,773	-	\$ -	408	\$102,691	

Basis for the Valuation

Age-Service Grid

Teachers

Active Population															
Service	Under 20		20-24		25-29		30-34		35-39		40+		All Service		
Age Group	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	
0 - 39	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	
40 - 44	-	-	2	118,122	-	-	-	-	-	-	-	-	2	118,122	
45 - 49	-	-	40	110,437	10	112,119	-	-	-	-	-	-	50	110,773	
50 - 54	-	-	22	111,209	43	114,380	26	109,994	-	-	-	-	91	112,360	
55 - 59	-	-	21	110,581	33	114,141	47	112,021	2	117,905	-	-	103	112,521	
60 - 64	-	-	14	117,424	31	113,113	31	108,010	16	112,255	-	-	92	111,900	
65 - 69	-	-	4	109,546	19	111,985	19	113,257	7	110,809	6	118,934	55	112,855	
70+	-	-	3	110,055	1	114,126	5	114,401	2	124,428	3	111,845	14	114,335	
All Ages	-	\$ -	106	\$111,649	137	\$113,536	128	\$110,915	27	\$113,200	9	\$116,571	407	\$112,265	

Basis for the Valuation

Age-Service Grid

Judges

Active Population																					
Service	Under 1		1-4		5-9		10-14		15-19		20-24		25-29		30-34		35+		All Service		
Age Group	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	No.	Avg. Comp.	
0 - 34	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	
35 - 39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40 - 44	-	-	1	208,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	208,000	
45 - 49	-	-	1	208,000	5	210,520	1	208,000	-	-	-	-	-	-	-	-	-	-	7	209,800	
50 - 54	-	-	1	208,000	6	208,000	1	208,000	-	-	-	-	-	-	-	-	-	-	8	208,000	
55 - 59	1	208,000	3	208,000	5	213,040	1	208,000	7	209,871	1	208,000	-	-	-	-	-	-	18	210,128	
60 - 64	-	-	1	208,000	2	208,000	3	208,000	3	208,000	-	-	-	-	-	-	-	-	9	208,000	
65 - 69	-	-	-	-	-	-	4	211,150	2	208,000	3	208,167	2	208,000	-	-	-	-	11	209,191	
70+	-	-	-	-	-	-	1	220,600	2	214,300	1	208,000	1	208,000	1	208,000	1	208,000	7	211,600	
All Ages	1	\$208,000	7	\$208,000	18	\$210,100	11	\$210,291	14	\$209,836	5	\$208,100	3	\$208,000	1	\$208,000	1	\$208,000	61	\$209,462	

Basis for the Valuation

Federal Allocation by Plan

Police Officers and Firefighters', and Teachers' Plans

Active Plan Members	Police Officers		Firefighters		Teachers	
Number	732		408		407	
Average Age	50.87		51.51		58.12	
Average Service	26.84		26.80		28.57	
Average Pay	\$	108,225	\$	102,691	\$	112,265

Inactive Plan Members	Police Officers		Firefighters		Teachers	
	100% Federal	Partial Federal	100% Federal	Partial Federal	100% Federal	Partial Federal
Normal Retirees - Current Federal Benefit						
Number	1,956	1,865	545	608	1,617	3,370
Average Age	74.09	60.02	77.89	62.35	85.13	72.26
Average Federal Benefit	\$ 54,464	\$ 38,909	\$ 63,785	\$ 47,727	\$ 45,699	\$ 32,854
Average Total Benefit	\$ 54,464	\$ 75,222	\$ 63,785	\$ 84,175	\$ 45,699	\$ 52,573
Normal Retirees - Deferred Federal Benefit						
Number	N/A	4	N/A	0	N/A	0
Average Age	N/A	50.50	N/A	N/A	N/A	N/A
Average Federal Benefit	N/A	\$ 24,171	N/A	N/A	N/A	N/A
Average Total Benefit	N/A	\$ 68,562	N/A	N/A	N/A	N/A
Beneficiaries - Current Federal Benefit						
Number	1,105	157	403	51	282	127
Average Age	76.68	52.15	79.48	47.92	82.51	70.63
Average Federal Benefit	\$ 32,589	\$ 21,477	\$ 33,128	\$ 18,110	\$ 23,464	\$ 13,615
Average Total Benefit	\$ 32,589	\$ 31,967	\$ 33,128	\$ 33,930	\$ 23,464	\$ 19,447
Disabled Retirees - Current Federal Benefit						
Number	622	133	258	42	172	67
Average Age	74.73	61.18	77.99	64.32	81.32	69.58
Average Federal Benefit	\$ 46,866	\$ 27,465	\$ 53,809	\$ 38,405	\$ 31,770	\$ 17,750
Average Total Benefit	\$ 46,866	\$ 47,118	\$ 53,809	\$ 54,047	\$ 31,770	\$ 35,800
Disabled Retirees - Deferred Federal Benefit						
Number	N/A	114	N/A	21	N/A	21
Average Age	N/A	51.31	N/A	51.23	N/A	58.10
Average Federal Benefit	N/A	\$ 10,249	N/A	\$ 8,812	N/A	\$ 8,618
Average Total Benefit	N/A	\$ 37,515	N/A	\$ 37,983	N/A	\$ 36,173
Terminated Vested - Deferred Federal Benefit						
Number	N/A	34	N/A	12	N/A	153
Average Age	N/A	53.10	N/A	52.29	N/A	56.98
Average Federal Benefit	N/A	\$ 15,612	N/A	\$ 10,443	N/A	\$ 7,761

Basis for the Valuation

Plan Member Counts

Judges' Plan

Active Plan Members	
Number	61
Average Age	59.81
Average Service	13.18
Average Pay	\$ 209,462
Number Eligible to Retire	33

Inactive Plan Members	
Normal Retirees	
Number	79
Average Age	75.60
Average Benefit	\$ 149,214
Spouse Beneficiaries	
Number	13
Average Age	85.89
Average Benefit	\$ 77,542
Disabled Retirees	
Number	1
Average Age	62.42
Average Benefit	\$ 140,946
Child Beneficiaries	
Number	1
Average Age	52.38
Average Benefit	\$ 6,190

Basis for the Valuation

Inactive Benefit Information

Inactive Police Officers - Current Benefits

Normal Retirees	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	-	\$ -	\$ -
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	-	-	-	-	-
50-54	-	-	473	21,727	72,521
55-59	1	5,340	565	28,003	72,367
60-64	34	42,712	393	44,816	76,244
65-69	405	47,654	295	62,949	80,169
70-74	786	53,998	118	73,421	81,945
75-79	430	57,472	21	77,196	86,492
80-84	226	58,394	-	-	-
85-89	53	67,637	-	-	-
90-94	18	88,905	-	-	-
95-100	3	79,092	-	-	-
100 and over	-	-	-	-	-
Total	1,956	\$ 54,464	1,865	\$ 38,909	\$ 75,222

Beneficiaries	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	3	\$ 37,424	32	\$ 3,834	\$ 11,627
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	5	22,128	18	15,604	32,740
50-54	8	30,414	15	18,770	31,617
55-59	27	36,055	26	19,060	35,480
60-64	69	31,582	22	32,486	41,151
65-69	151	31,400	23	31,675	39,490
70-74	220	32,344	18	36,628	40,937
75-79	213	32,347	1	26,940	31,932
80-84	185	33,275	2	30,852	39,114
85-89	111	34,047	-	-	-
90-94	78	32,825	-	-	-
95-100	32	32,708	-	-	-
100 and over	3	34,216	-	-	-
Total	1,105	\$ 32,589	157	\$ 21,477	\$ 31,967

Basis for the Valuation

Inactive Benefit Information

Inactive Police Officers - Current Benefits

Disabled Retirees	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	-	\$ -	\$ -
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	1	21,372	-	-	-
50-54	7	21,833	-	-	-
55-59	22	24,916	67	15,669	39,640
60-64	44	35,681	43	31,221	50,779
65-69	114	44,558	19	56,255	62,604
70-74	151	44,716	3	52,352	62,384
75-79	112	47,926	1	34,548	50,688
80-84	84	53,274	-	-	-
85-89	47	57,663	-	-	-
90-94	33	60,351	-	-	-
95-100	6	67,944	-	-	-
100 and over	1	74,628	-	-	-
Total	622	\$ 46,866	133	\$ 27,465	\$ 47,118

Inactive Police Officers - Deferred Benefits

Terminated Vested	Count	Average Federal Benefit
Under 35	-	\$ -
35-39	-	-
40-44	-	-
45-49	7	12,021
50-54	19	13,545
55-59	7	21,189
60-64	1	40,992
65-69	-	-
70-74	-	-
75-79	-	-
80-84	-	-
85-89	-	-
90-94	-	-
95-100	-	-
100 and over	-	-
Total	34	\$ 15,612

Basis for the Valuation

Inactive Benefit Information

Inactive Police Officers - Deferred Benefits

Normal Retirees	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	\$ -
35-39	-	-	-
40-44	-	-	-
45-49	1	14,604	22,896
50-54	3	27,360	83,784
55-59	-	-	-
60-64	-	-	-
65-69	-	-	-
70-74	-	-	-
75-79	-	-	-
80-84	-	-	-
85-89	-	-	-
90-94	-	-	-
95-100	-	-	-
100 and over	-	-	-
Total	4	\$ 24,171	\$ 68,562

Disabled Retirees	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	\$ -
35-39	-	-	-
40-44	1	4,416	37,248
45-49	34	9,063	39,479
50-54	75	10,781	36,530
55-59	4	11,799	39,357
60-64	-	-	-
65-69	-	-	-
70-74	-	-	-
75-79	-	-	-
80-84	-	-	-
85-89	-	-	-
90-94	-	-	-
95-100	-	-	-
100 and over	-	-	-
Total	114	\$ 10,249	\$ 37,515

Basis for the Valuation

Inactive Benefit Information

Inactive Firefighters - Current Benefits

Normal Retirees	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	-	\$ -	\$ -
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	-	-	-	-	-
50-54	-	-	45	20,663	70,759
55-59	-	-	168	31,143	78,324
60-64	2	44,196	219	44,020	82,852
65-69	35	48,819	117	65,183	87,972
70-74	148	59,792	50	91,441	105,998
75-79	187	66,295	9	113,025	122,083
80-84	109	65,408	-	-	-
85-89	47	72,277	-	-	-
90-94	16	70,878	-	-	-
95-100	1	58,752	-	-	-
100 and over	-	-	-	-	-
Total	545	\$ 63,785	608	\$ 47,727	\$ 84,175

Beneficiaries	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	1	\$ 33,336	15	\$ 7,791	\$ 20,141
35-39	-	-	1	1,176	4,152
40-44	1	29,028	-	-	-
45-49	-	-	5	10,577	58,918
50-54	2	32,508	6	11,676	32,656
55-59	8	27,575	6	16,630	33,814
60-64	16	29,805	6	27,904	38,114
65-69	28	30,574	9	34,015	42,568
70-74	65	32,593	3	36,424	39,656
75-79	96	31,800	-	-	-
80-84	61	32,966	-	-	-
85-89	61	35,225	-	-	-
90-94	49	37,087	-	-	-
95-100	13	35,538	-	-	-
100 and over	2	29,634	-	-	-
Total	403	\$ 33,128	51	\$ 18,110	\$ 33,930

Basis for the Valuation

Inactive Benefit Information

Inactive Firefighters - Current Benefits

Disabled Retirees	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	-	\$ -	\$ -
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	-	-	-	-	-
50-54	-	-	-	-	-
55-59	3	21,988	6	13,934	41,866
60-64	13	40,854	16	29,951	49,295
65-69	28	47,958	18	50,423	60,323
70-74	42	52,355	2	71,280	72,108
75-79	75	57,004	-	-	-
80-84	45	54,476	-	-	-
85-89	30	55,751	-	-	-
90-94	16	59,801	-	-	-
95-100	5	63,017	-	-	-
100 and over	1	72,732	-	-	-
Total	258	\$ 53,809	42	\$ 38,405	\$ 54,047

Inactive Firefighters - Deferred Benefits

Terminated Vested	Count	Average Federal Benefit
Under 35	-	\$ -
35-39	-	-
40-44	-	-
45-49	4	14,004
50-54	5	6,269
55-59	3	12,652
60-64	-	-
65-69	-	-
70-74	-	-
75-79	-	-
80-84	-	-
85-89	-	-
90-94	-	-
95-100	-	-
100 and over	-	-
Total	12	\$ 10,443

Basis for the Valuation

Inactive Benefit Information

Inactive Firefighters - Deferred Benefits

Disabled Retirees	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	\$ -
35-39	-	-	-
40-44	-	-	-
45-49	7	10,152	42,137
50-54	12	6,391	31,546
55-59	2	18,648	62,064
60-64	-	-	-
65-69	-	-	-
70-74	-	-	-
75-79	-	-	-
80-84	-	-	-
85-89	-	-	-
90-94	-	-	-
95-100	-	-	-
100 and over	-	-	-
Total	21	\$ 8,812	\$ 37,983

Basis for the Valuation

Inactive Benefit Information

Inactive Teachers - Current Benefits

Normal Retirees	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	-	\$ -	\$ -
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	-	-	-	-	-
50-54	-	-	7	9,442	45,744
55-59	-	-	62	15,017	52,753
60-64	2	22,320	298	19,878	53,641
65-69	10	14,946	752	27,629	53,390
70-74	82	29,874	1,201	35,833	53,259
75-79	252	46,083	746	38,064	51,531
80-84	461	49,785	240	37,141	48,461
85-89	441	45,892	55	42,754	54,075
90-94	253	43,255	7	33,302	45,345
95-100	101	47,107	2	44,544	58,488
100 and over	15	49,900	-	-	-
Total	1,617	\$ 45,699	3,370	\$ 32,854	\$ 52,573

Beneficiaries	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	1	\$ 7,080	3	\$ 2,928	\$ 6,840
35-39	-	-	-	-	-
40-44	-	-	2	7,476	15,936
45-49	3	8,136	-	-	-
50-54	1	2,064	1	10,272	12,804
55-59	4	12,984	6	11,232	26,136
60-64	3	24,652	12	13,419	21,695
65-69	7	20,638	25	14,514	21,058
70-74	32	22,082	33	15,400	20,347
75-79	56	21,890	31	12,794	16,974
80-84	49	25,298	8	13,863	17,756
85-89	59	24,143	4	10,695	17,505
90-94	42	24,020	1	29,232	31,380
95-100	24	25,651	1	16,068	19,848
100 and over	1	91,860	-	-	-
Total	282	\$ 23,464	127	\$ 13,615	\$ 19,447

Basis for the Valuation

Inactive Benefit Information

Inactive Teachers - Current Benefits

Disabled Retirees	100% Federal Count	100% Federal Average Benefit	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	-	\$ -	\$ -
35-39	-	-	-	-	-
40-44	-	-	-	-	-
45-49	-	-	-	-	-
50-54	-	-	-	-	-
55-59	4	23,241	-	-	-
60-64	3	22,584	10	13,422	36,353
65-69	4	29,406	24	16,433	36,081
70-74	35	29,483	29	19,451	35,953
75-79	32	28,719	4	24,141	31,617
80-84	40	32,033	-	-	-
85-89	22	30,821	-	-	-
90-94	15	38,505	-	-	-
95-100	13	41,706	-	-	-
100 and over	4	39,036	-	-	-
Total	172	\$ 31,770	67	\$ 17,750	\$ 35,800

Inactive Teachers - Deferred Benefits

Terminated Vested	Count	Average Federal Benefit
Under 35	-	\$ -
35-39	-	-
40-44	3	1,456
45-49	23	4,075
50-54	30	5,965
55-59	48	8,041
60-64	32	11,533
65-69	16	8,917
70-74	-	-
75-79	-	-
80-84	-	-
85-89	1	12,696
90-94	-	-
95-100	-	-
100 and over	-	-
Total	153	\$ 7,761

Basis for the Valuation

Inactive Benefit Information

Inactive Teachers - Deferred Benefits

Disabled Retirees	Partial Federal Count	Partial Federal Average Benefit	Partial Federal Average Total Benefit
Under 35	-	\$ -	\$ -
35-39	-	-	-
40-44	-	-	-
45-49	1	6,180	38,520
50-54	2	3,474	25,770
55-59	11	9,812	39,204
60-64	7	8,559	34,046
65-69	-	-	-
70-74	-	-	-
75-79	-	-	-
80-84	-	-	-
85-89	-	-	-
90-94	-	-	-
95-100	-	-	-
100 and over	-	-	-
Total	21	\$ 8,618	\$ 36,173

Basis for the Valuation

Inactive Benefit Information

Inactive Judges

Normal Retirees	Count	Average Benefit
Under 35	-	\$ -
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	-
55-59	1	166,541
60-64	7	165,162
65-69	13	147,050
70-74	22	148,669
75-79	11	152,614
80-84	13	161,673
85-89	9	140,495
90-94	3	79,305
95-100	-	-
100 and over	-	-
Total	79	\$ 149,214

Beneficiaries	Count	Average Benefit
Under 35	-	\$ -
35-39	-	-
40-44	-	-
45-49	-	-
50-54	1	6,190
55-59	-	-
60-64	-	-
65-69	-	-
70-74	2	102,380
75-79	1	97,441
80-84	3	76,438
85-89	2	62,067
90-94	3	75,904
95-100	2	62,345
100 and over	-	-
Total	14	\$ 72,446

Disabled Retirees	Count	Average Benefit
Under 35	-	\$ -
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	-
55-59	-	-
60-64	1	140,946
65-69	-	-
70-74	-	-
75-79	-	-
80-84	-	-
85-89	-	-
90-94	-	-
95-100	-	-
100 and over	-	-
Total	1	\$ 140,946

Terminated Vested	Count	Average Benefit
Under 35	-	\$ -
35-39	-	-
40-44	-	-
45-49	-	-
50-54	-	-
55-59	-	-
60-64	-	-
65-69	-	-
70-74	-	-
75-79	-	-
80-84	-	-
85-89	-	-
90-94	-	-
95-100	-	-
100 and over	-	-
Total	-	\$ -

APPENDIX A

Actuarial Assumptions and Methods

Methods

Liability Valuation Method

The funding method is the individual entry age normal method. The individual entry age normal method allocates the actuarial present value of the projected benefits of each individual on a level basis over the service of the individual between participation age and projected exit age.

The present value of future benefits is equal to the value of the projected benefit payable at retirement discounted back to the plan member's current age. Discounts include such items as interest and mortality. The difference between the present value of future benefits and the present value of future normal cost contributions represents the actuarial liability at the plan member's current age (for Police Officers and Firefighters' and Teachers' Plans, the benefits were fully accrued at June 30, 1997, therefore there is no normal cost). When assets are subtracted from the actuarial liability, the remainder represents the unfunded liability.

For the purposes of determining the actuarial gains and losses during the year, liabilities as of October 1, 2018 for the Police Officers and Firefighters' and Teachers' Plans are based on 2018 spot rates implied by the 2017 spot rate yield curve. These spot rates used in gain/loss analysis were calculated by converting the 2017 spot rates to forward rates, removing the forward rate for FY 2018, and then converting the forward rates back to spot rates. See the table below for an example of the rates.

Fiscal Year	2017 Valuation Spot Rate Assumption	Forward Rate (rounded)	Implied 2018 Spot Rates used for (Gain)/Loss only
FY 2018	0.71%	0.71%	N/A
FY 2019	0.94%	1.17%	1.17%
FY 2020	1.22%	1.78%	1.48%
FY 2021	1.53%	2.47%	1.80%

Example: 1.80% adjusted FY 2020 spot rate = $(1.0117 \times 1.0178 \times 1.0247)^{(1/3)} - 1$

Asset Valuation Method

The market value of assets projected to September 30, 2018 without smoothing is provided by ODCP and used for purposes of the valuation.

Funding Method

Under the individual entry age normal method, the normal cost is calculated as a dollar amount using the full yield curve. The normal cost to the Department of the Treasury is the full amount, less expected employee contributions. Changes in actuarial assumptions, changes in plan provisions, and differences in actual experience compared to expected experience are reflected as part of the annual amount of gain or loss, which is a component of the total amortization of Unfunded Accrued Liability.

The prior amortization periods and payments are fixed from year-to-year. Because of this, the balances of prior amortization bases are recalculated each year to reflect changes in the underlying interest rates. New amortization payments due to (Gain)/Loss are recognized over a 10-year period, while those due to assumption changes are recognized over a period of 20 years.

For the Police Officers', Firefighters' and Teachers' Plan, the outstanding amortization bases are re-calculated each year using the new spot rates. For the Judges' Plan, the outstanding amortization bases are re-calculated each year at the new funding effective interest rate (EIR).

The asset (Gain)/Loss is determined using the same interest rates as the liability (Gain)/Loss.

Mortality Adjustment from Census Date to Valuation Date

The census data is adjusted from the date it is provided to the valuation date. A factor is applied to the liabilities calculated using the census data to account for the estimated mortality between the census date and the valuation date.

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Actuarial Assumptions and Methods

Methods

Procedures

Financial and Census data were submitted by the Department of the Treasury. Information provided was reviewed for internal consistency and there is no reason to doubt its substantial accuracy.

No benefits of materiality were excluded from the valuation of the liabilities.

The Department of the Treasury provided us with data on actives who, as of the valuation date, had completed the plan's eligibility requirements.

Method Changes Since Last Year

None.

APPENDIX A

Actuarial Assumptions and Methods

Assumptions

Interest Rates

The June 30, 2018 rates (averaged over 40 quarters, as published by the Department of the Treasury) shown below were used for the current valuation. The Police Officers and Firefighters', and Teachers' Plans are measured using the full yield curve for the liability interest rate, while the Judges' Plan is measured using the equivalent Effective Interest Rate (EIR).

Duration	Return	Duration	Return	Duration	Return	Duration	Return
0-1	0.59%	25-26	3.55%	50-51	3.77%	75-76	3.85%
1-2	0.82%	26-27	3.57%	51-52	3.78%	76-77	3.85%
2-3	1.11%	27-28	3.58%	52-53	3.78%	77-78	3.85%
3-4	1.41%	28-29	3.60%	53-54	3.79%	78-79	3.86%
4-5	1.70%	29-30	3.61%	54-55	3.79%	79-80	3.86%
5-6	1.96%	30-31	3.62%	55-56	3.79%	80-81	3.86%
6-7	2.20%	31-32	3.64%	56-57	3.80%	81-82	3.86%
7-8	2.41%	32-33	3.65%	57-58	3.80%	82-83	3.86%
8-9	2.58%	33-34	3.66%	58-59	3.81%	83-84	3.87%
9-10	2.74%	34-35	3.67%	59-60	3.81%	84-85	3.87%
10-11	2.87%	35-36	3.68%	60-61	3.81%	85-86	3.87%
11-12	2.98%	36-37	3.69%	61-62	3.82%	86-87	3.87%
12-13	3.07%	37-38	3.70%	62-63	3.82%	87-88	3.87%
13-14	3.15%	38-39	3.70%	63-64	3.82%	88-89	3.87%
14-15	3.21%	39-40	3.71%	64-65	3.82%	89-90	3.87%
15-16	3.27%	40-41	3.72%	65-66	3.83%	90-91	3.88%
16-17	3.31%	41-42	3.72%	66-67	3.83%	91-92	3.88%
17-18	3.35%	42-43	3.73%	67-68	3.83%	92-93	3.88%
18-19	3.38%	43-44	3.74%	68-69	3.83%	93-94	3.88%
19-20	3.41%	44-45	3.74%	69-70	3.84%	94-95	3.88%
20-21	3.44%	45-46	3.75%	70-71	3.84%	95-96	3.88%
21-22	3.47%	46-47	3.76%	71-72	3.84%	96-97	3.89%
22-23	3.49%	47-48	3.76%	72-73	3.84%	97-98	3.89%
23-24	3.51%	48-49	3.76%	73-74	3.85%	98-99	3.89%
24-25	3.53%	49-50	3.77%	74-75	3.85%	99-100	3.89%

The Effective Interest Rates (single rate that produces the same results when applied to all cash flows) for all plans are as follows:

	Police	Fire	Teachers	Judges
EIR	3.12%	3.10%	3.00%	3.23%

Interest Rates for (Gain)/Loss

The same interest rates were used for purposes of rolling forward plan assets and rolling forward plan liabilities for determining gains and losses. For Judges, the EIR (3.42%) was used for this purpose. For Police, Fire and Teachers, the first spot rate from the 2017 spot rate curve (0.71%) was used for this purpose.

Economic Assumptions

	Police	Fire	Teachers	Judges
COLA ¹	1.62%	1.62%	1.64%	1.66%
Wage Inflation	1.80%	2.20%	2.36% ²	0.97%

¹The Cost-of-Living Adjustment (COLA) assumption above does not apply to police officers and firefighters who retired prior to February 15, 1980, as they receive COLAs based on wage inflation.

²The wage inflation assumption for the Teachers was set to 2.00% in FY 2019 to reflect the most recent contract negotiation.

APPENDIX A

Actuarial Assumptions and Methods

Assumptions

<p>Salary Growth</p>	<p>The additional salary increases (on top of the general wage increases for all actives as shown in the above table) are shown below, via representative rates:</p> <table border="1" data-bbox="473 409 1591 625"> <thead> <tr> <th>Years of Service</th> <th>Police</th> <th>Fire</th> <th>Teachers</th> <th>Judges</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>3.00%</td> <td>3.00%</td> <td>2.00%</td> <td>0.00%</td> </tr> <tr> <td>15</td> <td>2.10%</td> <td>7.36%</td> <td>1.60%</td> <td>0.00%</td> </tr> <tr> <td>20</td> <td>8.80%</td> <td>4.70%</td> <td>0.75%</td> <td>0.00%</td> </tr> <tr> <td>25</td> <td>3.60%</td> <td>3.75%</td> <td>0.60%</td> <td>0.00%</td> </tr> <tr> <td>30</td> <td>3.35%</td> <td>7.90%</td> <td>0.40%</td> <td>0.00%</td> </tr> </tbody> </table> <p>Police officers receive longevity increases of 5% of step 1 pay in the officers' pay class after 15 years of service and additional increases of 5% of step 1 pay in the officers' pay class after 20, 25 and 30 years of service. Longevity pay is included in pensionable compensation once the member has 25 years of service. Police officers receive an additional increase of 5% of base pay for the Base Retention Differential after 20 years of service.</p> <p>Firefighters are assumed to receive longevity increases of 5%, 10%, 15%, and 20% applied to base pay after 15, 20, 25, and 30 years of service, respectively, and are included in pensionable compensation for all years.</p>	Years of Service	Police	Fire	Teachers	Judges	10	3.00%	3.00%	2.00%	0.00%	15	2.10%	7.36%	1.60%	0.00%	20	8.80%	4.70%	0.75%	0.00%	25	3.60%	3.75%	0.60%	0.00%	30	3.35%	7.90%	0.40%	0.00%
Years of Service	Police	Fire	Teachers	Judges																											
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<p>Active Plan Member Base Mortality</p>	<ul style="list-style-type: none"> • Police Officers and Firefighters: 80% of RP-2000 Combined Healthy mortality with Blue Collar Adjustment with a 1-year setback for males and no setback for females. • Teachers: 80% of RP-2000 Combined Healthy mortality with White Collar Adjustment with a 4-year setback for males and a 3-year setback for females. • Judges: RP-2014 Non-Annuitant mortality with White Collar Adjustment, with no setbacks. 																														
<p>Inactive Plan Member Base Mortality</p>	<ul style="list-style-type: none"> • Police Officers and Firefighters: RP-2000 Combined Healthy mortality with Blue Collar Adjustment with a 1-year setback for males and no setback for females. • Teachers: RP-2000 Combined Healthy mortality with White Collar Adjustment with a 4-year setback for males and a 3-year setback for females. • Judges: RP-2014 Annuitant mortality with White Collar Adjustment, with no setbacks. For periods of deferral, RP-2014 Non-Annuitant mortality with White Collar Adjustment, with no setbacks. 																														

APPENDIX A

Actuarial Assumptions and Methods

Assumptions

Disabled Plan Member Base Mortality	<ul style="list-style-type: none"> • Police Officers and Firefighters: RP-2000 Combined Healthy mortality with Blue Collar Adjustment with no set forward for males and a 1-year set forward for females. • Teachers: RP-2000 Combined Healthy mortality with White Collar Adjustment with a 1-year set forward for males and a 2-year set forward for females. • Judges: RP-2014 Annuitant mortality with White Collar Adjustment, with no setbacks. 																																													
Longevity Improvement Projection Scale	<ul style="list-style-type: none"> • Police Officers, Firefighters and Teachers: Mortality tables are adjusted using generational projection from 2011 using Scale MP-2017. • Judges: Longevity improvements are removed from 2014 to 2006 using scale MP-2014. Then, mortality tables are adjusted using generational projection from 2006 using Scale MP-2017. 																																													
Mortality Adjustment from Census Date to Valuation Date	<p>The liabilities are adjusted to account for mortality during the 5 month period between the census collection date of May 1, 2018 and the valuation date of October 1, 2018. The liabilities for inactive plan members in the Police Officers and Firefighters', and Teachers' plans are decreased by 0.1225% per month (0.993875 factor applied), while the liabilities for inactive plan members in the Judges' plan are reduced by 0.1900% per month (0.9905 factor applied). The liabilities for active plan members are unadjusted.</p>																																													
Disability	<p>No disabilities are assumed among Judges.</p> <p>Below are sample rates of disability assumed to occur:</p> <table border="1" data-bbox="476 1257 1585 1536"> <thead> <tr> <th>Age</th> <th>Police</th> <th>Fire</th> <th>Teachers</th> <th>Judges</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>0.900%</td> <td>0.750%</td> <td>0.070%</td> <td>0.000%</td> </tr> <tr> <td>35</td> <td>0.900%</td> <td>0.750%</td> <td>0.120%</td> <td>0.000%</td> </tr> <tr> <td>40</td> <td>0.405%</td> <td>0.375%</td> <td>0.128%</td> <td>0.000%</td> </tr> <tr> <td>45</td> <td>0.405%</td> <td>0.375%</td> <td>0.208%</td> <td>0.000%</td> </tr> <tr> <td>50</td> <td>0.405%</td> <td>0.375%</td> <td>0.500%</td> <td>0.000%</td> </tr> <tr> <td>55</td> <td>0.000%</td> <td>0.000%</td> <td>0.800%</td> <td>0.000%</td> </tr> <tr> <td>59</td> <td>0.000%</td> <td>0.000%</td> <td>0.800%</td> <td>0.000%</td> </tr> <tr> <td>60</td> <td>0.000%</td> <td>0.000%</td> <td>0.000%</td> <td>0.000%</td> </tr> </tbody> </table> <p>Note that the Federal portion of the disability benefits for police officers and firefighters is the same for service and non-service related disabilities. Therefore, an assumption on percentage of service related disabilities was not necessary. All incidents of disability were assumed to result in plan members being 100% disabled.</p>	Age	Police	Fire	Teachers	Judges	30	0.900%	0.750%	0.070%	0.000%	35	0.900%	0.750%	0.120%	0.000%	40	0.405%	0.375%	0.128%	0.000%	45	0.405%	0.375%	0.208%	0.000%	50	0.405%	0.375%	0.500%	0.000%	55	0.000%	0.000%	0.800%	0.000%	59	0.000%	0.000%	0.800%	0.000%	60	0.000%	0.000%	0.000%	0.000%
Age	Police	Fire	Teachers	Judges																																										
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APPENDIX A

Actuarial Assumptions and Methods

Assumptions

Withdrawal

No terminations are assumed among judges and termination rates are not applied to plan members eligible for service retirement.

Below are sample termination rates:

Age	Police	Fire	Teachers- Male	Teachers- Female	Judges
30	1.600%	1.500%	15.830%	7.920%	0.000%
35	1.600%	1.250%	13.700%	6.850%	0.000%
40	0.900%	1.000%	13.500%	6.760%	0.000%
45	0.900%	0.750%	10.120%	5.060%	0.000%
50	0.900%	0.500%	6.070%	3.040%	0.000%
55	0.900%	0.250%	3.600%	2.160%	0.000%
60	0.000%	0.000%	3.600%	2.160%	0.000%
62+	0.000%	0.000%	0.000%	0.000%	0.000%

70% of terminations are assumed to result in the withdrawal of contributions, with no further benefits payable. All other plan members are assumed to receive deferred benefits.

Retirement Age

Retirement is assumed to occur in accordance with the tables below:

Age	Police- Male	Police- Female	Fire	Teachers	Judges
45-49	10%	10%	10%	0%	0%
50	40%	40%	15%	0%	0%
51	25%	30%	17%	0%	0%
52	25%	30%	19%	0%	0%
53	25%	30%	21%	0%	0%
54	25%	30%	23%	0%	0%
55	25%	30%	25%	35%	0%
56	22%	30%	27%	35%	0%
57	22%	31%	29%	35%	0%
58	22%	32%	31%	35%	10%
59	22%	33%	33%	35%	10%
60-62	100%	100%	100%	25%	10%
63-69	100%	100%	100%	25%	10%
70+	100%	100%	100%	100%	100%

An additional 15% for Firefighters ages 50-59 with at least 30 years of service is assumed.

Return of Employee Contributions

In valuing return of contribution benefits for employees assumed to die without a spouse or to terminate and elect a refund of their contribution balance, the employee contributions balance was estimated based on the actual employee contribution balance when available (provided as of the census date for the Judges' plan and July 1, 1998 for the other plans), otherwise using estimated prior salaries.

Post Retirement Contributions

Retired Judges may elect to contribute 3.5% of their retirement benefit to provide a survivor benefit. The net amount of this benefit was included in benefit payments and projections, and the normal cost was not offset by these contributions.

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Assumptions

Expenses	The 15-Year Fund projections for all plans use expense projections provided by the Department of the Treasury. The 15-Year Fund projections for the Judges' Plan assumes employee contribution increases at the same rate as pay for actives.
Percent Married	For the purpose of active death benefits, 50% of teachers and 70% of police officers and firefighters are assumed to be married during employment and after retirement. Male spouses are assumed to be three years older than their female spouse when actual beneficiary data was unavailable.
Benefit Form Election	<ul style="list-style-type: none">• Police Officers and Firefighters: All married plan members receive a Joint-and-57% Survivor Annuity, and all single plan members receive a Single Life Annuity. Any additional survivor benefit for police officers and firefighters whose average pay was less than class 1, step 6 pay was not valued.• Teachers: 100% of active and terminated vested plan members were valued assuming benefits are payable as a Single Life Annuity. For retirees, 50% were assumed to elect a Joint-and-55% Survivor Annuity, and 50% to elect a Straight Life Annuity.• Judges: Judges who have elected survivor benefits are assumed to have a covered spouse with a Joint-and-55% Survivor Annuity. All others assumed to have a Single Life Annuity.
Open Group Projections for Judges	All active judges were assumed to be replaced upon termination from the plan. The replacement is based on a 50/50 blend of a new age 45 judge and a new age 55 judge, assuming 50% male and 50% female. The starting salary is assumed to be \$208,000 for all new entrants.
Data	This actuarial valuation has been prepared based upon plan member data provided by the Department of the Treasury. We have reviewed the data for reasonableness, but have not independently audited the data. We have no reason to believe the data is not complete and accurate, and know of no further information that is essential to the preparation of the actuarial valuation.

APPENDIX A

Actuarial Assumptions and Methods

Assumptions

Changes from Prior Report

Longevity Improvement Projection Scale

The mortality projection scale for all plans was updated from Scale MP-2016 to Scale MP-2017.

Interest Rate

The interest rate assumption was changed to reflect average quarterly Treasury yield rates for the 10-year period ending on June 30, 2018. The June 30, 2017 rates (averaged over 40 quarters, as published by the Department of the Treasury) shown below were used for the prior valuation of the Police Officers and Firefighters', and Teachers' Plans. The prior year EIR for the Judges' Plan was 3.42%.

Duration	Return	Duration	Return	Duration	Return	Duration	Return
0-1	0.71%	25-26	3.72%	50-51	3.93%	75-76	4.00%
1-2	0.94%	26-27	3.74%	51-52	3.93%	76-77	4.00%
2-3	1.22%	27-28	3.75%	52-53	3.93%	77-78	4.00%
3-4	1.53%	28-29	3.76%	53-54	3.94%	78-79	4.00%
4-5	1.82%	29-30	3.77%	54-55	3.94%	79-80	4.00%
5-6	2.10%	30-31	3.79%	55-56	3.94%	80-81	4.01%
6-7	2.34%	31-32	3.80%	56-57	3.95%	81-82	4.01%
7-8	2.57%	32-33	3.81%	57-58	3.95%	82-83	4.01%
8-9	2.76%	33-34	3.82%	58-59	3.95%	83-84	4.01%
9-10	2.92%	34-35	3.83%	59-60	3.96%	84-85	4.01%
10-11	3.06%	35-36	3.84%	60-61	3.96%	85-86	4.01%
11-12	3.18%	36-37	3.84%	61-62	3.96%	86-87	4.02%
12-13	3.27%	37-38	3.85%	62-63	3.97%	87-88	4.02%
13-14	3.35%	38-39	3.86%	63-64	3.97%	88-89	4.02%
14-15	3.42%	39-40	3.87%	64-65	3.97%	89-90	4.02%
15-16	3.47%	40-41	3.87%	65-66	3.97%	90-91	4.02%
16-17	3.52%	41-42	3.88%	66-67	3.98%	91-92	4.02%
17-18	3.56%	42-43	3.88%	67-68	3.98%	92-93	4.02%
18-19	3.59%	43-44	3.89%	68-69	3.98%	93-94	4.02%
19-20	3.62%	44-45	3.90%	69-70	3.98%	94-95	4.03%
20-21	3.64%	45-46	3.90%	70-71	3.99%	95-96	4.03%
21-22	3.66%	46-47	3.91%	71-72	3.99%	96-97	4.03%
22-23	3.68%	47-48	3.91%	72-73	3.99%	97-98	4.03%
23-24	3.70%	48-49	3.92%	73-74	3.99%	98-99	4.03%
24-25	3.71%	49-50	3.92%	74-75	3.99%	99-100	4.03%

COLA/Wage Inflation

	Police	Fire	Teachers	Judges
<u>Prior Year</u>				
COLA	1.82%	1.82%	1.86%	1.69%
Wage Inflation	1.80%	2.20%	3.00%	1.08%
<u>Current Year</u>				
COLA	1.62%	1.62%	1.64%	1.66%
Wage Inflation	1.80% ¹	2.20% ¹	2.36%	0.97%

¹ Unchanged from prior report

APPENDIX B

Rationale Methods

Funding Method	SFFAS 5 permits the use of a funding method other than the Aggregate Entry Age Normal method if an explanation is provided and the difference in results are immaterial. Under the Aggregate Entry Age Normal method for Civil Service plans, the normal cost rate is calculated for new actives using the ratio of present value of benefits to present value of future salaries. The Police Officers and Firefighters' and the Teachers' Plans do not have a normal cost because the service is frozen; therefore, both the Individual and the Aggregate Entry Age Normal methods produce the same results. The Judges' plan has a normal cost due to continued accrual, but the results are similar under either method. Because the aggregate method creates unnecessary amortization bases and because the individual method is consistent with past practice as directed by the Department of the Treasury, the Individual Entry Age Normal method was applied.
Interest Rate Application	To calculate the present value of plan members' benefits for the Police Officers and Firefighters', and Teachers' Plans, spot rates were used in accordance with SFFAS 5 and SFFAS 33. For the Judges' Plan, an Effective Interest Rate (EIR) was used. The EIR is the single interest rate calculated to provide the same present value of benefits as the spot rates and allows for the appropriate liability calculation using the Entry Age Normal Funding Method with an active population.

APPENDIX B

Rationale

Assumptions

Interest Rates and Economic Assumptions	The underlying interest rate, inflation, Cost-of-Living Adjustment (based on 10-year averages), and wage inflation assumptions (based on the 10-year average of actual negotiated pay increases) were prescribed by the Department of the Treasury, based on their analysis of investments and historical experience, and are intended to comply with SFFAS 5 and 33.
Interest Rates for (Gain)/Loss	The use of EIR for the Judges' Plan produced the same Present Value of Benefits as is produced using the yield curve. For an active plan, the EIR is used for the period of time between plan member entry and the valuation date. The EIR is a good proxy for long term discount rate because it captures the weighted cash flows of the yield curve as a single rate. The use of the first spot rate for the other plans reflects the most relevant expectation of the discount rate over the course of the prior year.
Salary Growth	The underlying salary growth assumptions are based upon expectations of plan experience and the most recent experience study conducted in 2014.
Base Mortality Table	<ul style="list-style-type: none"> • Police Officers, Firefighters and Teachers: The base mortality tables were adjusted to reflect actual plan experience during the most recent experience study conducted in 2014. • Judges: The RP-2014 base mortality table reflects the most recently developed mortality base table published by the Society of Actuaries, reflecting the White Collar nature of the plan participants.
Longevity Improvement Projection Scale	The MP-2017 projection scale reflects the most recently developed mortality improvement outlook from the Society of Actuaries.
Mortality Adjustment from Census Date to Valuation Date	The adjustment to the liability to account for assumed mortality experience during the gap between the census collection date and the valuation date is a de minimis assumption.
Disability Rates	Rates of disablement for included actives are based upon expectations of plan experience and the most recent experience study conducted in 2014.
Withdrawal Rates	Rates of withdrawal for included actives are based upon broad termination patterns and expectations of plan experience and the most recent experience study conducted in 2014.
Retirement Rates	Rates of retirement for included actives are based upon broad retirement patterns and expectations of plan experience and the most recent experience study conducted in 2014.
Expenses	The 15-Year Fund projections for all plans use expense projections provided by the Department of the Treasury. Due to the active nature of the Judges' Plan, employee contributions have a further increase factor to account for increases in pay rate for actives.

APPENDIX B

Rationale

Assumptions

Percent Married	The marriage assumptions are based on expectations of plan experience and the most recent experience study conducted in 2014.
Benefit Form Election	The benefit form election assumptions are based on expectations of plan experience and the most recent experience study conducted in 2014.
Open Group Projections	Open group projections are based upon expectations of plan experience.
Benefits Not Valued	<p>The refund of unexpended employee contributions was not valued for the Police Officers and Firefighters' and the Teachers' Plans payable to retirees who died without eligible surviving beneficiaries. The Department of the Treasury is only responsible for the balance as of June 30, 1997 without interest; therefore, this liability, if any, was deemed immaterial.</p> <p>Survivor benefits for the Teachers' Plan are not valued for deferred benefits. The Teachers plan provides a reduction for Joint-and-Survivor benefits; therefore, the actuarial value of the life annuity is similar to the actuarial value of the Joint-and-Survivor annuity. Surviving children's benefits for active plan members in the Police Officers and Firefighters' Plan are valued indirectly, by assuming a Joint-and-57% Survivor annuity for married plan members.</p> <p>The COLA for surviving spouses in the Police Officers and Firefighters' Plan who retired prior to February 15, 1980 is based on the Consumer Price Index (CPI). Due to the complexity of the calculation and immaterial impact on the liabilities, the same COLA that applies to the plan member was assumed to apply to the spouse.</p>

APPENDIX C

Plan Provisions Summary Police Officers and Firefighters' Plan

Plan Year	October 1 - September 30
Eligibility for Participation	All police officers and firefighters of the District of Columbia automatically become plan members on their date of employment. Police Cadets are not eligible.
Contributions	<p>Plan members hired before November 10, 1996 are required to contribute 7% of annual salary, including any differential for special assignment, but excluding overtime, longevity, holiday, or military pay. Plan members hired on or after November 10, 1996 contribute 8% of annual salary, including any differential for special assignment, but excluding overtime, holiday, or military pay. Interest is not credited to each plan member's accumulated contributions.</p> <p>Emerging inactive plan members not eligible for additional benefits will receive a refund of their contributions.</p>
Departmental Service	A plan member receives service for each full year and additional months of employment with either the Metropolitan Police Force or the D.C. Fire Department. Only service earned prior to July 1, 1997 is used to compute the plan benefits.
Credited Service	Service granted or purchased in addition to departmental service.
Final Average Annual Earnings	For those hired before February 15, 1980, basic pay for the highest 12 consecutive months. For those hired on or after February 15, 1980, basic pay for the highest 36 consecutive months divided by three.
Longevity Pay - Police Officers	<p>Plan members who complete 25 years of active service prior to retirement are entitled to have longevity pay included in pensionable compensation.</p> <p>Plan members hired before February 15, 1980, who complete 20 but less than 25 years of active service prior to retirement, are entitled to have longevity pay included in pensionable compensation (as this benefit adjustment was not included in June 30, 1997 plan provisions governing federal benefits, the District funds this benefit adjustment).</p>
Normal form of benefit	Straight Life Annuity (no eligible spouse survivor); Joint-and-Survivor Annuity (eligible spouse survivor)
Optional form of benefit	<p>Optional Additional Survivor Benefit:</p> <p>If elected by the plan member, the retiree benefit is reduced by 10% and the survivor is entitled to an additional survivor benefit equal to the amount of the benefit reduction; except the additional survivor benefit is reduced by 5% for each full five years the survivor is younger than the plan member, with this reduction not to exceed 40%.</p>

APPENDIX C

Plan Provisions Summary Police Officers and Firefighters' Plan

Cost-of-Living Adjustments	<p>Former employees (not beneficiaries) who retired prior to February 15, 1980, receive equalization, defined as a percentage increase in benefits equal to the percentage increase in pay active employees receive.</p> <p>All other retired plan members and their survivors receive an increase April 1 each year based on the annual change in the Consumer Price Index (All Urban Consumers) from December to December. The annual increase will not be less than 0% for any plan member, and is limited to a maximum of 3% for plan members hired on or after November 10, 1996.</p> <p>The cost-of-living adjustment for plan members disabled after June 30, 1997 and not eligible for an optional retirement benefit starts only with the payment of the Federal portion of the benefit at age 55.</p>
<u>Retirement Benefits</u>	
Optional Retirement Date	<p>For plan members hired before November 10, 1996:</p> <ul style="list-style-type: none">• Age 60; or• Age 50 with 25 years of departmental service; or• No age requirement with 20 years of service (only if hired before February 15, 1980.) <p>For plan members hired on or after November 10, 1996:</p> <ul style="list-style-type: none">• Age 60; or• No age requirement with 25 years of service.
Optional Retirement Benefit	<p>For plan members hired before November 10, 1996:</p> <ul style="list-style-type: none">• 2.5% of Average Pay times departmental service up to 25 years (20 years if hired before February 15, 1980), plus• 3.0% of Average Pay times departmental service over 25 (or 20) years, plus• 2.5% of Average Pay times credited service. <p>For plan members hired on or after November 10, 1996:</p> <ul style="list-style-type: none">• 2.5% of Average Pay times total service. <p>For all plan members, there is a maximum benefit of 80% of Average Pay. Service after June 30, 1997 is excluded from the calculation of the Federal portion of the benefit.</p>
Vesting	5 years of departmental service.
Deferred Vested Benefit	Optional Retirement Benefit beginning at age 55.

APPENDIX C

Plan Provisions Summary Police Officers and Firefighters' Plan

Disability Benefits	
Service-Related Disability Benefit Eligibility	Plan members who are disabled as a result of an illness or injury in the line of duty are eligible for this benefit. If disabled after June 30, 1997 and not eligible for an optional retirement benefit, the Federal portion of this benefit is payable beginning at age 55.
Service-Related Disability Benefit	<p>For plan members hired before February 15, 1980, 2.5% of Average Pay times total years of service, subject to a minimum benefit of 66-2/3% of Average Pay and subject to a maximum benefit of 70% of Average Pay.</p> <p>For plan members hired on or after February 15, 1980, 70% of final pay times percentage of disability, subject to a minimum benefit of 40% of final pay.</p> <p>The Federal portion of this benefit is a deferred vested benefit payable upon attainment of age 55, unless the conditions for optional retirement are met, in which case the Federal portion of this benefit is an optional retirement benefit. Service after June 30, 1997 is excluded from this calculation.</p>
Non-Service-Related Disability Benefit Eligibility	Eligible with 5 years of departmental service and a physical or mental disability that prevents the plan member from performing his/her job. If disabled after June 30, 1997 and not eligible for an optional retirement benefit, the Federal portion of this benefit is payable beginning at age 55.
Non-Service-Related Disability Benefit	<p>For plan members hired before February 15, 1980, 2.0% of Average Pay times total years of service, subject to a minimum benefit of 40% of Average Pay and subject to a maximum benefit of 70% of Average Pay.</p> <p>For plan members hired on or after February 15, 1980, 70% of Final Pay times percentage of disability, subject to a minimum benefit of 30% of Final Pay.</p> <p>The Federal portion of this benefit is a deferred vested benefit payable upon attainment of age 55, unless the conditions for optional retirement are met, in which case the Federal portion of this benefit is an optional retirement benefit. Service after June 30, 1997 is excluded from this calculation.</p>

APPENDIX C

Plan Provisions Summary Police Officers and Firefighters' Plan

Death Benefits	
Lump Sum Death Benefit	Lump sum of \$50,000 payable for death occurring in the line of duty, provided the death is not the result of willful misconduct or by intention to bring about his/her own death.
Survivor Benefit (Spouse Only) - Death Outside Line of Duty after 12/29/93	Eligible upon death and, if retired, married for at least one year or have a child by the marriage. The benefit will be 40% of the greater of Average Pay and the salary for class 1, step 6 of the D.C. Police and Fireman's Salary Act in effect at the date of death, adjusted for cost-of-living increases if death occurs after retirement. The benefit cannot exceed the rate of pay for the position occupied at death (or retirement if death occurs after retirement.)
Survivor Benefit (Spouse Only) - Death In Line of Duty after 12/29/93	Eligible upon death in the line of duty. The benefit will be 100% of final pay. The Federal portion of this benefit is 40% of average pay per June 30, 1997 plan provisions.
Survivor Benefit - Spouse and Dependent Children	<p>Eligibility for the spouse is the same as Spouse Only benefit; for the children, unmarried and under 18 (22 if full-time student), or any child dependent because of a disability incurred before age 18.</p> <p>Spouse benefit as described above, plus, provided death does not occur in the line of duty, a benefit per child (payable until the children are no longer eligible) equal to the smallest of:</p> <ul style="list-style-type: none"> • 60% of Average Pay divided by the number of eligible children; • \$4,164 (\$4,080 if hired on or after November 1, 1996) - Federal portion is \$1,548; or • \$12,492 (\$12,240 if hired on or after November 1, 1996) divided by the number of children - Federal portion is \$4,644. <p>These amounts are increased annually based on cost-of-living adjustments.</p>
Survivor Benefit - Dependent Children Only	Eligibility is same as the Dependent Children benefit above. The benefit will be 75% of Average Pay divided by the number of eligible children, adjusted for cost-of-living increases.
Refund of Contributions	Refund contributions if death before retirement and no eligible spouse or children. All plan member contributions will be refunded to a named, or statutorily-designated if none named, beneficiary.
Changes Since Prior Valuation	None of which we are aware.

APPENDIX C

Plan Provisions Summary

Teachers' Plan

Plan Year	October 1 - September 30
Eligibility for Participation	Permanent, temporary, and probationary teachers for the District of Columbia public day schools become plan members automatically on their date of employment. Other employees covered by the Retirement of Public School Teachers Act – including librarians, principals, and counselors – also become plan members on their date of employment. Substitute teachers and employees of the Department of School Attendance and Work Permits are not covered. Some former D.C. teachers working at charter schools are eligible to remain in the Plan.
Contributions	Plan members hired before November 1, 1996 are required to contribute 7% of annual pay. Plan members hired on or after November 1, 1996 contribute 8% of annual pay. Emerging inactive plan members not eligible for additional benefits will receive a refund of their contributions without interest.
School Service	One year of school service is granted for each year of employment with the D.C. public day schools.
Credited Service	Service granted or purchased in addition to school service.
Final Average Annual Earnings	Highest 36 consecutive months of pay, divided by three.
Optional forms of benefit	<p><u>Reduced Annuity with a Maximum Survivor Annuity (to Spouse)</u> The original benefit is reduced by 2.5% of annual pension up to \$3,600, plus 10% of any amount over \$3,600. Spouse will receive 55% of Unreduced Annuity.</p> <p><u>Reduced Annuity with a Partial Survivor Annuity (to Spouse)</u> An annuity with a benefit payable to the spouse of between \$1 up to any amount less than 55% of the Unreduced Annuity. The original benefit is reduced by dividing the amount of the survivor's annuity by 55%, then reducing the original benefit by 2.5% of this amount up to \$3,600, plus 10% of any amount over \$3,600.</p> <p><u>Reduced Annuity with a Survivor Annuity to a Person with an Insurable Interest</u> A joint and 55% survivor annuity with the original benefit reduced 10% plus an additional 5% for each full 5 years, up to 25 years, the survivor is younger, with a total reduction of 40% for any survivor who is 25 or more years younger.</p> <p><u>Reduced Annuity with a Life Insurance Benefit</u> Benefits are reduced to provide a lump sum life insurance benefit to a designated beneficiary.</p>

APPENDIX C

Plan Provisions Summary

Teachers' Plan

Cost-of-Living Adjustments	All plan members receive an increase on April 1 each year based on the annual change in the Consumer Price Index (all items – U.S. City average) from December to December. The annual increase will not be less than 0% for any plan member, and is limited to 3.0% for plan members hired on or after November 1, 1996. The cost-of-living adjustment for plan members who become disabled after June 30, 1997 starts only with the payment of the federal portion of the benefit at age 62.
<u>Retirement Benefits</u>	
Voluntary Retirement Date	<p>For plan member hired before November 1, 1996, earliest of:</p> <ul style="list-style-type: none"> • Age 62 with 5 years of school service; • Age 60 with 20 years of total service, including 5 years of school service; • Age 55 with 30 years of total service, including 5 years of school service. <p>For plan member hired on or after November 1, 1996, earliest of:</p> <ul style="list-style-type: none"> • Age 62 with 5 years of school service; • Age 60 with 20 years of total service, including 5 years of school service; • Any age with 30 years of total service, including 5 years of school service.
Voluntary Retirement Benefit	<p>For plan member hired before November 1, 1996:</p> <ul style="list-style-type: none"> • 1.5% of Average Pay times service up to 5 years, plus; • 1.75% of Average Pay times service between 5 and 10 years, plus • 2.0% of Average Pay times service over 10 years. <p>For plan member hired on or after November 1, 1996:</p> <ul style="list-style-type: none"> • 2.0% of Average Pay times service. <p>For all plan members, there is a minimum benefit of 1.0% of Average Pay plus \$25 for each year of service.</p> <p>Service after June 30, 1997 is excluded from the calculation of the Federal portion of the benefit.</p>
Involuntary Retirement Date	<p>Retired involuntarily for reasons other than misconduct or delinquency with:</p> <ul style="list-style-type: none"> • 25 years of total service, including 5 years of school service; or • Age 50 with 20 years of total service, including 5 years of school service.
Involuntary Retirement Amount	Voluntary Retirement Benefit is reduced by 1/6% per month (2% per year) for each full month that the date of retirement precedes age 55.
Vesting	5 years of school service.
Deferred Vested Benefit	The benefit amount is calculated as a Voluntary Retirement Benefit beginning at age 62, based on service earned as of the termination of employment.

APPENDIX C

Plan Provisions Summary

Teachers' Plan

Disability Benefits	
Disability Benefit Eligibility	5 years of school service and a physical or mental disability that prevents the plan member from performing the job.
Disability Benefit	Voluntary Retirement benefit, subject to a minimum of the lesser of 40% of Average Pay and the benefit that the plan member would receive, projecting service to age 60. If disabled after June 30, 1997 and not eligible for voluntary retirement, the Federal portion of this benefit is a deferred vested benefit payable upon attainment of age 62. Service after June 30, 1997 is excluded from this calculation.
Death Benefits	
Lump Sum Death Benefit - No Survivor	Teachers who die before retirement and before completing 18 months of school service or who die without an eligible spouse, child, or parent, will receive a lump sum death benefit. The benefit will be a refund of plan member contributions without interest.
Survivor Benefit - Spouse Only	Teachers who die before retirement and were married for at least two years or have a child by the marriage will provide their survivors a benefit. The benefit will be 55% of the Voluntary Retirement benefit subject to minimums.
Survivor Benefit - Spouse and Dependent Children	<p>Eligibility for the spouse is the same as Spouse Only benefit; for the children, unmarried and under 18 (22 if a full-time student); or any child dependent because of a disability incurred before age 18. Death does not have to occur before retirement for the children's benefits. The benefit will be:</p> <p>Spouse benefit as described above, plus a benefit per child (payable until the children are no longer eligible) equal to the smallest of:</p> <ul style="list-style-type: none"> • 60% of Average Pay divided by the number of eligible children; • \$7,080 (if hired before January 1, 1980), \$6,840 (if hired between January 1, 1980 and October 31, 1996), or \$6,672 (if hired on or after November 1, 1996) per child; or • \$21,240 (if hired before January 1, 1980), \$20,520 (if hired between January 1, 1980 and October 31, 1996), or \$20,016 (if hired on or after November 1, 1996) divided by the number of children. <p>These amounts are increased annually based on cost-of-living adjustments.</p>

APPENDIX C

Plan Provisions Summary

Teachers' Plan

Survivor Benefit - Dependent Children Only	Eligibility is the same as for the children's benefit when there is a surviving spouse. Benefit Amount Per child (payable until the children are no longer eligible), the smallest of: <ul style="list-style-type: none">• 75% of Average Pay divided by the number of eligible children;• \$8,664 (if hired before January 1, 1980), \$8,340 (if hired between January 1, 1980 and October 31, 1996), or \$8,076 (if hired on or after November 1, 1996) per child;or• \$25,992 (if hired before January 1, 1980), \$25,020 (if hired between January 1, 1980 and October 31, 1996), or \$24,228 (if hired on or after November 1, 1996) divided by the number of children. These amounts are increased annually based on cost-of-living adjustments.
Survivor Benefit - Surviving Parents Only	Eligible if death before retirement and no eligible spouse or children, and parents receive at least one-half of their total income from the plan member. The benefit will be the same as the Surviving Spouse benefit.
Changes Since Prior Valuation	None of which we are aware.

APPENDIX C

Plan Provisions Summary

Judges' Plan

Plan Year	October 1 - September 30
Eligibility for Participation	All Judges of the District of Columbia Court of Appeals or the Superior Court are members in the Plan. The Executive Officer of the Court System is also eligible.
Contributions	All Judges contribute 3.5% of their salaries to the Fund. Judges electing survivor coverage pay an additional 3.5% of annual salary (or retirement benefit if retired). Plan member contributions for survivor coverage do not end at retirement. Emerging inactive plan members not eligible for additional benefits will receive a refund of their contributions without interest.
Judicial Service	A plan member receives credit for each full year and additional months of employment as a Judge with the District of Columbia Courts.
Credited Service	Service granted or purchased in addition to judicial service.
Cost-of-Living Adjustments	All pensioners will receive cost-of-living increases in line with those applicable to retirees in the Civil Service Retirement System. Cost-of-living adjustments are paid on January 1.
<u>Retirement Benefits</u>	
Regular Retirement Date	Earlier of: <ul style="list-style-type: none"> • Age 50 with 20 years of Judicial Service; or • Age 60 with 10 years of Judicial Service.
Regular Retirement Benefit	Basic salary at retirement times the ratio of Judicial Service to 30, plus An additional benefit for any Credited Service (non Judicial) as follows: <ul style="list-style-type: none"> • 1.50% of basic salary times Credited Service up to 5 years, plus • 1.75% of basic salary times Credited Service from 5 to 10 years, plus • 2.00% of basic salary times Credited Service in excess of 10 years. <p>The maximum total benefit is 80% of basic salary.</p>
Vesting	10 years of Judicial Service.

APPENDIX C

Plan Provisions Summary

Judges' Plan

Mandatory Retirement Date	Mandatory retirement is at age 74.
Early Retirement Eligibility	Age 55 with 10 years of Judicial Service.
Early Retirement Benefit	1/12% per month prior to age 60 reduction in Judicial Service benefit.
Deferred Vested Benefit	The deferred vested benefit is the same as the Early Retirement Benefit beginning at age 55 or the Regular Retirement Benefit beginning at age 60, but only reflecting service to the date of employment termination.
Disability Benefits	
Disability Benefit Eligibility	A plan member is eligible for disability retirement after 5 years of Judicial and Credited Service and becoming physically or mentally disabled to an extent that interferes with proper performance of judicial duties. No service requirement applies to involuntary disability retirement.
Disability Benefit	Regular Retirement Benefit, subject to a minimum of 50% of basic salary (if an involuntary disability retirement).
Death Benefits	
Survivor Benefit Eligibility	Judges who contribute an additional 3.5% of salary during their working career and during retirement will provide a survivor benefit to their surviving spouse and/or children. The judge must also have completed at least 5 years of Judicial and Credited Service, and have been married for 2 years or have a child by marriage. A refund of excess contributions, less benefits paid to the retiree, will be paid if there are no eligible survivors.
Survivor Benefit	<p>Spouse Benefit: If judge was retired, 55% of the benefit the judge was receiving. If judge was active, 55% of the benefit the judge would have received had the judge retired on the day prior to death, not less than 55% of the benefit that would be provided to a judge with 15 years of Judicial Service without adjustment for early retirement.</p> <p>Dependent Children Benefit: A benefit will be paid to the children under the age of 18 (22 if full time student), or to any unmarried child incapable of self-support due to a disability which occurred before age 18. Benefit per child is the smallest of:</p> <ul style="list-style-type: none"> • 50% of the spouse's annuity • \$6,189.84 (\$7,428.96 if no spouse benefits apply) as of 12/01/2017, increased annually • \$18,569.52 (\$22,286.88 if no spouse benefits apply) divided by the number of children as of 12/01/2017, increased annually.
Changes Since Prior Valuation	None of which we are aware.