

City of Fairfax Retirement Plan for Public Safety Employees

37th Actuarial Valuation Report

June 30, 2019



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September 30, 2019

Administrative Committee
City of Fairfax Retirement Plan
for Public Safety Employees
Fairfax, Virginia

**Re: City of Fairfax Retirement Plan for Public Safety Employees Actuarial Valuation as of June 30, 2019
Actuarial Disclosures**

Ladies and Gentlemen:

The results of the June 30, 2019 Annual Actuarial Valuation of the City of Fairfax Retirement Plan for Public Safety Employees are presented in this report.

This report was prepared at the request of the City and is intended for use by the Retirement System and those designated or approved by the City. This report may be provided to parties other than the System only in its entirety and only with the permission of the City. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure the System's funding progress and to determine the employer contribution rate for the fiscal year ending June 30, 2021. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in the appendix of this report. This report includes risk metrics on pages 42 and 43 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through June 30, 2019. The valuation was based upon information furnished by the City concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the City.

This report was prepared using assumptions adopted by the City. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. Additional information about the actuarial assumptions is included in the appendix of this report.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the City of Fairfax Retirement Plan for Public Safety Employees as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Heidi G. Barry, Mark Buis and Stephanie Crawford are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

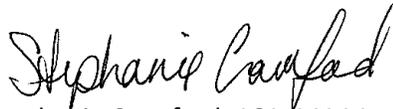
Respectfully submitted,



Heidi G. Barry, ASA, FCA, MAAA



Mark Buis, FSA, EA, FCA, MAAA



Stephanie Crawford, ASA, MAAA

HGB/MB/SC:ah



Comments and Recommendations

General Financial Objective: A sound general financial objective for any public employee retirement plan is to *establish and receive contributions which, expressed as percents of active member payroll, will remain approximately level from generation to generation of citizens.*

Fairfax Public Safety Plan Status: Over the past decade the objective of level-contribution-percent financing has been difficult to achieve. Investment returns in excess of the assumed rate in the mid to late 90s acted as a credit against the ongoing annual cost of the plan. This resulted in contribution rates declining to zero during this period, and remaining at zero for seven years. Contributions were once again required of the City beginning with the 2006/2007 fiscal year. The contribution rate was 18.60% based on the 2018 valuation and has risen to 21.24% of payroll based on the 2019 valuation.

As a by-product of achieving level contribution financing, actuarial accrued liabilities usually become more and more funded over a period of years. The funded ratio was adversely affected by the market downturn in late 2008 and early 2009 (as were virtually all other public employee retirement systems in the country). On a funding value of assets basis, the Plan has an 84.9% funded ratio. On a market value of assets basis, the Retirement Plan has an 82.7% funded ratio.

Results from This Year: Overall experience during the year ending June 30, 2019 was less favorable than projected. The primary cause for the loss was poor asset performance. The recognized rate of return was 3.3% compared to an assumed rate of 6.25%. Investment gains and losses that occur each year are smoothed in over a 5-year period. Although there were carryover gains from prior years that were recognized, the current and prior unfavorable losses more than offset those gains.

Reserve Strength: Member contributions and liabilities for present retired lives continue to be 100% covered by present Fund assets. The remainder of Fund assets covers 49% of member accrued liabilities, less than was covered in the prior year (see page 9). The funded status is normally expected to gradually trend towards 100% over time.

Employer Contribution Rate: The computed rate for the fiscal year ending June 30, 2021 is 21.24% of active member payroll in accordance with the current funding policy.

Funding Value of Retirement Plan Assets: The ratio of the funding value of Retirement Plan assets to the market value of Retirement Plan assets is currently 103%.

Comments and Recommendations

Assumptions and Methods: There were no changes in assumptions or methods in the 2019 valuation.

Benefit Provisions: There were no changes in benefit provisions in the 2019 valuation.

GASB Standards: In June 2012, the Governmental Accounting Standards Board (GASB) issued new pension accounting Statements No. 67 and No. 68 for retirement systems and sponsoring governmental entities respectively. The information for GASB Statements No. 67 and No. 68 has been issued in a separate report.

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the Plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the Plan earning 6.25% on the funding value of assets), it is expected that:

- (1) The employer normal cost as a percentage of pay will decrease to the level of the current new entrants (i.e., members hired after July 1, 2014) normal cost as time passes and the majority of the active population is comprised of members hired after this date; and
- (2) The funded status of the plan will increase gradually towards a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations, for example: transferring the liability to an unrelated third party in a market value type transaction.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the Plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. The current funded status is 84.9%. Even if the funded status measurement in this report was 100%, it would not be synonymous with no required future contributions. If the funded status were 100%, the Plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets.

ASSETS AND VALUATION RESULTS

Computed Employer Contribution Rates

Contributions Computed as of June 30	Contributions Expressed as %s of Active Member Payroll	
	2019	2018
Contributions for Fiscal Year End	2021	2020
Normal Cost:		
Age and service benefits	12.80 %	12.65 %
Deferred benefits	1.46 %	1.51 %
Disability benefits	0.90 %	0.92 %
Death-before-retirement benefits	0.36 %	0.37 %
Future refunds of member contributions	0.59 %	0.61 %
Total Normal Cost	16.11 %	16.06 %
Member Contributions	7.00 %	7.00 %
Employer Normal Cost	9.11 %	9.06 %
Unfunded Actuarial Accrued Liabilities		
Active Members	12.13 %	9.54 %
Total Computed Employer Contribution	21.24 %	18.60 %

Computed Employer Contribution Rates Comparative Statement

Valuation Date	Active Members in Valuation		Last Year's Change in		Employer Unfunded AAL		Computed Employer Rate
	Number	Average Pay \$	Average Pay %	Inflation (CPI)	Amount	Financing Period*	
June 30							
2010	133	\$79,005	(2.1)%	1.1 %	\$(758,720)	10 yrs.	7.18 %
2011	132	78,169	(1.1)%	3.6 %	(325,044)	10	7.85 %
2012 [^]	132	77,039	(1.4)%	1.7 %	6,345,734	10	15.49 %
2013	137	81,720	6.1 %	1.8 %	8,995,625	10	16.64 %
2014 [#]	142	81,418	(0.4)%	2.1 %	5,496,252	10	12.24 %
2015	135	84,998	4.4 %	0.1 %	3,217,046	10	10.27 %
2016	137	83,875	(1.3)%	1.0 %	3,849,216	10	11.08 %
2017	137	86,041	2.6 %	1.6 %	6,121,480	10	13.15 %
2018 [^]	132	87,654	1.9 %	2.9 %	9,798,710	10	18.60 %
2019	133	88,950	1.5 %	1.6 %	12,413,869	9-10	21.24 %

Plan amendment.

[^] After assumption changes adopted following experience study.

* 10-year layered amortization was implemented beginning with the June 30, 2018 valuation.

Determination of Experience Gain (Loss) Year Ended June 30, 2019

(1) UAAL at start of year	\$ 9,798,710
(2) Employer normal cost for the year	1,048,268
(3) Actual employer contributions	1,477,700
(4) Net interest accrual on (1), (2) and (3)	599,135
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	9,968,413
(6) Change from benefit increases	0
(7) Change from revised actuarial assumptions or methods	0
(8) Expected UAAL after changes: (5) + (6) + (7)	9,968,413
(9) Actual UAAL at end of year	12,413,869
(10) Gain (Loss): (8) - (9)	(2,445,456)
(11) Actuarial Accrued Liabilities at start of year	79,818,792
(12) Gain (Loss) as a percent of Actuarial Accrued Liabilities at start of year: (10)/(11)	(3.06)%

Layered Amortization Schedule

City of Fairfax Retirement Plan for Public Safety Employees

Type of UAAL*	Original Amortization Period (in years)	June 30, 2020 Outstanding UAAL Balance [@]	Amounts for Fiscal Year Ending June 30, 2021		
			Remaining Amortization Period (in years)	Annual Amortization Payment	% of Payroll Amortization Payment
Initial UAAL					
6/30/2018 and prior	10	\$5,263,804	9	\$674,099	
Changes From Updated Actuarial Assumptions					
6/30/2018	10	\$4,076,719	9	\$522,077	
(Gain) Loss From Experience					
6/30/2019	10	\$2,654,484	10	\$310,159	
Changes From Updated Benefits					
Totals		\$11,995,007		\$1,506,335	12.13%

* *Unfunded Actuarial Accrued Liability (UAAL).*

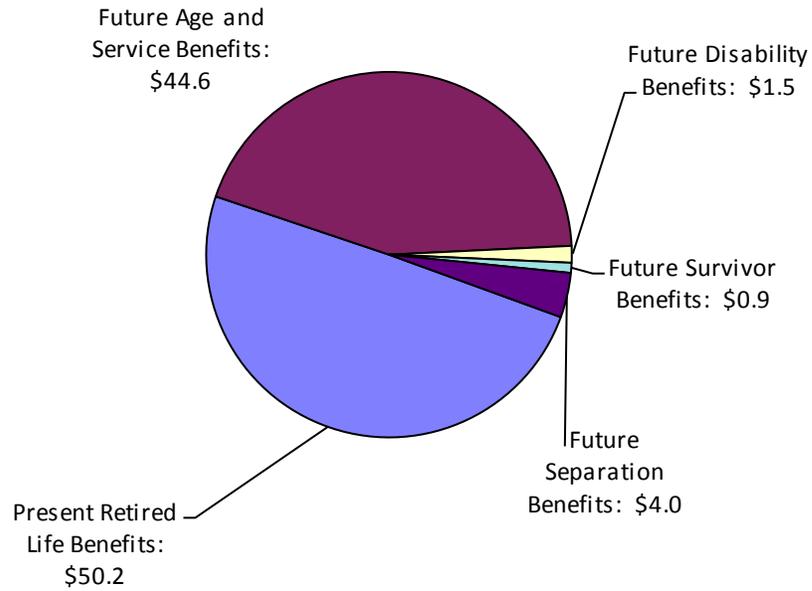
@ *This is the remaining balances as of the valuation date projected to the beginning of the fiscal year shown above.*

Actuarial Accrued Liabilities June 30, 2019

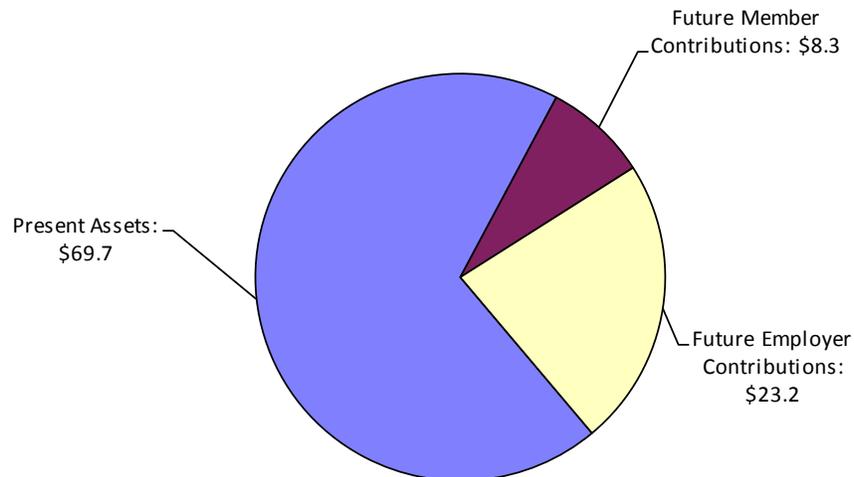
Present Value at Valuation Date of	(1) Total Present Value	(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1) - (2)
Benefits to be paid to present retired lives	\$50,152,320	\$ 0	\$50,152,320
Age and service benefits likely to be paid to present active members	44,646,833	15,072,255	29,574,578
Disability benefits likely to be paid to present active members who become permanently disabled	1,548,415	1,105,134	443,281
Survivor benefits likely to be paid to beneficiaries of present active members who die before retiring	902,883	426,946	475,937
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active and inactive members	3,985,594	2,497,225	1,488,369
Computed Actuarial Liabilities	\$101,236,045	\$19,101,560	\$82,134,485
Total Applicable Assets			\$69,720,616
Unfunded Actuarial Accrued Liability			\$12,413,869

Financing of Benefit Promises June 30, 2019

101.2 Million of Benefit Liabilities



101.2 Million of Present and Future Assets



Short Condition Test - Comparative Statement

The Fairfax funding objective is to meet long term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the Plan are level in concept and soundly executed, the Plan will **pay all promised benefits when due -- the ultimate test of financial soundness**. Testing for level contribution rates is **the** long-term solvency test.

A short condition test is one means of checking a plan's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with:

- 1) Active member contributions on deposit;
- 2) The liabilities for future benefits to present retired lives; and
- 3) The liabilities for service already rendered by active members.

In a plan that has been following the discipline of level percent of payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the Plan.

The following schedule will show the history of the short condition test of the Plan:

June 30	Actuarial Accrued Liabilities (\$ Thousands) for				Portion of Liabilities Covered by Assets		
	(1)	(2)	(3)	Valuation Assets	(1)	(2)	(3)
	Member Contributions on Deposit	Retirants and Beneficiaries	Active and Inactive Members				
2004@	\$ 5,838	\$ 22,521	\$ 15,137	\$ 51,252	100 %	100 %	151 %
2005	6,752	22,255	16,145	52,393	100 %	100 %	145 %
2006	7,506	22,182	19,454	53,939	100 %	100 %	125 %
2007^	8,228	23,377	22,284	57,910	100 %	100 %	118 %
2008	8,752	24,563	23,161	61,166	100 %	100 %	120 %
2009	8,797	27,218	22,438	60,637	100 %	100 %	110 %
2010	9,876	26,627	22,829	60,188	100 %	100 %	104 %
2011	10,370	27,362	22,360	60,418	100 %	100 %	102 %
2012^	9,195	33,631	22,057	58,538	100 %	100 %	71 %
2013	9,334	33,272	24,581	58,191	100 %	100 %	63 %
2014@	9,569	33,456	25,304	62,833	100 %	100 %	78 %
2015#	9,228	34,943	25,209	66,163	100 %	100 %	87 %
2016	9,226	37,641	23,798	66,816	100 %	100 %	84 %
2017	8,471	42,631	23,693	68,673	100 %	100 %	74 %
2018^	7,762	46,391	25,666	70,020	100 %	100 %	62 %
2019	7,718	50,152	24,264	69,721	100 %	100 %	49 %

^ After assumption changes adopted following experience study.

@ After benefit change.

New benefit tier added.

Statement of Plan Assets as of June 30, 2018 and 2019

	2019	2018
Cash	\$ 0	\$ 118
Money market fund	551,347	420,774
Government and agency	0	0
Real Estate	0	0
Corporate debt	0	0
Common stock	0	8
Foreign stock	0	0
Accrued income	778	458
Mortgages	0	0
Mutual funds	67,379,443	67,247,897
Subtotal	\$67,931,568	\$67,669,255
Other	0	186,578
 Net assets held in trust for pension benefits (A schedule of funding progress for the plan is presented on page 14.)	 \$67,931,568	 \$67,855,833

Assets by category were provided by the plan administrator in total for both the Public Safety Retirement Plan and the General Employees Retirement Plan. The numbers above were computed by taking the total amount provided and multiplying by the percent that the market value of the Public Safety Plan bears to the total market value of both plans.

Statement of Changes in Plan Assets for the Fiscal Years Ended June 30, 2018 and 2019

	Reconciliation as of June 30,	
	2019	2018
Additions		
Contributions		
Employer	\$ 1,477,700	\$ 1,261,540
Plan members	781,348	812,118
Other receipts	(8,534)	(5,678)
Total contributions	2,250,514	2,067,980
Investment return		
Net appreciation	866,135	2,261,259
Interest and dividends	858,187	718,751
Gain(loss) on sale of securities	1,368,800	1,540,949
Subtotal	3,093,122	4,520,959
Less investment expense	445,084	441,191
Net investment return	2,648,038	4,079,768
Total additions	4,898,552	6,147,748
Deductions		
Benefits	4,592,951	4,305,647
Refunds of contributions	229,866	142,087
Other	0	0
Total deductions	4,822,817	4,447,734
Net increase	75,735	1,700,014
Net assets held in trust for pension benefits		
Beginning of year	\$67,855,833	\$66,027,652
Beginning of year adjustment	0	128,167
End of year	\$67,931,568	\$67,855,833

Development of Funding Value of Retirement Plan Assets (Market Related Value)

Year Ended June 30:	2016	2017	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	\$66,163,010	\$66,815,712	\$68,673,375	\$70,020,082				
B. Market Value End of Year	61,411,038	66,027,652	67,855,833	67,931,568				
C. Market Value Beginning of Year	64,053,842	61,411,038	66,027,652	67,855,833				
D. Non-Investment Net Cash Flow	(1,709,215)	(2,038,200)	(2,251,587)	(2,572,303)				
E. Investment Return								
E1. Market Total: B-C-D	(933,589)	6,654,814	4,079,768	2,648,038				
E2. Assumed Rate of Return	6.75%	6.75%	6.75%	6.25%				
E3. Amount for Immediate Recognition	4,408,317	4,441,271	4,559,462	4,295,871				
E4. Amount for Phased-In Recognition: E1-E3	(5,341,906)	2,213,543	(479,694)	(1,647,833)				
F. Phased-In Recognition of Investment Return								
F1. Current Year: 0.20 x E4	(1,068,381)	442,708	(95,938)	(329,566)				
F2. First Prior Year	(971,854)	(1,068,381)	442,708	(95,938)	\$ (329,566)			
F3. Second Prior Year	732,294	(971,854)	(1,068,381)	442,708	(95,938)	\$ (329,566)		
F4. Third Prior Year	319,824	732,294	(971,854)	(1,068,381)	442,708	(95,938)	\$(329,566)	
F5. Fourth Prior Year	(1,058,283)	319,825	732,297	(971,857)	(1,068,382)	442,711	(95,942)	\$(329,569)
F6. Total Recognized Investment Gain	(2,046,400)	(545,408)	(961,168)	(2,023,034)	(1,051,178)	17,207	(425,508)	(329,569)
G. Funding Value End of Year:								
G1. Preliminary Funding Value End of Year: A+D+E3+F6	66,815,712	68,673,375	70,020,082	69,720,616				
G2. Upper Corridor Limit: 120% X B			81,427,000	81,517,882				
G3. Lower Corridor Limit: 80% X B			54,284,666	54,345,254				
G4. Adjustment to Funding Value			0	0				
G5. Funding Value End of Year			70,020,082	69,720,616				
H. Difference between Market & Funding Value	(5,404,674)	(2,645,723)	(2,164,249)	(1,789,048)	(737,870)	(755,077)	(329,569)	0
I. Market Rate of Return	(1.5)%	11.0 %	6.3 %	4.0 %				
J. Recognized Rate of Return	3.6 %	5.9 %	5.3 %	3.3 %				

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. The Funding Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to Market Value.

Changes in Assets (Cash & Investments) Year Ended June 30, 2019

Financial activity during fiscal year 2018-2019 was reported to the actuary as follows.

General	Police/Fire	TOTAL	Item
\$59,661,418	\$67,855,833	\$127,517,251	A1. Beginning Market
524,773	781,348	1,306,121	B1. Member Contributions
932,247	1,477,700	2,409,947	B2. Employer Contributions
(77,233)	(229,866)	(307,099)	B3. Refund of Member Contributions
(3,542,135)	(4,592,951)	(8,135,086)	B4. Retirement Benefits
(7,568)	(8,534)	(16,102)	B5. Other Receipts
(2,169,916)	(2,572,303)	(4,742,219)	B6. Net New Money: B1+B2+B3+B4+B5
761,034	858,187	1,619,221	C1. Ordinary Investment Return
(394,697)	(445,084)	(839,781)	C2. Investment Expense
1,213,839	1,368,800	2,582,639	C3. Realized Gains & Losses
768,082	866,135	1,634,217	C4. Unrealized Gains & Losses
2,348,258	2,648,038	4,996,296	C5. Net Investment Return (Market): C1+C2+C3+C4
59,839,760	67,931,568	127,771,328	D1. Ending Market A1+B6+C5

Schedule of Funding Progress (Dollar Amounts in Millions)

Actuarial Valuation Date	Applicable Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Employer Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	Employer UAAL as a Percent of Covered Payroll [(b)-(a)]/(c)
6/30/2010	\$60.19	\$59.43	\$ (0.76)	101.3 %	\$ 10.51	-
6/30/2011	60.42	60.09	(0.33)	100.5 %	10.32	-
6/30/2012	58.54	64.88	6.34	90.2 %	10.17	62.3 %
6/30/2013	58.19	67.19	9.00	86.6 %	11.20	80.4 %
6/30/2014	62.83	68.33	5.50	92.0 %	11.56	47.6 %
6/30/2015	66.16	69.38	3.22	95.4 %	11.47	28.1 %
6/30/2016	66.82	70.66	3.84	94.6 %	11.49	33.4 %
6/30/2017	68.67	74.79	6.12	91.8 %	11.79	51.9 %
6/30/2018	70.02	79.82	9.80	87.7 %	11.57	84.7 %
6/30/2019	69.72	82.13	12.41	84.9 %	11.83	104.9 %

Schedule of Employer Contributions and Normal Costs

Schedule of Employer Contributions

Fiscal Year Ended June 30	Actuarially Determined Employer Contribution		Percent Contributed
	As Percent of Payroll	As Dollar Amount	
2010	3.38%	\$ 365,744	100%
2011	6.14%	421,734	100%
2012	7.18%	722,639	100%
2013	7.85%	818,112	100%
2014	15.49%	1,772,644	100%
2015	16.64%	1,854,639	100%
2016	12.24%	1,359,471	100%
2017	10.27%	1,173,293	100%
2018	11.08%	1,261,540	100%
2019	13.15%	1,477,700	100%
2020	18.60%		
2021	21.24%		

Schedule of Employer Normal Costs

Valuation Year Ended June 30	Employer Normal Cost
2010	7.84%
2011	8.11%
2012	7.99%
2013	7.90%
2014	7.61%
2015	7.47%
2016	7.40%
2017	7.36%
2018	9.06%
2019	9.11%

BENEFIT PROVISIONS AND VALUATION DATA

Public Safety Employees

Benefit Provisions Evaluated/Considered

June 30, 2019

**Employees Hired
Before 4/1/83**

**Employees Hired Between
4/1/83 and 6/30/14**

**Employees Hired
7/1/14 and Later**

Normal Age and Service Retirement

The benefits are described in the terms of amounts payable to and after Social Security Full Retirement Age (SSFRA).

Eligibility

Age 50 with 5 years of service, or 20 years of service regardless of age.

Amount

To SSFRA:

Straight life benefit of 0.5% of 3-year highest average earnings times the first 20 years of service plus 2.0% of 3-year highest average earnings times all credited service up to the maximum years of service.

At SSFRA:

Straight life benefit of 0.5% of 3-year highest average earnings times the first 20 years of service plus 0.5% of 3-year highest average pay times all credited service up to the maximum years of service.

Total service includes credit for sick leave unused at retirement.

For retirements before January 1, 2004, the maximum number of years is 30. For retirements after January 1, 2004, the maximum is 30 plus years of creditable service attributable to eligible unused sick leave.

Eligibility

Age 55 with 5 years of service, or 25 years of service regardless of age.

Amount

To Age 55:

Straight life benefit of 2.5% of 3-year highest average earnings times total service.

From age 55 to SSFRA:

Straight life benefit of 1.5% of 3-year highest average earnings times total service.

At SSFRA:

Straight life benefit of 1.3% of 3-year highest average earnings times total credited service.

Total service includes credit for sick leave unused at retirement.

Eligibility

Age 57 with 7 years of service, or 25 years of service regardless of age.

Amount

To Age 55:

Straight life benefit of 2.5% of 5-year highest average earnings times total service.

From age 55 to SSFRA:

Straight life benefit of 1.5% of 5-year highest average earnings times total service.

At SSFRA:

Straight life benefit of 1.3% of 5-year highest average earnings times total credited service.

Total service includes credit for sick leave unused at retirement.

Deferred (Vested) Retirement

Eligibility

5 years of service.

Amount

Accrued normal retirement benefit payable at age 50.

Eligibility

5 years of service.

Amount

Accrued normal retirement benefit payable at normal retirement age.

Eligibility

7 years of service.

Amount

Accrued normal retirement benefit payable at normal retirement age.

Public Safety Employees

Benefit Provisions Evaluated/Considered

June 30, 2019

Employees Hired Before 4/1/83

Employees Hired Between 4/1/83 and 6/30/14

Employees Hired 7/1/14 and Later

Disability Retirement

Eligibility

5 years of service.

Amount

Computed in the same manner as normal retirement except that 'total service' is the smallest of:

- (i) twice the years of credited service.
- (ii) the years of credited service the participant would have had at age 60.
- (iii) 30 years.

Benefit payable prior to Social Security age, when combined with worker's compensation, Social Security, VRS benefits, and any earned income may not exceed 75% of 3-year highest average earnings.

Eligibility

5 years of service.

Amount

The spouse or parent receives the same monthly benefit that would have been payable if the member had retired at death, elected the joint and 100% survivor option and died immediately thereafter.

Minimum benefit is 15% of 3-year highest average earnings. Benefits for dependent children and parents may also be payable. Special rules apply if the spouse was less than 40 years old when the member died.

Eligibility

5 years of service.

Amount

Computed in the same manner as normal retirement except that 'total service' is:

- (i) actual accrued service if the disability is from non-duty related causes.
- (ii) the number of years of service the participant would have had at the normal retirement date if the disability is from duty related causes.

Benefit payable prior to Social Security age, when combined with worker's compensation, Social Security, VRS benefits, and any earned income, may not exceed 75% of 3-year highest average earnings.

Benefits for Death before Retirement

Eligibility

5 years of service.

Amount

The spouse or parent receives the same monthly benefit that would have been payable if the member had retired at death, elected the joint and 100% survivor option and died immediately thereafter.

Minimum benefit is 15% of 3-year highest average earnings. Benefits for dependent children and parents may also be payable. Special rules apply if the spouse was less than 40 years old when the member died.

Eligibility

7 years of service.

Amount

Computed in the same manner as normal retirement except that 'total service' is:

- (i) actual accrued service if the disability is from non-duty related causes.
- (ii) the number of years of service the participant would have had at normal retirement date if the disability is from duty related causes.

Benefit payable prior to Social Security age, when combined with worker's compensation, Social Security, VRS benefits, and any earned income, may not exceed 75% of 5-year highest average earnings.

Eligibility

7 years of service.

Amount

The spouse or parent receives the same monthly benefit that would have been payable if the member had retired at death, elected the joint and 100% survivor option and died immediately thereafter.

Minimum benefit is 15% of 5-year highest average earnings. Benefits for dependent children and parents may also be payable. Special rules apply if the spouse was less than 40 years old when the member died.

Public Safety Employees Benefit Provisions Evaluated/Considered June 30, 2019

Employees Hired Before 4/1/83

Employees Hired Between 4/1/83 and 6/30/14

Employees Hired 7/1/14 and Later

Benefit Increases after Retirement

Monthly benefits are adjusted annually, to reflect changes in the Inflation Index (CPI) since retirement, with maximum increase of 5% in any year.

Monthly benefits are adjusted annually, to reflect changes in the Inflation Index (CPI) since retirement, with maximum increase of 5% in any year.

Monthly benefits are adjusted annually, to reflect changes in the Inflation Index (CPI) since retirement, with maximum increase of 3% in any year.

Member Contributions

5.5% of member's pay. No contributions after 30 years of credited service. Interest credited, based on actual investment return but not less than 4% annually until June 30, 2014. Starting July 1, 2014, interest credited at a rate of 3.0% annually.

7.0% of member's pay. Interest credited, based on actual investment return but not less than 4% annually until June 30, 2014. Starting July 1, 2014, interest credited at a rate of 3.0% annually.

7.0% of member's pay. Interest credited at the rate of 3.0% annually.

Optional Forms of Benefit Payment

Option 1: Reduced benefits are paid to the member for life. Upon death of the member a designated portion of the member's benefit is payable to the contingent annuitant for life. Upon death of the contingent annuitant, the member's benefit will revert to the unreduced straight life amount if the retiree is alive at that time.

Same.

Same.

Option 2: Members retiring prior to eligibility for VRS or OASDI benefits may elect to receive a higher amount prior to commencement of those benefits and a lower amount later.

Same.

Same.

Option factors are based upon the 1984 actuarial equivalent tables of the Virginia Retirement System.

Same.

Same.

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Retired Lives Hired Before 4/1/83 by Type of Benefit as of July 1, 2019*

Type of Benefit	Number	Monthly Amounts		
		Original		Current
		To Soc. Sec. Age #	After Soc. Sec. Age #	
Age and Service				
Single Life Benefit	52	\$174,459	\$47,115	\$149,409
Joint and Survivor	8	13,881	13,881	19,422
Survivor Beneficiaries	1	571	571	1,006
Total Age and Service	61	188,911	61,567	169,837
Disability				
Single Life Benefit	4	4,172	2,295	6,256
Joint and Survivor	3	2,173	2,173	5,369
Survivor Beneficiaries	0	0	0	0
Total Disability	7	6,345	4,468	11,625
Death-in-Service	0	0	0	0
Grand Total	68	\$195,256	\$66,035	\$181,462

Benefits for beneficiaries of deceased members change when the member would have attained the age indicated.

Special rules apply to dependent children.

* Includes July 1, 2019 COLA, if applicable.

Retired Lives Hired Between 4/1/83 and 7/1/14 by Type of Benefit as of July 1, 2019**

Type of Benefit	Number	Monthly Amounts			
		Original			Current
		To Age 55 **	At Age 55 #	After Soc. Sec. Age #	
Age and Service					
Single Life Benefit	42	\$176,558	\$167,503	\$92,749	\$203,588
Joint and Survivor	5	4,348	11,388	9,871	11,784
Survivor Beneficiaries	1	0	2,064	1,789	2,007
Total Age and Service	48	180,906	180,955	104,409	217,379
Disability					
Single Life Benefit	0	0	0	0	0
Joint and Survivor	1	2,314	1,388	1,204	2,314
Survivor Beneficiaries	0	0	0	0	0
Total Disability	1	2,314	1,388	1,204	2,314
Death-in-Service	2	3,257	2,317	1,379	2,832
Grand Total	51	\$186,477	\$184,660	\$106,992	\$222,525

Benefits for beneficiaries of deceased members change when the member would have attained the age indicated. Special rules apply to dependent children.

* The "To Age 55" amounts are zero for retirees who retired after age 55.

** Includes July 1, 2019 COLA, if applicable.

Retirants and Beneficiaries Hired Before 4/1/83 by Age as of July 1, 2019*

Age	No.	Monthly Amounts		
		Original		Current
		To Soc. Sec. Age #	After Soc. Sec. Age #	
58	3	\$ 12,712	\$ 3,294	\$ 15,946
59	2	12,705	3,256	14,256
60	2	12,622	3,207	14,432
61	1	2,028	810	2,906
62	5	17,744	4,958	24,369
63	8	30,192	11,286	38,893
64	2	9,072	5,513	11,123
65	2	2,072	2,072	3,349
66	3	8,297	3,235	5,040
67	2	9,176	2,387	3,301
68	3	8,257	1,628	2,556
69	1	774	774	1,107
70	3	11,355	3,169	4,563
71	3	4,901	2,337	4,204
72	3	8,118	2,850	4,054
73	4	12,699	4,105	6,237
74	4	6,927	2,801	6,278
75	1	1,703	52	124
76	2	3,722	1,627	4,039
77	5	9,142	3,012	6,330
78	3	3,887	1,667	3,868
81	1	1,576	129	283
82	1	1,927	213	542
83	1	1,360	202	668
84	2	1,368	1,368	2,651
85	1	920	83	343
Totals	68	\$195,256	\$66,035	\$181,462

Benefits for beneficiaries of deceased members change when the member would have attained the age indicated. Special rules apply to dependent children.

* Includes July 1, 2019 COLA, if applicable.

**Retirants and Beneficiaries
Hired Between 4/1/83 and 7/1/14 by Age
as of July 1, 2019****

Age	No.	Monthly Amounts			
		Original			Current
		To Age 55 **	At Age 55 #	After Soc. Sec. Age #	
19	1	\$ 605	\$ 726	\$ 0	\$ 887
45	1	2,314	1,388	1,204	2,314
52	6	43,150	30,397	17,361	44,404
53	2	11,585	9,130	3,689	12,207
54	7	45,437	33,197	17,067	46,791
55	4	16,640	14,062	7,057	14,761
56	1	0	4,393	104	4,530
57	3	16,578	11,570	6,774	13,246
58	5	19,874	15,946	8,872	17,090
59	5	6,601	17,567	10,028	18,404
60	2	0	8,465	7,336	9,079
61	1	4,960	2,976	2,579	3,349
62	5	9,888	15,871	10,140	17,202
63	3	8,845	8,532	7,395	9,556
65	1	0	2,773	2,404	2,963
66	2	0	4,546	3,941	4,295
72	2	0	3,121	1,041	1,447
Totals	51	\$186,477	\$184,660	\$106,992	\$222,525

Benefits for beneficiaries of deceased members change when the member would have attained the age indicated. Special rules apply to dependent children.

* The "To Age 55" amounts are zero for retirees who retired after age 55.

** Includes July 1, 2019 COLA, if applicable.

**Vested Former Members Hired Before 7/1/14
Eligible for a Deferred Benefit
by Age as of July 1, 2019**

Age	No.	Monthly Amounts	
		Original	
		To Soc. Sec. Age	After Soc. Sec. Age
34	1	\$ 567	\$ 491
45	1	1,585	1,374
48	1	2,360	2,046
50	1	1,857	1,609
54	1	1,033	344
55	2	1,893	1,057
62	1	1,098	951
Totals	8	\$ 10,393	\$ 7,872

A vested former member is a member who terminated the City's employment with 5 or more years of service and did not withdraw his or her accumulated contributions. Such members are eligible for benefits at the normal retirement age.

Present Active Members by Age and Years of Service as of June 30, 2019

Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	7							7	\$ 402,432
25-29	21	1						22	1,404,978
30-34	12	15	5					32	2,368,312
35-39	2	7	9	1				19	1,649,585
40-44	1	3	8	6	1			19	1,884,607
45-49	1	1		6	6	2		16	1,964,022
50-54	1	1	1	1	3	4	1	12	1,421,058
55-59	1	1		1	1	1		5	580,057
65					1			1	155,294
Totals	46	29	23	15	12	7	1	133	\$ 11,830,345

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Group Averages:

Age: 37.6 years
Service: 10.0 years
Annual Pay: \$88,950

Active Members in Actuarial Valuations Comparative Statement

June 30	Hired Before 4/1/83				Hired After 4/1/83 & Before 7/1/14				Hired After 7/1/14				Police/Fire Plan Totals				
	Group Averages				Group Averages				Group Averages				Group Averages				
	No.	Age	Service	Pay	No.	Age	Service	Pay	No.	Age	Service	Pay	No.	Age	Service	Pay	% Inc.
2000	29	46.0	21.1	\$68,420	79	36.2	9.4	\$53,294					108	38.8	12.6	\$57,356	6.7 %
2001	27	47.1	22.1	72,135	88	36.3	9.0	54,079					115	38.8	12.1	58,319	1.7 %
2002	21	47.2	23.0	74,476	89	36.5	9.3	56,499					110	38.5	11.9	59,931	2.8 %
2003	18	47.9	23.8	78,824	98	37.0	9.2	59,077					116	38.7	11.4	62,141	3.7 %
2004	13	47.3	24.4	84,194	106	37.3	9.3	62,060					119	38.4	11.0	64,478	3.8 %
2005	13	48.3	25.5	86,594	106	38.2	10.2	65,766					119	39.3	11.9	68,041	5.5 %
2006	12	49.2	26.3	99,471	106	39.1	11.2	75,040					118	40.1	12.7	77,525	13.9 %
2007*	11	50.0	27.1	101,231	112	39.0	11.2	76,342					123	39.9	12.7	78,568	1.3 %
2008	9	50.4	27.6	101,674	126	38.2	10.8	76,646					135	39.0	11.9	78,315	(0.3)%
2009	7	50.8	28.2	102,538	121	38.7	11.3	79,424					128	39.4	12.2	80,688	3.0 %
2010	7	51.8	29.2	102,538	126	38.5	11.5	77,697					133	39.2	12.4	79,005	(2.1)%
2011	5	53.3	29.9	99,402	127	38.9	12.0	77,332					132	39.4	12.7	78,169	(1.1)%
2012	2	56.2	30.7	94,876	130	38.7	11.7	76,764					132	38.9	12.0	77,039	(1.4)%
2013	1	57.0	32.3	110,403	136	39.0	11.7	81,509					137	39.1	11.9	81,720	6.1 %
2014	1	58.0	33.3	110,403	141	39.5	11.9	81,212					142	39.6	12.0	81,418	(0.4)%
2015^	1	59.0	34.3	112,064	125	40.2	12.9	87,042	9	25.2	0.5	\$53,597	135	39.3	12.2	84,998	4.4 %
2016	1	60.0	35.3	112,064	117	40.6	13.3	87,242	19	27.9	0.9	61,658	137	39.0	11.8	83,875	(1.3)%
2017	1	61.0	36.3	117,552	106	40.8	13.5	92,533	30	28.7	1.3	62,051	137	38.3	11.0	86,041	2.6 %
2018					94	41.1	13.9	97,533	38	28.7	1.5	63,216	132	37.6	10.3	87,654	1.9 %
2019					87	41.5	14.2	99,938	46	30.1	2.1	68,169	133	37.6	10.0	88,950	1.5 %

* Method of reporting pay was changed for 2003.

^ After addition of new tier.

FINANCIAL PRINCIPLES

Financial Principles and Operational Techniques

Promises Made, and Eventually Paid: As each year is completed, the plan in effect hands an “IOU” to each member then acquiring a year of service credit --- the “IOU” says: “The City of Fairfax Public Safety Retirement Plan owes you one year’s worth of retirement benefits, payments in cash commencing when you qualify for retirement.”

The related *key financial questions* are:

Which generation of taxpayers contributes the money to cover the IOU?

The present taxpayers, who receive the benefit of the member’s present year of service?

Or the future taxpayers, who happen to be in Fairfax at the time the IOU becomes a cash demand?

The law governing plan financing intends that this year’s taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, ***the employer contribution rate will remain approximately level from generation to generation*** --- our children and our grandchildren will contribute the same percents of active payroll we contribute now.

(There are systems which have a design for deferring contributions to future taxpayers, lured by a lower contribution rate now and putting aside the consequence that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher taxes after you retire.)

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. ***Investment return*** becomes in effect the third contributor for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

Normal Cost (the cost of members’ service being rendered this year)

. . . plus . . .

Interest on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between (i) actuarial accrued liabilities and (ii) the accrued assets of the plan).

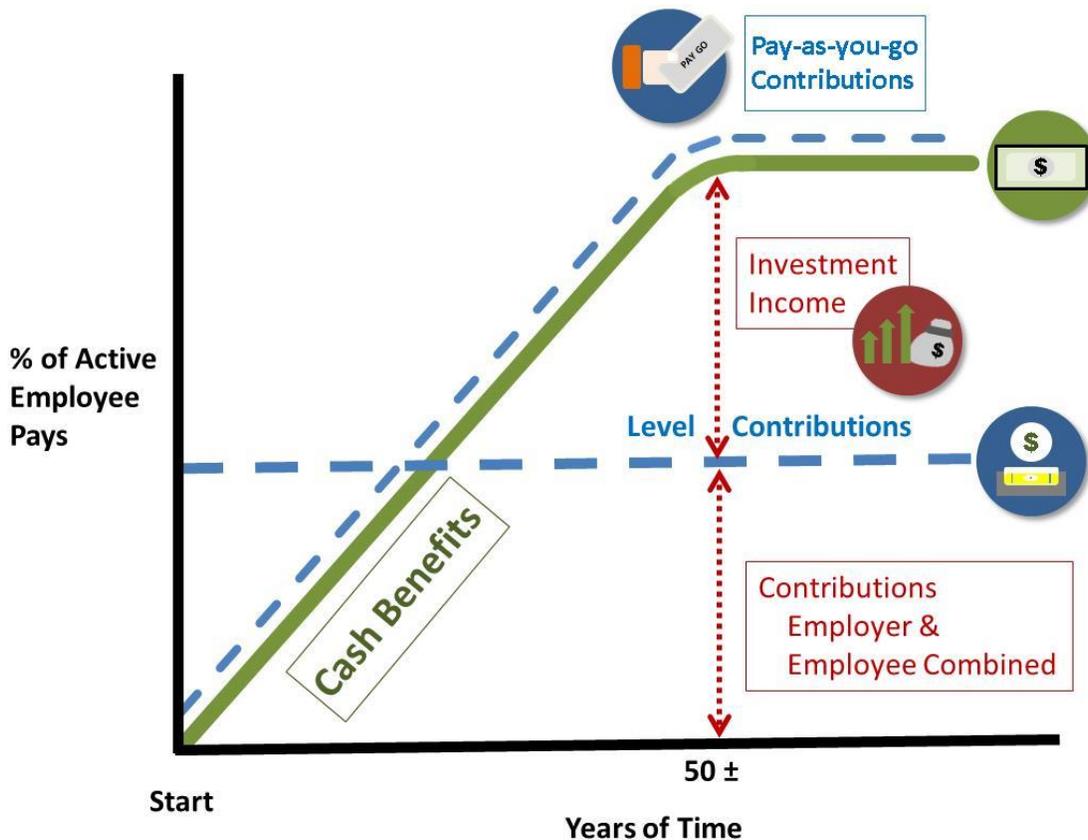
Computing Contributions to Support Plan Benefits: From a given schedule of benefits and from the employee data and asset data furnished, the actuary determines the contribution rates to support the benefits, by means of *an actuarial valuation and a funding method*.

An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement.

In making an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions.

Reconciling Differences Between Assumed Experience and Actual Experience: Except by coincidence, actual experience will not coincide exactly with assumed experience, regardless of the choice of the assumptions, the skill of the actuary, and the precision of the calculations. Some future events can be predicted with considerable precision. Others, such as economic activities tend to be volatile and *seem to defy reliable prediction*.

The plan copes with these continually changing differences by having periodic actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is *continuing adjustments in financial position*.



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
 - Rates of investment return
 - Rates of pay increase
 - Changes in active member group size
- **Non-Economic Risk Areas**
 - Ages at actual retirement
 - Rates of mortality
 - Rates of withdrawal of active members (turnover)
 - Rates of disability

The Actuarial Valuation Process

The financing diagram on the previous page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is an **increasing contribution method**; and the **level contribution method** which equalizes contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

- Covered Person Data**, furnished by plan administrator
 - Retired lives now receiving benefits
 - Former employees with vested benefits not yet payable
 - Active employees
- + **Asset Data** (cash and investments), furnished by plan administrator
- + **Assumptions concerning future financial experiences in various risk areas**, which assumptions are established by the Administrative Committee after consulting with the actuary
- + **The funding method** for employer contributions (the long-term, planned pattern for employer contributions)
- + **Mathematically combining the assumptions, the funding method, and the data**
- = Determination of:
 - Plan Financial Position**
 - and/or **New Employer Contribution Rate**

APPENDIX

Actuarial Cost Methods

Age and Service and Casualty Benefits. Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an individual **entry-age actuarial cost method** having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
- (ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

Differences in the past between assumed experience and actual experience (“actuarial gains and losses”) become part of actuarial accrued liabilities.

Financing of Unfunded Actuarial Accrued Liability (UAAL). Unfunded Actuarial Accrued Liabilities (the portion of total liabilities not covered by present assets or expected future normal cost contributions) were amortized as level (principal and interest combined) percent-of-payroll. The amortization period shall be decreased by one year annually beginning with a 10-year closed amortization period. A new 10-year amortization schedule will be created for unfunded liabilities arising during subsequent valuations (multiple layer amortizations) and preexisting unfunded liabilities will continue to be amortized based on their scheduled end date. The UAAL payment reflects payments expected to be made between the valuation date and the fiscal year for which the contributions in this report are scheduled to begin, which tends to smooth out changes in the contribution rates from year to year.

Funding Value of Assets. The valuation assets used for funding purposes is derived as follows: prior year valuation assets are increased by contribution and expected investment income and reduced by refunds, benefit payments and expenses. To this amount is added 20% of the difference between expected and actual investment income for each of the previous five years. Funding value of assets is limited to a 20% corridor around the Market Value. The application of the corridor was first implemented for purposes of the June 30, 2018 valuation.

Minimum Employer Contribution. The minimum employer contribution rate is equal to the normal cost, beginning with the June 30, 2018 valuation.

Summary of Assumptions used for the Fairfax Actuarial Valuations

Assumptions Adopted by the Administrative Committee after Consulting with Actuary

The actuarial assumptions used in performing the valuation are shown in this section of the report. The assumptions were adopted by the Administrative Committee and established for the June 30, 2018 actuarial valuation, based upon a study of experience during the period July 1, 2011 to June 30, 2017.

Economic Assumptions

The investment return rate used in making the valuation was 6.25% per year, compounded annually (net after administrative expenses). This rate of return is not the assumed real rate of return. The real rate of return over wages is the portion of investment return which is more than the wage inflation rate. Considering wage inflation recognition of 3.25%, the 6.25% investment return rate translates to **an assumed real rate of return of 3.00% over wages. The assumed real return over prices would be higher.**

Pay increase assumptions for individual active members are shown below. Part of the assumption for each age is for a merit and/or seniority increase, and the other 3.25% recognizes wage inflation. The assumptions were first used for the June 30, 2018 valuation.

Sample Ages	Pay Increase Assumptions for an Individual Employee		
	Merit & Seniority	Base (Economy)	Increase Next Year
20	4.50%	3.25%	7.75%
25	3.50	3.25	6.75
30	2.50	3.25	5.75
35	2.00	3.25	5.25
40	1.50	3.25	4.75
45	1.00	3.25	4.25
50	0.50	3.25	3.75
55	0.50	3.25	3.75
60	0.50	3.25	3.75
65	0.50	3.25	3.75
Ref	504		

Total active member payroll is assumed to increase 3.25% a year, which is the portion of the individual pay increase assumptions recognizing wage inflation.

Price inflation is assumed to be 2.50% per year. For all members hired prior to 7/1/2014, the 5% COLA cap was valued by assuming that the actual COLA paid would average 2.50% annually. For all members hired after 7/1/2014, the 3% COLA cap was valued by assuming that the actual COLA paid would average 2.25% annually.

The number of active members is assumed to continue at the present number.

Non-Economic Assumptions

The mortality table. The *mortality rates* utilized are based upon the RP-2014 tables, as extended, and include a margin for future mortality improvements projected using a fully generational improvement scale. The tables used were as follows:

- **Pre-Retirement:** The RP-2014 Employee Generational Mortality Tables, with adjustments and extended via cubic spline. These tables are adjusted backwards to 2006 with the MP-2014 scale, resulting in a base year of 2006 with future mortality improvements assumed each year using scale MP-2017.
- **Healthy Post-Retirement:** The RP-2014 Healthy Annuitant Generational Mortality Tables, with adjustments and extended via cubic spline. These tables are adjusted backwards to 2006 with the MP-2014 scale, resulting in a base year of 2006 with future mortality improvements assumed each year using scale MP-2017.
- **Disability Retirement:** The RP-2014 Disabled Mortality Tables, with adjustments and extended via cubic spline. These tables are adjusted backwards to 2006 with the MP-2014 scale, resulting in a base year of 2006 with future mortality improvements assumed each year using scale MP-2017.

These tables were first used for the June 30, 2018 valuation. Related values for sample ages are as follows:

Sample Age Now	Pre-Retirement Future Life Expectancy (Years)^		Healthy Post-Retirement Future Life Expectancy (Years)^		Disabled Retirement Future Life Expectancy (Years)^	
	Men	Women	Men	Women	Men	Women
	55	31.2	35.4	29.6	32.0	21.2
60	26.2	30.4	25.1	27.3	18.2	21.4
65	21.6	25.5	20.8	22.8	15.4	18.0
70	17.3	20.7	16.7	18.4	12.6	14.7
75	13.4	16.2	13.0	14.4	10.0	11.5
80	9.8	11.9	9.6	10.8	7.6	8.8
85	6.8	8.1	6.8	7.7	5.6	6.5
Ref	#2133x1sb0	#2134x1sb0	#2135x1sb0	#2136x1sb0	#2137x1sb0	#2138x1sb0

[^] Applicable to calendar year 2019. Rates in future years are determined by the MP-2017 projection scale.

The probabilities of retirement for members eligible to retire are shown below:

**Percent of Eligible Members
Retiring within Next Year**

Attained Age	Member Hired		
	Before April 1, 1983	After April 1, 1983 and Before July 1, 2014*	After July 1, 2014*
40	30%		
41	30		
42	30		
43	20		
44	20		
45	17	16%	16%
46	15	16	16
47	10	16	16
48	10	16	16
49	10	16	16
50	10	12	12
51	10	12	12
52	30	12	12
53	30	12	12
54	30	12	12
55	30	12	12
56	30	12	12
57	30	8	12
58	30	12	12
59	30	25	25
60	100	100	100
Ref	1460	2220	2796

* An additional 10% is added for the first year eligible for the 25 and out provision.

The probabilities of *withdrawal* from service and *disability* are shown for sample ages below:

Sample Ages	% of Active Members Separating within Next Year			
	Disability*		Other	
	Men	Women	Men	Women
25	0.0850%	0.0340%	18.50%	20.35%
30	0.1400	0.0540	9.30	10.28
35	0.2050	0.0890	4.10	4.56
40	0.2700	0.1220	1.90	2.14
45	0.3900	0.2920	1.50	1.70
50	0.5100	0.4590	0.90	1.04
55	0.2550	0.2290	0.50	0.60
60	0.0000	0.0000	0.50	0.60
Ref	458	459	ab1441x1	ab1444x1

* 50% of disabilities are assumed to be duty related.

A market related value of assets was used for valuation purposes (see page 12).

The data about persons now covered and about present assets was furnished by the Plan's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA).

Miscellaneous and Technical Assumptions

June 30, 2019

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	Reported pays were pay rates at July 1 including the COLA for the year. Other increases are assumed to occur uniformly throughout the year. This situation is approximated by assuming that pay increases occur six months after the beginning of the fiscal year.
Decrement Timing:	Decrements are assumed to occur mid-year (i.e., January 1).
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and turnover do not operate during retirement eligibility.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year.
Loads:	The normal cost and actuarial accrued liability, for age and service benefits were increased by 2.0% to account for inclusion of unused sick leave in the service used to calculate retirement benefits. Optional benefit factors are described in Sections 66-126 and 66-366 of the City of Fairfax Code of Ordinances. The factors used are not actuarially equivalent. Liabilities were increased 1.0% to reflect this.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Benefit Service:	Exact Fractional service is used to determine the amount of benefit payable.
Normal Form of Benefit:	The assumed normal form of benefit is the straight life form.

Definitions of Technical Terms

Accrued Service: Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability: The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as “past service liability.”

Actuary: A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation ASA and ultimately to Fellowship with the designation FSA.

Actuarial Assumptions: Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment return and pay increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (pay increases and investment return) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method: A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future benefits” between future normal costs and actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

Actuarial Equivalent: One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

Actuarial Gain (Loss): The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

Actuarial Present Value: The single sum now which is equal to a payment or series of payments in the past or future. It is determined by adjusting payments by rates of interest and by probabilities of payment.

Amortization: Paying off a debt with periodic payments.

Normal Cost: The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as “current cost.”

Unfunded Actuarial Accrued Liabilities: The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as “unfunded past service liability” or, strangely, “unfunded supplemental present value” or simply as “unfunded liability.”

City of Fairfax Retirement Plans For General and Public Safety Employees Actuarial Funding Policy

I. GENERAL

A. Purpose

- (1) The purpose of this Actuarial Funding Policy is to record the funding objectives and policy set by the Administrative Committee for the City of Fairfax Retirement Plans. The Administrative Committee establishes this Funding Policy to help ensure the systematic funding of future benefit payments for members of the Retirement Plans.
- (2) In 2012, the Governmental Accounting Standards Board (GASB) approved two new financial reporting standards. GASB Statement No. 67, "Financial Reporting for Pension Plans" replaces the requirements of GASB Statement No. 25. GASB Statement No. 68, "Accounting and Financial Reporting for Pensions" replaces the requirements of GASB Statements No. 27 and No. 50. Prior to the changes, the Annual Required Contribution (ARC) rate was used as a basis for funding decisions. The new GASB statements separate accounting cost (expense) from funding cost (contributions), necessitating the creation of this funding policy.
- (3) This funding policy shall be reviewed by the Administrative Committee annually for several years following creation. Subsequently, it shall be reviewed every five years in conjunction with the experience study.

B. Policy Objectives

- (1) Maintain adequate levels of assets sufficient to fund all benefits expected to be paid to members and beneficiaries when due.
- (2) Maintain stability of employer contributions rates, consistent with other funding objectives.
- (3) Support the public policy goals of accountability and transparency.
- (4) Monitor material risks to assist in any risk management strategies the Administrative Committee deems appropriate.
- (5) Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring costs to future members and employers.
- (6) Provide a reasonable margin for adverse experience to offset risk.
- (7) Review the Plans' investment return assumption, potentially in conjunction with a periodic asset liability study and in consideration of the Administrative Committee's risk profile.
- (8) Continue the systematic reduction of the Plans' Unfunded Actuarial Accrued Liabilities (UAAL).

II. LEGAL

A. Annual Actuarial Valuation

- (1) Section 66-193(b) and Section 66-433(b) of the Fairfax, Virginia Code of Ordinances require the Retirement Plans to have an actuarial valuation performed annually.

B. Annual Employer Contribution

- (1) The Administrative Committee is required, pursuant to Section 66-193 and Section 66-433 of the Fairfax, Virginia Code of Ordinances, to annually certify the annual required contribution to be made by the employer as follows:
 - (a) The cost of benefits under the plan, in excess of that portion of the cost provided through contributions by the participants, shall be borne by the city.
 - (b) The city shall retain an actuary, who by annual actuarial valuations shall determine the amount of the annual contributions by the city that are necessary to meet its obligations under the plan. The city shall transmit its contributions to the trustee each year, in such amounts and at such times as it may deem appropriate, in the aggregate amount actuarially determined as necessary to provide the benefits of the plan.
 - (c) All contributions by the city shall be irrevocable, and may be used only for the benefits of participants and their beneficiaries and contingent annuitants, except as otherwise provided in Section 66-232 or Section 66-472.

III. POLICY

A. Actuarial Cost Method

- (1) The individual entry age normal actuarial cost method of valuation shall be utilized in determining actuarial accrued liability and normal cost with the following characteristics:
 - (a) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
 - (b) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.
- (2) Differences in the past between assumed experience and actual experience (actuarial gains and losses) shall be factored into the actuarial accrued liability.
- (3) The normal cost shall be determined on an individual basis for each active member.

B. Asset Smoothing Method

- (1) The investment gains or losses of each valuation period, resulting from the difference between actual investment return and assumed investment return, shall be recognized annually in level amounts over a period determined by the Administrative Committee in consultation with its actuary, not to exceed five (5) years in calculating the funding value of assets.
- (2) Regardless of the results obtained from the smoothing method described in (1), the Funding Value of Assets shall not diverge from the Market Value of Assets by more than 20% (corridor). Based upon consultation with the Actuary, the Administrative Committee may combine bases (scheduled recognition of prior gains and losses) in order to reset the Funding Value of Assets to be equal to the Market Value of Assets when the difference between Market Value of Assets and Funding Value of Assets is 5% or less of Market Value of Assets.

C. Amortization Method

- (1) A level percent of payroll amortization method shall be used to systematically pay off the unfunded actuarial accrued liabilities over a closed amortization period not to exceed 20 years.
- (2) The amortization period for unfunded accrued liabilities shall be set in a manner to ensure that the plan will be 100% funded as soon as reasonably possible. Starting in conjunction with the actuarial valuation dated June 30, 2018 (determines contribution for Fiscal Year 2020), the amortization period shall be decreased by one (1) year annually beginning with a ten (10) year closed amortization period. The Administrative Committee may elect to create a new ten (10) year amortization schedule for unfunded liabilities arising during that valuation and subsequent valuations (multiple layer amortization), and to continue the amortization of preexisting unfunded liabilities to their scheduled end date.
- (3) Unfunded liabilities arising from benefit changes provided to retirees or in conjunction with early retirement incentive programs offered by the employer may be separately funded over a closed amortization period of 5 years at the discretion of the Administrative Committee.
- (4) In the event that the Retirement Plans' assets exceed its liabilities, all amortization schedules shall be considered completed, and employer contributions will be set based upon the normal cost, without regard to the overfunding status of the Retirement Plans.

D. Assumptions

- (1) The economic and demographic actuarial assumptions utilized to determine the contribution requirements and benefit values of the Retirement Plans shall be determined by the Administrative Committee in consultation with its actuary, subject to the following limitations:
 - (a) The assumed rate of investment return shall not exceed 8.0%, compounded annually.

E. Funding Target

- (1) The targeted funded ratio of the Retirement Plans shall be 100%.
- (2) The employer contribution rate shall at least be equal to the normal cost unless the funded ratio of the Retirement Plans exceeds 120%.
- (3) A funding plan shall be developed by the Administrative Committee in consultation with its actuary if the funded ratio of the Retirement Plans falls below 60%, which may include additional funding requirements.

F. Risk Management

- (1) Assumption Changes
 - (a) The actuarial assumptions utilized to determine the annual contribution requirements and valuations shall be those last adopted by the Administrative Committee based on the most recent experience study and upon the advice and recommendation of the Administrative Committee's actuary. The Administrative Committee's actuary shall conduct an experience study at least once every five years. The results of the experience study shall be the basis for the actuarial assumptions recommended to the Administrative Committee.
 - (b) The actuarial assumptions may be revised during the five-year period between experience studies if significant plan design changes or other significant events occur, as advised by the actuary.

- (2) Risk Measures. The following risk measures will be annually determined by the Retirement Plans' actuary to provide quantifiable measurements of risk as it applies to the Retirement Plans.
 - (a) Funded ratio;
 - (b) Unfunded actuarial accrued liabilities – the years required to pay down the unfunded liabilities of the Retirement Plans based upon the current funding schedule;
 - (c) Total unfunded actuarial accrued liabilities as a percentage of total payroll;
 - (d) Total market value of assets as a percentage of total payroll;
 - (e) Total actuarial accrued liabilities as a percentage of total payroll;
 - (f) Total retired to active life actuarial accrued liabilities; and
 - (g) Ratio of net cash flow to market value of assets.
- (3) Risk Control
 - (a) The Administrative Committee shall carefully monitor the risk measures identified above and shall consider steps to mitigate risk, particularly as the funded ratio increases.

IV. REVIEW AND AMENDMENT

A. Periodic Review

- (1) This Actuarial Funding Policy shall be reviewed no less frequently than once every five years in conjunction with the required experience study performed by the Administrative Committee's actuary, and may be reviewed at any time at the Administrative Committee's discretion.

B. Amendment

- (1) The Administrative Committee, in consultation with its Actuary and Legal Counsel, may amend this Actuarial Funding Policy at any time as deemed necessary to address changes in the makeup, benefit structure and/or funding status of the Retirement Plans.

Risk Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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 due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. **Other demographic risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution rate shown on page 4 may be considered as a minimum contribution rate that complies with the City's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	<u>2019</u>	<u>2018</u>
Ratio of the market value of assets to total payroll	5.7	5.9
Ratio of actuarial accrued liability to payroll	6.9	6.9
Ratio of actives to retirees and beneficiaries	1.1	1.2
Ratio of net cash flow to market value of assets	-3.8%	-3.3%

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time. The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.



September 30, 2019

Mr. David Hodgkins
Asst. City Manager/ City Finance Director
City of Fairfax
10455 Armstrong Street, Suite 312
Fairfax, Virginia 22030

**Re: City of Fairfax Retirement Plan for Public Safety Employees Report of June 30, 2019
Actuarial Valuation**

Dear Mr. Hodgkins:

Please find enclosed ten copies of the 37th Annual Actuarial Valuation for the City of Fairfax Retirement Plan for Public Safety Employees.

Sincerely,

A handwritten signature in black ink that reads "Heidi G. Barry". The signature is written in a cursive style with a stylized initial "H".

Heidi G. Barry, ASA, FCA, MAAA

HGB:ah
Enclosures