

Fairfax County Employees' Retirement System

**Actuarial Valuation
as of June 30, 2018**

Produced by Cheiron

October 2018

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October 16, 2018

Board of Trustees
Fairfax County Employees' Retirement System
12015 Lee Jackson Memorial Hwy
Suite 350
Fairfax, Virginia 22033

**Re: *Fairfax County Employees' Retirement System
Actuarial Valuation as of June 30, 2018***

Dear Members of the Board:

At your request, we have conducted our annual actuarial valuation of the Fairfax County Employees' Retirement System as of June 30, 2018. The results of the valuation are contained in this report. The purpose of this report is to present the annual actuarial valuation of the Fairfax County Employees' Retirement System. This report is for the use of the Fairfax County Employees' Retirement System Board of Trustees and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report. We also comment on the sources and reliability of both the data and the actuarial assumptions on which our findings are based. Those comments are the basis for our certification that this report is complete to the best of our knowledge and belief. The results of this report are only applicable to the employer contribution for Fiscal Year 2020 and rely on future plan experience conforming to the underlying assumptions. To the extent that actual plan experience deviates from the underlying assumptions, the results would vary accordingly.

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 assumptions, changes in assumptions, and changes in plan provisions or applicable law.

In preparing our report, we relied on information (some oral and some written) supplied by the Retirement System. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23.

This report was prepared exclusively for the Fairfax County Employees' Retirement System for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

We hereby certify that, to the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards

Board of Trustees
Fairfax County Employees' Retirement System
October 16, 2018
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of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinions contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

Sincerely,
Cheiron



Fiona E. Liston, FSA, MAAA, EA
Principal Consulting Actuary



Coralie A. Taylor, FSA, MAAA, EA
Associate Actuary

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

FOREWORD

Cheiron has performed the actuarial valuation of the Fairfax County Employees' Retirement System as of June 30, 2018. The purpose of this report is to:

- 1) **Measure and disclose**, as of the valuation date, the financial condition of the System;
- 2) **Indicate trends** in the financial progress of the System;
- 3) **Determine the contribution rate** to be paid by the employer for Fiscal Year 2020; and
- 4) **Provide specific information** and documentation required for the System's financial reporting.

An actuarial valuation establishes and analyzes system assets and liabilities on a consistent basis and traces the progress of both from one year to the next. It includes measurement of the system's investment performance as well as an analysis of actuarial liability gains and losses.

Section I presents a summary containing our findings and disclosing important trends experienced by the System in recent years.

Section II contains details on various asset measures, together with pertinent performance measurements.

Section III shows similar information on the System's liabilities, measured for actuarial, accounting, and governmental reporting purposes.

Section IV develops the employer contribution rate, determined using actuarial techniques and compares that to the rate developed using the corridor method of funding.

Section V includes the required items to be included in the System's Comprehensive Annual Financial Report (CAFR).

The appendices to this report contain a summary of the System's membership at the valuation date, a summary of the major provisions of the System, and the actuarial methods and assumptions used in the valuations.

In preparing our report, we relied on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23.

The actuarial assumptions reflect our understanding of the likely future experience of the System, and the assumptions taken individually represent our best estimate for the future experience of the System. The results of this report are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the true cost of the System could vary from our results.

Finally, in preparing this report, we have conformed to generally accepted actuarial principles and practices, which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

General Comments

The employer's annual contribution to this System is determined by using a corridor funding method. Under this funding approach, the employer's contribution base rate consists of the normal cost rate plus expense rate plus certain amortization UAL bases. The UAL base rates are summarized in Section IV. The normal cost rate and actuarial accrued liability will be measured using the entry age funding method. If the corridor funded status falls outside the corridor, a credit (if above 120%) or charge (if below 100%) will be established based on a fixed 15-year amortization equal to the amount necessary to re-enter the corridor. The County has taken steps to increase the initial 90% floor to 100%. In this valuation the 100% floor has been reached.

The employer contribution rate for Fiscal Year (FY) 2020, as calculated under this method, increased from 21.15% for FY 2019 to 21.66% of payroll when using the 90% corridor floor. The County's FY 2019 contribution was actually based on a 99% corridor floor, and for FY 2020 on a 100% floor. On that basis, the contribution in FY 2019 was 27.14%, and for FY 2020, it will be 28.35%.

This valuation contains information reported in the June 30, 2018 Comprehensive Annual Financial Report (CAFR) of the System. Additional information regarding GASB Statement No. 67 can be found in a separate report.

Trends

The System made its 7.25% investment assumption during the fiscal year ending in 2018. The actual return on a market value basis was 7.26%. On an actuarial value basis, the assets returned 5.59% compared with an assumed rate of return of 7.25%. The actuarial loss recognized for funding purposes was \$64.8 million.

The measurement of liabilities produced a loss this year in the amount of \$41.4 million. This was due to experience compared to our assumptions about salary increases, retirement behavior, COLA, and death, etc. Specific components of the loss include:

- The average salary increase was 6.4% for active participants who were in both the June 30, 2017 and June 30, 2018 valuations. This was more than expected based on the actuarial assumption, creating a liability loss of \$29.6 million.
- The valuation assumed a 2.50% cost-of-living adjustment in 2017 for benefits in pay status. The actual CPI-based COLA was 1.80% last year, creating a liability gain of \$20.8 million.
- An annual component of liability loss is the delayed recognition of new hires throughout the year. This does not contribute to an increase in the System's unfunded liability because both the member and employer contribute from the date of hire. However, when we look only at the liability side, they are a component of the annual liability loss. They account for a \$5.2 million loss this year.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

- Finally, there was a \$27.3 million liability loss component that is made up of various other causes such as members terminating, retiring, dying, or becoming disabled in a way contrary to the assumption, and on retirees and terminated vested members who were not in the 2017 data in that status.

This valuation report also reflects a plan change to reduce the Social Security offset applied to certain disability benefits, which increased liabilities by \$0.6 million. The County will make an additional contribution in FY 2019 to pay for this change.

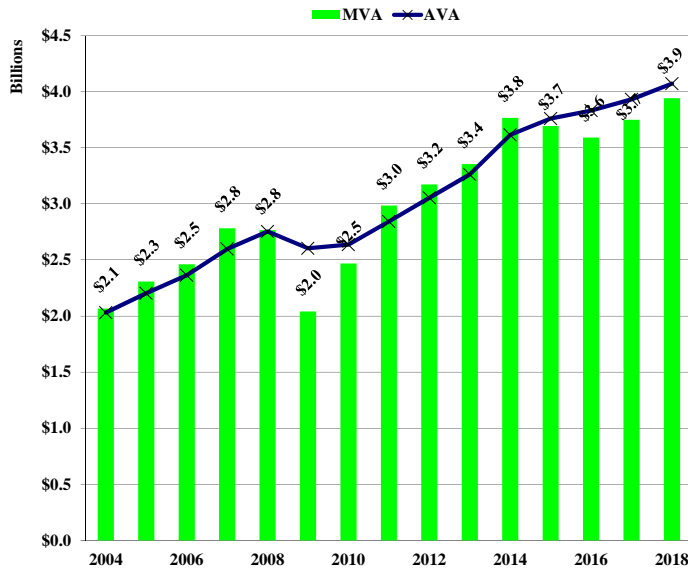
The combination of liability and investment experience and plan changes, together with County plus member contributions over the last year, led to the System's funding ratio (actuarial value of assets over actuarial accrued liability) decreasing from 73.2% at June 30, 2017 to 72.8% at June 30, 2018. For purposes of measuring whether the System remains within the funding corridor, an adjusted funding ratio is used. In this ratio, there is an additional asset recognized in the amount of the unfunded actuarial liability payments being made by the County to pay for benefit increases and assumption changes. On this basis, the System's actuarial funded ratio decreased from 76.6% at June 30, 2017 to 75.8% at June 30, 2018.

It is important to take a step back from the latest results and view them in the context of the System's recent history. On the next three pages, we present a series of charts that display key factors in the valuations over the last 15 years. After the historical review, we present a few projection graphs, showing the possible condition of the System over the next 15 years under various market return scenarios.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Growth in Assets

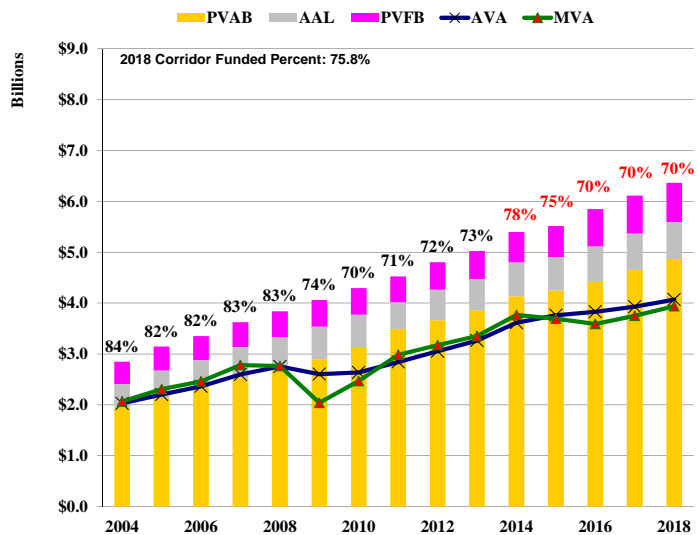


There was an increase in the market value of assets (MVA) (amount in billions shown above bars) over last year due to a return of 7.26%. The actuarial value of assets (AVA) increased due to the continued recognition of past asset gains. The System recognized only a third of the asset gain this year and there remains \$130 million in unrecognized losses that will be phased in over the next few years.

Over the period July 1, 2004 to June 30, 2018, the System's assets returned approximately 6.98% per year measured at actuarial value, compared to the valuation assumption of 7.25% per year.

Assets and Liabilities

The three colored bars represent the three different measures of liability mentioned in this report. The amount represented by the top of the pink bars, the present value of future benefits (PVFB), is the amount needed to provide all benefits for the current participants and their beneficiaries. For funding purposes, the target amount is represented by the top of the gray bar. Through the 2013 valuation, we compare the actuarial value of assets to this measure of liability in developing the funded percent (black numbers). Starting in 2014, the comparison uses the market value of assets (red numbers). These are the percentages shown in the graph labels.

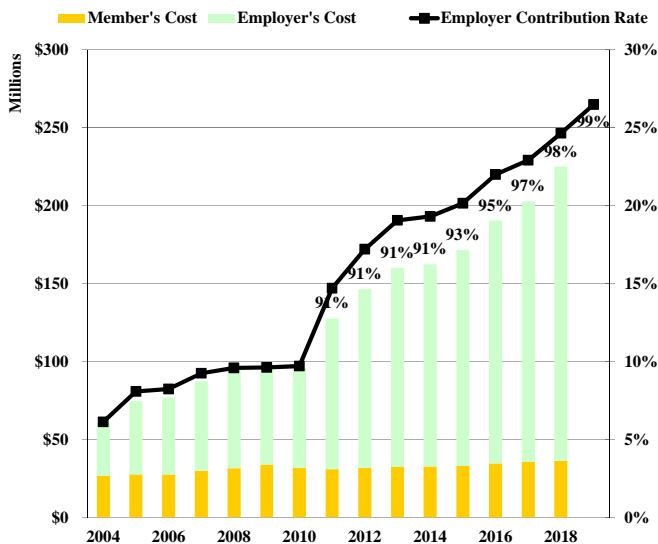


**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Contribution Rates

The stacked bars in this graph show the contributions made by both the County and the members (left hand scale). The black line shows the County contribution rate as a percent of payroll (right hand scale).

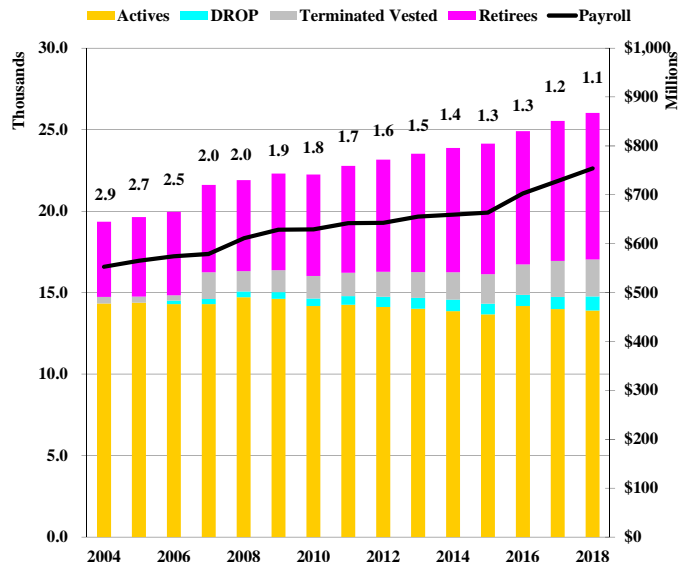


The member contribution rate is set by the County Ordinance. The County contribution rate is set by the actuarial process, as constrained by the corridor method. Note there is a lag in the rate shown. For example, the 2018 value is the rate prepared by the 2016 valuation and implemented for the period June 30, 2017 to June 30, 2018. Starting with FY 2011, the County contribution has been based on a corridor floor greater than 90%. The data labels show the change in this metric.

Participant Trends

As with many systems in this country, there has been a steady growth in the number of retired members as the System has matured. The active-to-inactive ratio has decreased from 2.9 actives to each inactive in 2004 to 1.1 actives for each inactive today. While this would be an alarming trend in a pay-as-you-go system, the pool of invested assets has been established in anticipation of this development.

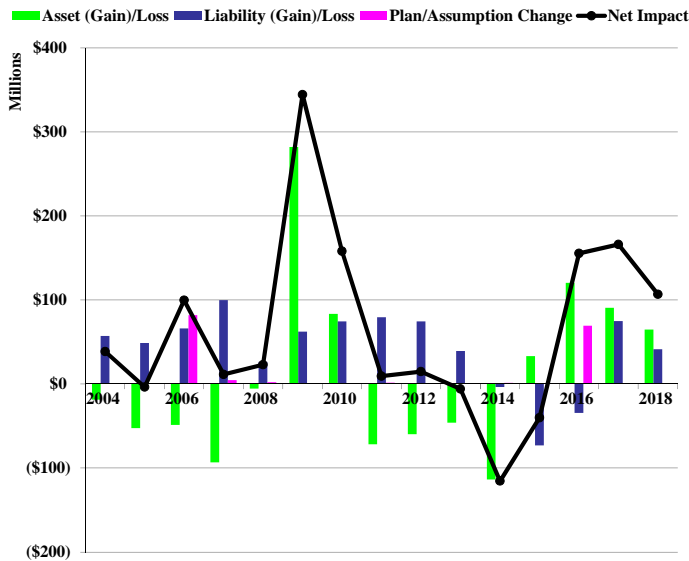
Starting in 2006, the chart also shows the number of DROP participants. Neither employer nor member contributions are made on their behalf, which leads to a slightly lower growth in effective covered payroll for this System.



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

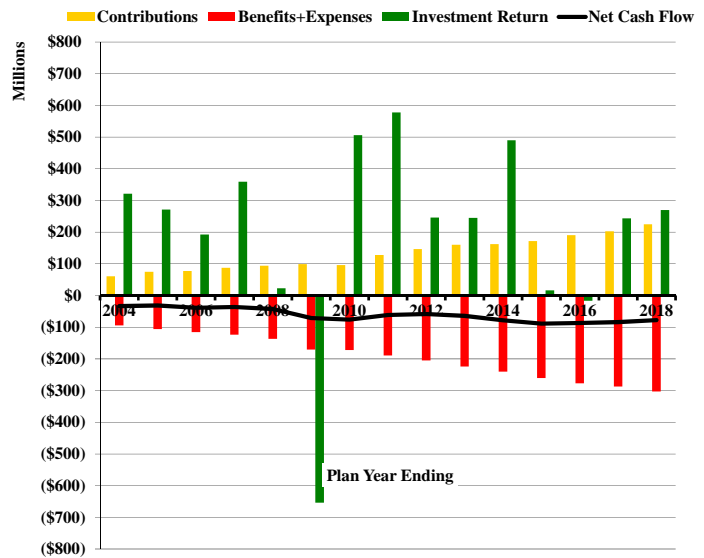
Gains and Losses



This graph shows the annual gains and losses experienced by the System, along with the change in unfunded actuarial liability (UAL) due to plan amendments and changes in assumptions. The black line shows the net impact of all such changes in a given year. Positive numbers represent increases in the UAL, while negative numbers show reductions.

Cash Flow

The graph shows the annual cash flows into and out of the System. The graph shows the magnitude of the investment returns on the market value (green bars) compared to the contributions (yellow bars). The net cash flow (line) is comparing the contributions to benefits and expenses (red bar). Negative cash flow is expected for a mature system such as this one. The implications of a system with negative cash flow are that the impact of market fluctuations can be more severe. This is because, as assets are being depleted to pay benefits in down markets, less principal is available to be reinvested during periods of favorable returns.



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

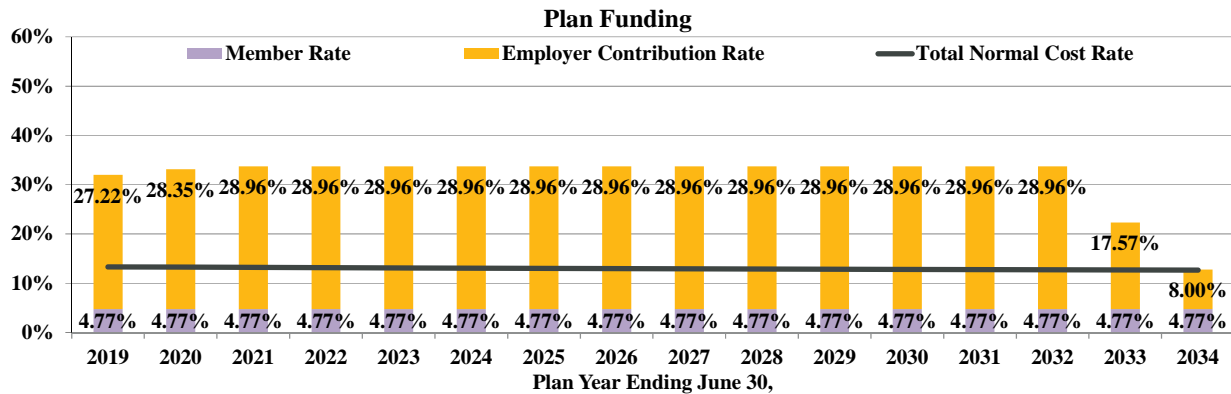
Future Outlook

Base-line Projections

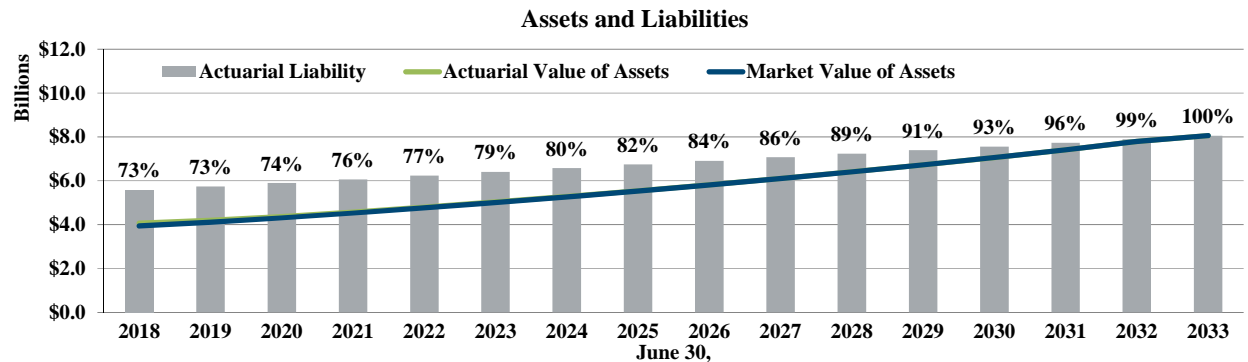
The two graphs below show the expected progress of the System over the next 15 years, assuming the System's assets earn 7.25% on their *market value*.

The floor of the County's corridor contribution calculation was increased to 99% for FY 2019. In FY 2020, the amortization target could range from 99% to 100% and will then continue at the amortization target of 100%. In addition to the increasing corridor floor, the County does not intend to reduce the contribution rate until the System is 100% funded.

The graph entitled "Plan Funding" illustrates the FY 2020 floor at 100%.



The "Assets and Liabilities" graph shows the projected funding status over the next 15 years. The funded ratio based on the actuarial value of assets gradually increases for the entire projection period ultimately reaching 100% funded as of 2033.



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
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SECTION I – BOARD SUMMARY

The future funding status of this System will be influenced by the investment earnings. The prior projection assumed the System would earn 7.25% each and every year, which is extremely unlikely.

In the projections that follow, we show the risk to the System under volatile markets. The System has averaged an 8.09% return per year since 1994. In the following charts, we show results assuming returns over the next 15 years average 4.75%, 7.25%, and 9.75%. Different patterns of returns will produce different results from those shown here.

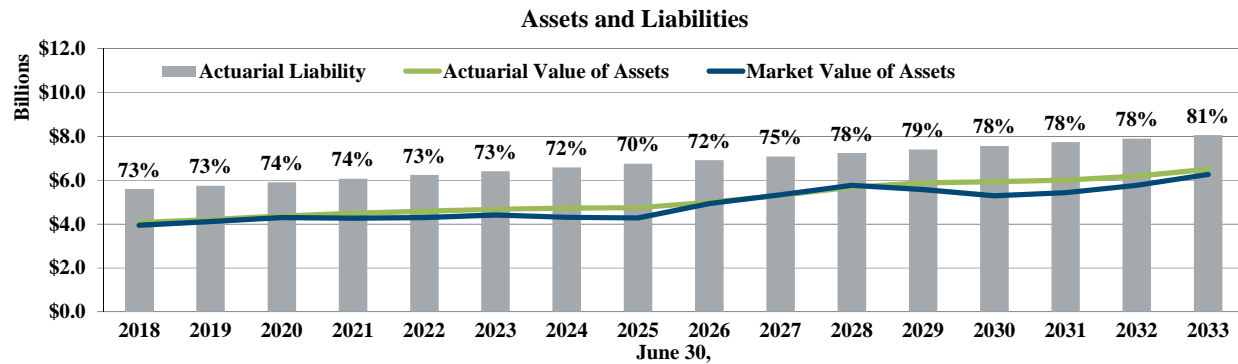
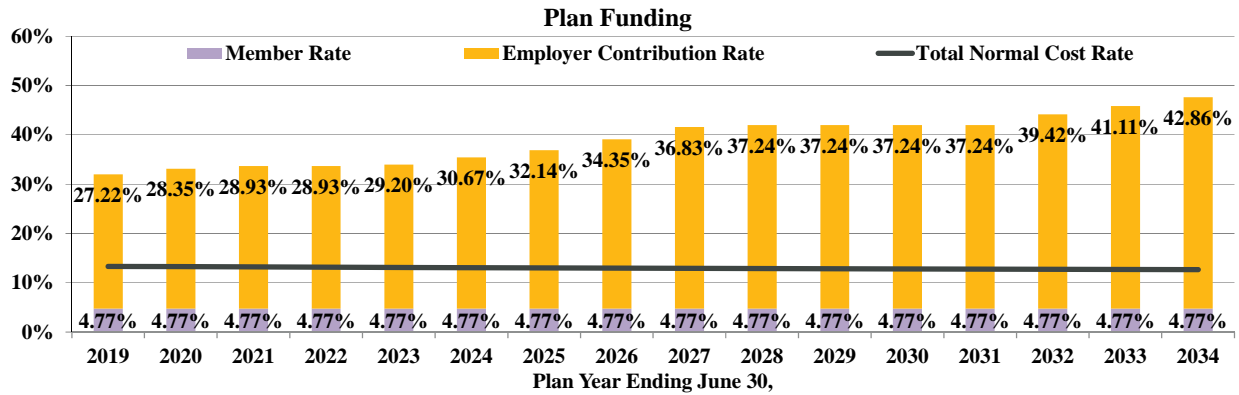
Table I-1			
Fiscal Year Ending June 30,	Average 4.75%	Average 7.25%	Average 9.75%
2019	7.42%	2.09%	(6.10)%
2020	6.80	6.92	4.29
2021	1.42	17.47	17.90
2022	2.73	29.76	32.31
2023	4.91	19.17	(9.23)
2024	(0.44)	5.36	10.22
2025	1.23	10.78	15.56
2026	17.34	4.05	(12.69)
2027	9.25	15.35	14.94
2028	9.00	(0.69)	14.58
2029	(2.36)	1.80	30.53
2030	(4.00)	(8.62)	24.67
2031	3.95	4.40	3.70
2032	7.02	(0.84)	7.12
2033	8.92	7.58	9.97
Average	4.75%	7.25%	9.75%

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Alternative Projection – with average return of 4.75% in the period

Under this scenario, the corridor contribution rate increases from 27% to about 43% of pay. The System's funding drops to as low as 70% on an actuarial value basis, even with the ramping up of contributions.

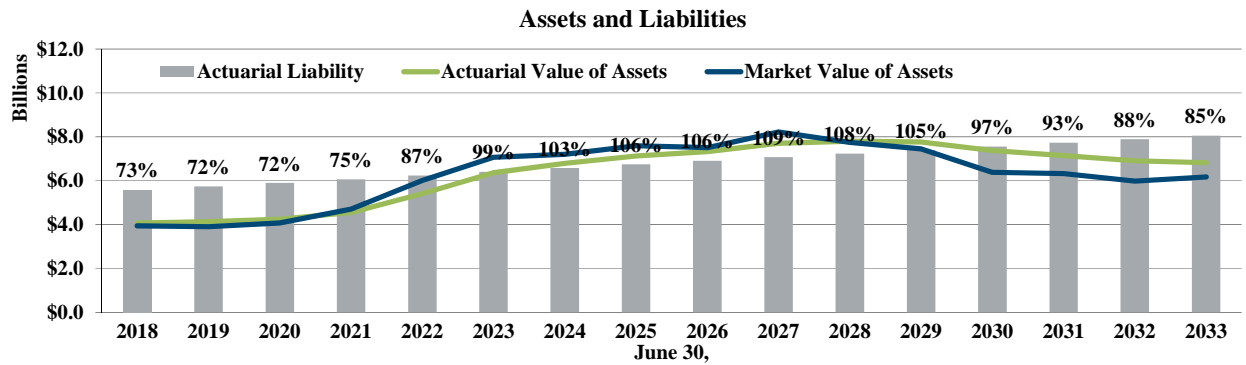
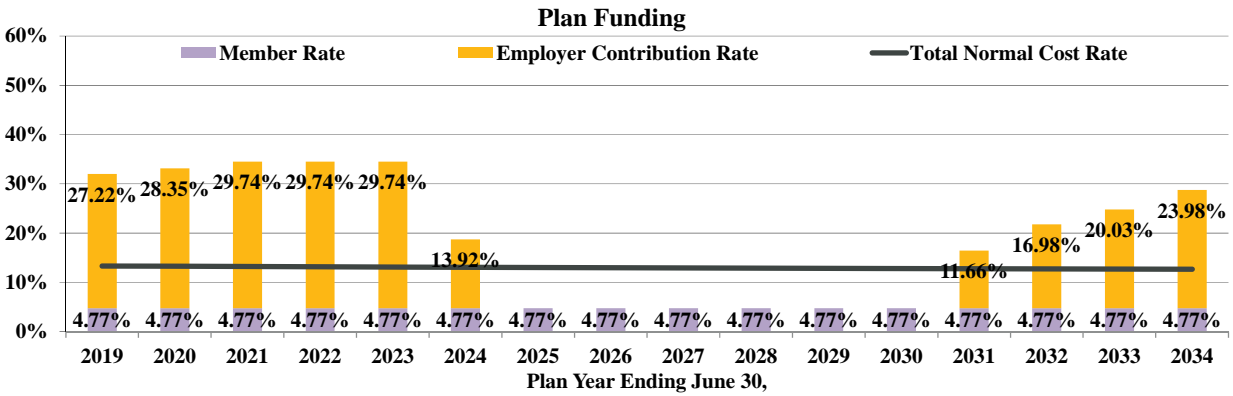


**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Alternative Projection – with average return of 7.25% in the period

Under this scenario, in which the System is assumed to experience lower than expected for the first two years followed by higher than average returns in the next few years, the corridor contribution rate increases over the next few years as the asset losses are phased in and the funding ratio remains below 100%. After that time, the contribution drops dramatically as returns continue to push the funded percent well above 100% on an actuarial value basis.

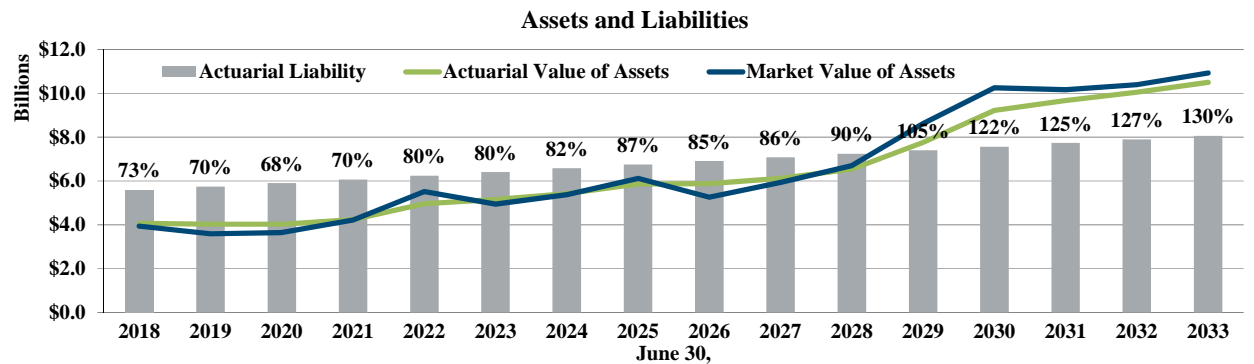
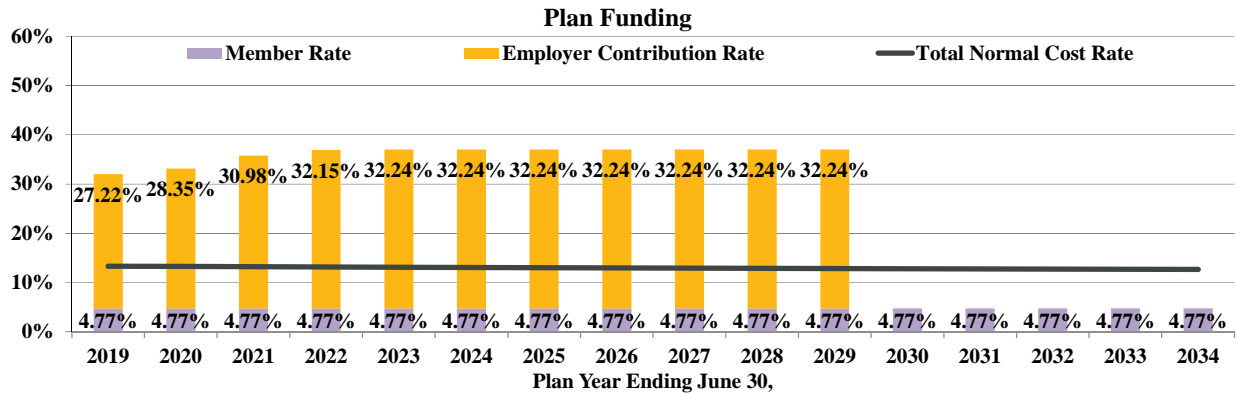


**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Alternative Projection – with average return of 9.75% in the period

Under this scenario, in which the System is assumed to face lower returns in the first two years but significantly higher returns thereafter, the corridor contribution rate increases while phasing in the poor asset returns, holds at 32.24% and then drops off once the System reaches 100% funding on an actuarial value basis.



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Table I-2 Summary of Principal Plan Results			
Valuation as of:	June 30, 2017	June 30, 2018	% Chg.
<u>Participant Counts</u>			
Actives (excluding DROP)	13,986	13,904	(0.6)%
DROPs	745	858	15.2%
Terminated Vesteds	2,207	2,269	2.8%
In Pay Status	8,603	8,989	4.5%
Total	25,541	26,020	1.9%
Annual Salaries of Active Members	\$ 728,022,176	\$ 754,080,802	3.6%
Annual Retirement Allowances for Retired Members and Beneficiaries (Base amount only – not supplements)	\$ 220,086,897	\$ 233,790,338	6.2%
<u>Assets and Liabilities</u>			
Actuarial Accrued Liability (AAL)	\$ 5,367,731,521	\$ 5,591,223,791	4.2%
Assets for Valuation Purposes (AVA)	3,930,924,191	4,070,486,587	3.6%
Unfunded Actuarial Liability	\$ 1,436,807,330	\$ 1,520,737,204	5.8%
Actuarial Value Funding Ratio (AVA / AAL)	73.2%	72.8%	
Market Value Funding Ratio (MVA / AL)	69.9%	70.5%	
Present Value of Accrued Benefits	\$ 4,653,102,374	\$ 4,867,108,012	4.6%
Market Value of Assets	3,749,384,616	3,940,926,716	5.1%
Unfunded Accrued Liability (not less than \$0)	\$ 903,717,758	\$ 926,181,296	2.5%
Accrued Benefit Funding Ratio	80.6%	81.0%	
<u>Contributions as a Percentage of Payroll</u>			
	Fiscal Year 2019	Fiscal Year 2020	
<u>Corridor Method:</u>			
Normal Cost Contribution	8.54%	8.48%	
Increase Due to Amortized Changes	3.42%	3.42%	
Administrative Expense	0.25%	0.25%	
Base Rate	12.21%	12.15%	
Amortize to 99%	27.14% ¹	27.68%	
Amortize to 100%	27.80%	28.35%	

¹The contribution rate currently being paid by the County in FY 2019 is 27.22%, which is based on the amortize to 99% amount shown above, with an additional amount to pay for the disability change.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Pension system assets play a key role in the financial operation of the System and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact benefit levels, employer contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on the System's assets including:

- **Disclosure** of the System's assets at June 30, 2017 and June 30, 2018,
- Statement of the **changes** in market values during the year,
- Development of the **actuarial value of assets**,
- An assessment of **investment performance**, and
- A projection of the System's expected **cash flows** for the next 10 years.

Disclosure

The market value of assets represents "snap-shot or cash-out" values, which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not suitable for long-range planning.

The actuarial values are market values that have been smoothed; they are used for evaluating the System's ongoing liability to meet its obligations.

Current methods employed by this system set the actuarial value equal to the expected value plus 33 $\frac{1}{3}$ % of the difference between the expected value of assets and the actual market value, where the expected value is equal to the prior year's actuarial value, rolled forward with actual contributions, benefit payments, and administrative expenses plus interest imputed at the prior year investment return assumption of 7.25%.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Table II-1		
Statement of Assets at Market Value		
	June 30, 2017	June 30, 2018
<u>Assets</u>		
Equity in County's Pooled Cash,		
Contributions Receivable and Other Assets	\$ 14,759,227	\$ 15,936,979
Accrued Interest and Dividends Receivable	12,333,378	9,574,475
Receivable from Sale of Investments	204,271,731	165,292,696
Capital Assets	0	53,376
US Government Obligations	128,353,539	201,900,499
Asset-Backed Securities	136,013,943	133,941,741
Other Bonds and Notes	371,663,379	351,802,792
Common and Preferred Stock	886,989,134	865,717,015
Pooled and Mutual Funds	1,924,097,215	2,095,452,749
Short-Term Investments	263,674,511	279,312,960
Cash Collateral Received Under Securities Lending Agreements	222,297,561	129,947,304
Total Assets	\$ 4,164,453,618	\$ 4,248,932,586
<u>Liabilities</u>		
Payable for Collateral Received Under Securities Lending Agreements	\$ 222,297,561	\$ 129,947,304
Payable for Purchase of Investments	183,752,985	168,779,495
Accounts Payable and Accrued Expenses	9,018,456	9,279,071
Total Liabilities	\$ 415,069,002	\$ 308,005,870
Net Assets Available for Benefits	\$ 3,749,384,616	\$ 3,940,926,716

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Table II-2 Changes in Market Values		
Value of Assets – June 30, 2017		\$ 3,749,384,616
<u>Additions</u>		
Contributions:		
Employer Contributions	\$ 188,578,414	
Employee Contributions	<u>36,357,591</u>	
Total Contributions		\$ 224,936,005
Investment Income:		
Net Appreciation (Depreciation) in Fair Value of Investments	\$ 237,952,310	
Interest	49,941,732	
Dividends	<u>18,865,368</u>	
Total Investment Income		\$ 306,759,410
Investment Activity Expenses:		
Management Fees	\$ (37,071,470)	
Custodian Fees	(136,775)	
Consulting Expense	(78,696)	
Allocated Administrative Expenses	<u>(1,095,398)</u>	
Total Investment Activity Expenses		\$ (38,382,339)
From Securities Lending Activities:		
Securities Lending Income	\$ 3,455,272	
Securities Lending Expenses		
Borrowers Rebates	0	
Management Fees	<u>(2,414,186)</u>	
Net Income from Securities Lending Activities		\$ 1,041,086
Net Investment Income		<u>\$ 269,418,157</u>
Total Additions		\$ 494,354,162
<u>Deductions</u>		
Annuity Benefits	\$ (281,675,071)	
Disability Benefits	(7,881,062)	
Survivor Benefits	(6,698,896)	
Refunds and Other Expenses	(4,386,395)	
Administrative Expenses	<u>(2,170,638)</u>	
Total Deductions		<u>\$ (302,812,062)</u>
<u>Total</u>		
Net Increase (Decrease)		<u>\$ 191,542,100</u>
Value of Assets – June 30, 2018		\$ 3,940,926,716

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Actuarial Value of Assets

The actuarial value of assets represents a “smoothed” value developed by the actuary to reduce or eliminate erratic results, which could develop from short-term fluctuations in the market value of assets. For this system, the actuarial value has been calculated by adding 33⅓% of the difference between market value and expected value to the expected value. The following table illustrates the calculation of actuarial value of assets for the June 30, 2018 valuation.

Table II-3 Development of Actuarial Value of Assets as of June 30, 2018	
1. Actuarial Value of Assets at June 30, 2017	\$ 3,930,924,191
2. Amount in (1) with Interest to June 30, 2018	4,215,916,195
3. Employer and Member Contributions for the Plan Year Ended June 30, 2018	224,936,005
4. Interest on Contributions Assuming Received Uniformly Throughout the Year to June 30, 2018	8,011,267
5. Disbursements from Trust Except Investment Expenses, July 1, 2017 Through June 30, 2018	(302,812,062)
6. Interest on Disbursements Assuming Payments Made Uniformly Throughout the Year to June 30, 2018	(10,784,882)
7. Expected Value of Assets at June 30, 2018 = (2) + (3) + (4) + (5) + (6)	4,135,266,523
8. Market Value of Assets at June 30, 2018	<u>3,940,926,716</u>
9. Excess of (8) Over (7)	\$ (194,339,807)
10. Actuarial Value of Assets at June 30, 2018 = (7) + 33-1/3% of (9)	\$ 4,070,486,587

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Investment Performance

The market value of assets (MVA) returned 7.26% during 2018, which is slightly more than the assumed 7.25% return. A return of 5.59% on the actuarial value of assets (AVA) is primarily the result of the asset smoothing method being utilized for the calculation of the actuarial value of assets. Since only 33⅓% of the gain or loss from the performance of the System is recognized in a given year, in periods of very good performance, the AVA can lag significantly behind the MVA. In a period of negative returns, the AVA does not decline as rapidly as the MVA.

**Table II-4
Annual Rates of Return**

Year Ending June 30,	Market Value	Actuarial Value	Total Return Standard & Poor's 500 Index	Barclays Global Aggregate Index¹
1994	5.8%	8.9%	1.3%	(1.5)%
1995	13.1%	10.7%	26.1%	12.8%
1996	15.9%	25.0% ²	26.0%	4.7% ³
1997	20.1%	10.2%	34.7%	8.2%
1998	17.2%	7.7%	30.2%	10.5%
1999	8.5%	16.0%	22.8%	3.1%
2000	5.8%	12.2%	7.2%	4.6%
2001	(0.5)%	7.6%	(14.8)%	11.2%
2002	(4.2)%	3.7%	(18.0)%	8.6%
2003	5.2%	4.1%	0.3%	10.4%
2004	18.2%	8.5%	19.1%	0.3%
2005	13.2%	10.1%	6.3%	6.8%
2006	8.4%	9.7%	8.6%	(0.8)%
2007	14.7%	11.5%	20.6%	6.1%
2008	0.8%	7.7%	(13.1)%	7.1%
2009	(24.0)%	(2.9)%	(26.2)%	5.5%
2010	25.3%	4.3%	14.4%	9.5%
2011	23.7%	10.3%	30.8%	3.9%
2012	8.3%	9.6%	5.4%	7.5%
2013	7.8%	9.0%	20.6%	(0.1)%
2014	14.8%	10.9%	24.6%	4.4%
2015	0.4%	6.6%	7.4%	1.8%
2016	(0.5)%	4.3%	4.0%	6.0%
2017	6.8%	4.8%	17.9%	(0.3)%
2018	7.3%	5.6%	12.2%	0.8%

¹ Formerly the Lehman Global Aggregate Bond Index.

² The actuarial return in 1996 reflects the adjustment to a revised actuarial valuation method.

³ Figures shown prior to 1997 are Shearson Lehman Government/Corporate Bond Index.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Expected benefit payments are projected for the closed group valued at June 30, 2018. Projecting any further than 10 years using a closed group would not yield reliable predictions due to the omission of new hires.

Expected employer contributions are projected based on the current County contribution rate of 27.22% for FY 2019, and then using the amortize to 100% rate for FY 2020 and thereafter. This projection assumes no further gains or losses, a 2.75% annual increase in the total covered payroll and models the anticipated impact of new hires coming in with altered plan provisions.

Table II-5		
Projection of System's Benefit Payments and County Contributions		
Year Beginning	Expected	Expected
<u>July 1,</u>	<u>Benefit Payments</u>	<u>County Contributions</u>
2018	\$ 348,318,000	\$ 205,261,000
2019	351,115,000	219,629,000
2020	359,916,000	225,669,000
2021	363,926,000	231,874,000
2022	381,542,000	238,251,000
2023	397,515,000	244,803,000
2024	413,215,000	251,535,000
2025	429,490,000	258,452,000
2026	445,811,000	265,560,000
2027	461,904,000	272,863,000

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION III – LIABILITIES

In this section, we present detailed information on system liabilities including:

- **Disclosure** of system liabilities at June 30, 2017 and June 30, 2018,
- Statement of **changes** in these liabilities during the year, and
- A **projection** of future liabilities.

Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of Benefits:** Used for analyzing the financial outlook of the System. This represents the amount of money needed today to fund all future benefits and expenses of the System, assuming participants continue to accrue benefits and all assumptions are met.
- **Actuarial Accrued Liability:** Used for funding calculations and GASB disclosures. This liability is calculated taking the present value of benefits above and subtracting the present value of future member contributions and future employer normal costs under an acceptable actuarial funding method. This method is referred to as the **Entry Age Normal** funding method.
- **Present Value of Accrued Liabilities:** Used for communicating the current level of liabilities. This liability represents the total amount of money needed today to fully fund the current accrued obligations of the System, assuming no future accruals of benefits and that all assumptions are met, including the 7.25% investment return. These liabilities are also used to assess whether the System can meet its current benefit commitments.

None of the liability figures disclosed in this report is meant to be a measure of the System's settlement liability.

The following table discloses each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of the System's assets yields, for each respective type, a **net surplus** or an **unfunded liability**.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION III – LIABILITIES

Table III-1		
Liabilities/Net (Surplus)/Unfunded		
	June 30, 2017	June 30, 2018
Present Value of Future Benefits		
Active Participant Benefits (excluding DROP)	\$ 2,897,443,152	\$ 2,920,573,245
DROP Participant Benefits	495,716,476	574,811,839
Retiree Benefits	2,608,361,852	2,756,179,621
Terminated Vested and Inactive Members	112,401,724	113,012,897
Present Value of Benefits (PVB)	\$ 6,113,923,204	\$ 6,364,577,602
Market Value of Assets (MVA)	\$ 3,749,384,616	\$ 3,940,926,716
Future Employee Contributions	262,281,194	274,543,175
Future County Contributions	2,102,257,394	2,149,107,711
Total Resources	\$ 6,113,923,204	\$ 6,364,577,602
Actuarial Accrued Liability		
Present Value of Benefits (PVB)	\$ 6,113,923,204	\$ 6,364,577,602
Present Value of Future Normal Costs (PVFNC)		
County Portion	483,910,489	498,810,636
Employee Portion	262,281,194	274,543,175
Actuarial Accrued Liability (AAL = PVB - PVFNC)	\$ 5,367,731,521	\$ 5,591,223,791
Actuarial Value of Assets (AVA)	\$ 3,930,924,191	\$ 4,070,486,587
Net (Surplus)/Unfunded (AAL – AVA)	\$ 1,436,807,330	\$ 1,520,737,204
Present Value of Accrued Benefits		
Present Value of Benefits (PVB)	\$ 6,113,923,204	\$ 6,364,577,602
Present Value of Future Benefit Accruals (PVFBA)	1,460,820,830	1,497,469,590
Present Value of Accrued Benefits (PVAB = PVB – PVFBA)	\$ 4,653,102,374	\$ 4,867,108,012
Market Value of Assets (MVA)	\$ 3,749,384,616	\$ 3,940,926,716
Net Unfunded, not less than \$0 (PVAB – MVA)	\$ 903,717,758	\$ 926,181,296

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION III – LIABILITIES

Changes in Liabilities

Each of the liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments increasing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above and due to changes in system assets resulting from the following:

- Employer contributions less than the full actuarial contribution
- Investment earnings different than expected
- A change in the method used to measure system assets

In each valuation, we report on those elements of change that are of particular significance, potentially affecting the long-term financial outlook of the System. Below we present key changes in liabilities since the last valuation.

Table III-2			
	Present Value of Benefits	Actuarial Accrued Liability	Present Value of Accrued Benefits
Liabilities June 30, 2017	\$ 6,113,923,204	\$ 5,367,731,521	\$ 4,653,102,374
Liabilities June 30, 2018	<u>6,364,577,602</u>	<u>5,591,223,791</u>	<u>4,867,108,012</u>
Liability Increase (Decrease)	\$ 250,654,398	\$ 223,492,270	\$ 214,005,638
Change Due to:			
Plan Amendment	\$ 665,421	\$ 603,265	\$ 650,292
Actuarial (Gain)/Loss	<i>Not Calculated</i>	41,362,698	<i>Not Calculated</i>
Method and Assumption Changes	0	0	0
Benefits Accumulated and Other Sources	249,988,977	181,526,307	213,355,346

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION IV – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension system, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the system. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that is both stable and predictable.

For this system, the funding method employed is the **Entry Age Actuarial Cost Method**. Under this method, there are three components to the total contribution: the **normal cost rate**, the **unfunded actuarial liability rate** (UAL rate), and the **administrative expense rate**. The normal cost rate is determined in the following steps. First, an individual normal cost rate is determined by taking the value, as of entry age into the System, of each member's projected future benefits. This value is then divided by the value, also at entry age, of the member's expected future salary. Second, the normal cost rate is multiplied by current salary and added together to obtain the total System normal cost. This is divided by total salary to convert it to the total system normal cost rate. Finally, the total normal cost rate is reduced by the average member contribution rate to produce the County's normal cost rate.

Budgeted Rate (Based on Corridor Method)

The employer's total contribution rate is equal to the normal cost rate plus rate changes due to amendments passed or assumption changes adopted since July 1, 2001 plus the expense rate, as long as the System's actuarial funded status remains within a corridor of 90% to 120%. The normal cost rate and actuarial accrued liability will continue to be measured using the entry age funding method. If the funded status falls outside the corridor, a credit (if above 120%) or charge (if below 90%) will be established based on a 15-year amortization equal to the amount necessary to re-enter the corridor.

Table IV-1	
Changes Since 2001	Impact on UAL Rate
2005 Assumption Changes	+ 1.23%
2006 DROP Implementation	+ 0.10%
2006 DPSC Conversion	- 0.04%
2007 Reduce Disability Offset to 40%	+ 0.03%
2008 Reduce Disability Offset to 30%	+ 0.02%
2010 Assumption Changes	+ 0.02%
2013 Reduce Disability Offset to 25%	+ 0.01%
2014 Assumption Changes	+ 1.15%
2014 Reduce Disability Offset to 15%	+ 0.02%
2016 Assumption Changes	<u>+ 0.88%</u>
Total Increase	+ 3.42%

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION IV – CONTRIBUTIONS

The table below presents and compares the budgeted rate for the System for this valuation and the prior one. In both cases, the amortization follows the corridor amortization to Total County Rate using 90%.

Table IV-2		
Actuarially Determined Rate (for Corridor Contribution)		
Valuation Date	June 30, 2017	June 30, 2018
Fiscal Year	2019	2020
Normal Cost Rate	8.54%	8.48%
UAL Rate	3.42%	3.42%
Amortization of Amount Outside Corridor (90%)	8.94%	9.51%
Expense Rate	0.25%	0.25%
Total County Rate	21.15%	21.66%
Total Rate with Alternative Amortization Targets of		
99%	27.14% ¹	27.68%
100%	27.80%	28.35% ²

¹ The actual contribution rate being paid by the County in FY 2019 is 27.22%, which is based on the amortize to 99% amount shown above with an additional amount to pay for the disability change.

² The actual contribution rate will include an additional amount of 0.08% to pay for the disability change.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION IV – CONTRIBUTIONS

Table IV-3 Development of Corridor Contribution Rate		
	June 30, 2017 (for FY 2019)	June 30, 2018 (for FY 2020)
1. Present Value of Future Benefits		
a. Active Employees	\$ 2,897,443,152	\$ 2,920,573,245
b. DROP	495,716,476	574,811,839
c. Retired Members	2,608,361,852	2,756,179,621
d. Vested Terminated and Inactive Members	<u>112,401,724</u>	<u>113,012,897</u>
e. Total Present Value	\$ 6,113,923,204	\$ 6,364,577,602
2. Present Value of Future Normal Costs		
a. County Portion	\$ 483,910,489	\$ 498,810,636
b. Employee Portion	<u>262,281,194</u>	<u>274,543,175</u>
c. Total Present Value	\$ 746,191,683	\$ 773,353,811
3. Actuarial Accrued Liability (1) – (2)	\$ 5,367,731,521	\$ 5,591,223,791
4. Actuarial Value of Assets for Corridor Purposes		
a. Actuarial Assets	\$ 3,930,924,191	\$ 4,070,486,587
b. Outstanding Balance of Plan and Assumption Changes	<u>178,546,464</u>	<u>166,612,314</u>
c. Adjusted Assets (a) + (b)	\$ 4,109,470,655	\$ 4,237,098,901
5. Funding Ratio for Corridor Test	76.6%	75.8%
6. Liability to be Amortized if outside Corridor		
a. [99% or 100%]x(3) - (4)(c)	\$ 1,204,583,551	\$ 1,354,124,890
b. (4)(c) - 120%x(3)	0	0
7. Active Member Payroll	\$ 728,022,176	\$ 754,080,802
8. Unfunded Liability Amortization Factor	11.0842	11.0842
9. Amortization as a % of Payroll (6)/(7)/(8)	14.93%	16.20%
10. County Contribution Results (Corridor)		
a. Normal Cost Rate	8.54%	8.48%
b. Administrative Expense Rate	0.25%	0.25%
c. Plan Change Amortizations	3.42%	3.42%
d. Amortization Outside Corridor (9)	<u>14.93%</u>	<u>16.20%</u>
e. Total County Contribution Rate June 30	27.14%	28.35%

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION V – ACCOUNTING STATEMENT INFORMATION

ASC Topic 960 of the Financial Accounting Standards Board (FASB) describes certain disclosures regarding a plan's funded status.

The FASB ASC Topic 960 disclosures provide a quasi "snap shot" view of how the System's assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if the System were to terminate.

FASB ASC Topic 960 specifies that a comparison of the present value of accrued (accumulated) benefits with the market value of the assets as of the valuation date must be provided. The relevant amounts as of June 30, 2017 and June 30, 2018 are exhibited in Table V-1, which also includes a reconciliation of liabilities determined as of the prior valuation, June 30, 2017 to the liabilities as of June 30, 2018.

Table V-2 is a history of gains and losses in Accrued Liability, and Table V-3 is the Solvency Test, which shows the portion of Accrued Liability covered by Assets. See our report dated October 15, 2018 for the required disclosures under GASB Statement No. 67.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION V – ACCOUNTING STATEMENT INFORMATION

Table V-1		
Accounting Statement Information		
	June 30, 2017	June 30, 2018
A. FASB ASC Topic 960 Basis		
1. Present Value of Benefits Accrued and Vested to Date		
a. Members Currently Receiving Payments	\$ 2,608,361,852	\$ 2,756,179,621
b. Vested Terminated and Inactive Members	112,401,724	113,012,897
c. DROP	495,716,476	574,811,839
d. Active Members	<u>848,517,525</u>	<u>835,167,886</u>
e. Total PVVB	\$ 4,064,997,577	\$ 4,279,172,243
2. Present Value of Non-Vested Accrued Benefits for Active Members	<u>588,104,797</u>	<u>587,935,769</u>
3. Total Present Value of Accrued Benefits	\$ 4,653,102,374	\$ 4,867,108,012
4. Assets at Market Value	<u>3,749,384,616</u>	<u>3,940,926,716</u>
5. Unfunded Present Value of Accrued Benefits, But Not Less Than Zero	\$ 903,717,758	\$ 926,181,296
6. Ratio of Assets to Value of Benefits (4) / (3)	80.6%	81.0%
B. Statement of Changes in Present Value of Accrued Benefits		
Actuarial Present Value of Accrued Benefits as of June 30, 2017		\$ 4,653,102,374
Increase (Decrease) During Years Attributable to:		
Passage of Time		\$ 326,498,817
Benefit Paid – FY 2018		(300,641,424)
Assumption Change		0
Plan Amendment		650,292
Benefits Accrued, Other Gains/Losses		<u>187,497,953</u>
Net Increase (Decrease)		\$ 214,005,638
Actuarial Present Value of Accrued Benefits as of June 30, 2018		\$ 4,867,108,012

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION V – ACCOUNTING STATEMENT INFORMATION

**Table V-2
Analysis of Financial Experience
Gains and Losses in Accrued Liability During Years Ended June 30
Resulting from Differences Between Assumed Experience and Actual Experience**

Type of Activity	<i>Gain (or Loss) for Year ending June 30,</i>					
	2013	2014	2015	2016	2017	2018
Investment Income	\$ 46,004,262	\$ 113,443,149	\$ (33,127,096)	\$ (120,548,533)	\$ (90,769,788)	\$ (64,779,936)
Combined Liability Experience	<u>(39,401,877)</u>	<u>3,445,687</u>	<u>73,129,057</u>	<u>34,314,735</u>	<u>(74,947,986)</u>	<u>(41,362,698)</u>
Gain (or Loss) During Year from Financial Experience	\$ 6,602,385	\$ 116,888,836	\$ 40,001,961	\$ (86,233,798)	\$ (165,717,774)	\$ (106,142,634)
Non-Recurring Items	<u>(727,193)</u>	<u>(1,462,698)</u>	<u>0</u>	<u>(69,346,439)</u>	<u>(582,418)</u>	<u>(603,265)</u>
Composite Gain (or Loss) During Year	\$ 5,875,192	\$ 115,426,138	\$ 40,001,961	\$ (155,580,237)	\$ (166,300,192)	\$ (106,745,899)

**Table V-3
Solvency Test
Aggregate Accrued Liabilities For**

Valuation Date June 30,	(1)	(2)	(3)	Reported Assets*	Portion of Accrued Liabilities by Reported Assets		
	Active Member Contributions	Retirees Vested Terms, Beneficiaries & DROP	Active Members (Employer Financed Portion)		(1)	(2)	(3)
2013	\$ 355,254,873	\$ 2,587,007,980	\$ 1,531,567,801	\$ 3,261,923,577	100%	100%	21%
2014	363,335,228	2,769,188,984	1,668,195,558	3,614,067,515	100%	100%	29%
2015	372,037,954	2,884,906,681	1,649,587,057	3,759,611,811	100%	100%	30%
2016	396,434,811	2,987,100,852	1,732,881,508	3,831,179,295	100%	100%	26%
2017	380,179,076	3,216,480,052	1,771,072,393	3,930,924,191	100%	100%	19%
2018	397,692,499	3,444,004,357	1,749,526,935	4,070,486,587	100%	100%	13%

*Reported assets are the actuarial value of assets in this demonstration.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

The data for this valuation was provided electronically by the Fairfax County Retirement System staff. Cheiron did not perform a formal audit on the data. However, we did perform checks of the data for reasonableness and consistency in accordance with Actuarial Standards of Practice No. 23 – Data Quality. The data was collected as of December 31, 2017.

Data reported in this Appendix is as of the December 31, 2017 data collection date. Covered payroll and benefits in pay status reported elsewhere in this report have been adjusted to approximate the June 30, 2018 values.

For inactive participants given with a Joint and Survivor form of benefit and no continuation percentage provided, a survivor percentage of 100% is assumed.

Summary of Membership Data as of December 31, 2017

		Active Members *		
		Count	Average Age	Average Salary
School	Plan A	1,748	53.27	\$ 34,776
	Plan B	1,908	53.89	40,427
	Plan C	1,369	46.06	23,257
	Plan D	<u>640</u>	<u>47.18</u>	<u>25,905</u>
	Total	5,665	51.05	\$ 32,893
County	Plan A	1,910	49.72	\$ 66,012
	Plan B	3,447	49.39	68,731
	Plan C	792	38.58	51,615
	Plan D	<u>2,090</u>	<u>39.92</u>	<u>60,896</u>
	Total	8,239	46.03	\$ 64,468
Total Systems	Plan A	3,658	51.42	\$ 51,086
	Plan B	5,355	50.99	58,646
	Plan C	2,161	43.32	33,650
	Plan D	<u>2,730</u>	<u>41.62</u>	<u>52,693</u>
	Total	13,904	48.07	\$ 51,603

*Excludes DROP participants.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

	Inactive Members		Total
	School	County	
Service Retirement			
Count	3,177	4,881	8,058
Annual Basic Benefit	\$ 55,517,556	\$ 158,913,442	\$ 214,430,998
Annual Supplements	8,899,490	26,690,584	35,590,073
Service – Connected Disability			
Count	71	68	139
Annual Basic Benefit ¹	\$ 1,542,197	\$ 2,079,995	\$ 3,622,192
Ordinary Disability			
Count	212	142	354
Annual Basic Benefit	\$ 2,093,934	\$ 2,196,773	\$ 4,290,706
Beneficiaries			
Count	34	404	438
Annual Basic Benefit	\$ 431,994	\$ 6,653,553	\$ 7,085,547
DROP			
Count	291	567	858
Annual Basic Benefit	\$ 6,931,232	\$ 22,164,899	\$ 29,096,131
Annual Supplements	3,227,361	10,226,665	13,454,026
Vested Former Members			
Count	1,060	1,209	2,269
Annual Basic Benefit ²	\$ 5,849,897	\$ 10,130,061	\$ 15,979,958

¹Benefits are net of offsets for Workers' Compensation and Social Security.

²Benefits are payable at age 65.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Membership Statistics						
The number of retired members, beneficiaries, and disabled members can be analyzed as follows:						
	<u>December 31, 2016</u>		<u>December 31, 2017</u>		<u>% Change</u>	
		Average Monthly Benefit		Average Monthly Benefit		Average Monthly Benefit
Inactive Members	Count		Count		Count	
Service Retirement						
Basic Benefit	7,691	\$ 2,220	8,058	\$ 2,245	4.8%	1.1%
Supplement	1,866	1,471	1,873	1,502	0.4%	2.1%
Service-Connected Disability	146	2,280	139	2,326	-4.8%	2.0%
Ordinary Disability	358	1,007	354	1,023	-1.1%	1.6%
Beneficiaries	<u>408</u>	<u>1,360</u>	<u>438</u>	<u>1,365</u>	<u>7.4%</u>	<u>0.4%</u>
Total/Average (Basic Benefit)	8,603	2,130	8,989	2,156	4.5%	1.2%

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Data Reconciliation from June 30, 2017 to June 30, 2018								
	Active	DROP	Terminated Vested	Retired	Service- Connected Disability	Ordinary Disability	Beneficiary	Total
Participant count as of July 1, 2017	13,986	745	2,207	7,691	146	358	408	25,541
New Hires / Re-hires	1,600		(27)					1,573
Terminated Vested	(310)		310					0
DROP	(357)	357						0
Retired	(237)	(248)	(74)	559				0
Deceased with beneficiary	(7)			(44)		(1)	52	0
Deceased without beneficiary	(13)		(4)	(143)	(9)	(17)	(18)	(204)
Benefits Expired				(6)				(6)
Ordinary Disability	(6)		(8)			14		0
Service-Connected Disability	(1)		(1)		2			0
Vested Return of Contributions			(163)					(163)
Terminated Not Vested	(751)							(751)
Corrections		<u>4</u>	<u>29</u>	<u>1</u>			<u>(4)</u>	<u>30</u>
Change	(82)	113	62	367	(7)	(4)	30	479
Participant count as of June 30, 2018	13,904	858	2,269	8,058	139	354	438	26,020

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - County Plan A

COUNTS BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	0	0	0	0	0	0	0	0	0
25 to 29	0	6	14	0	0	0	0	0	20
30 to 34	0	15	85	39	0	0	0	0	139
35 to 39	0	9	70	104	30	2	0	0	215
40 to 44	0	7	48	81	67	23	0	0	226
45 to 49	0	8	65	72	66	79	34	14	338
50 to 54	0	11	53	50	69	83	88	25	379
55 to 59	1	11	54	61	72	52	25	30	306
60 to 64	0	9	35	55	31	20	26	16	192
65 & up	0	12	23	16	15	10	8	11	95
Total	1	88	447	478	350	269	181	96	1,910

TOTAL SALARY BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	0	211,700	729,328	0	0	0	0	0	941,028
30 to 34	0	439,357	4,535,167	2,016,725	0	0	0	0	6,991,249
35 to 39	0	462,104	3,980,720	6,534,740	1,744,814	110,471	0	0	12,832,849
40 to 44	0	218,598	2,813,986	4,889,113	4,569,599	1,593,243	0	0	14,084,539
45 to 49	0	358,350	3,546,252	4,526,522	4,937,003	6,546,750	2,825,376	1,147,246	23,887,499
50 to 54	0	357,485	2,737,925	3,202,228	4,939,169	6,776,463	7,638,042	2,050,746	27,702,058
55 to 59	21,155	265,396	3,115,539	3,426,996	5,042,506	3,970,581	2,231,785	2,827,985	20,901,943
60 to 64	0	241,048	1,922,141	3,456,449	2,242,477	1,478,013	2,203,497	1,754,246	13,297,871
65 & up	0	204,714	1,066,440	719,825	849,300	653,492	561,565	1,388,283	5,443,619
Total	\$ 21,155	\$ 2,758,752	\$ 24,447,498	\$ 28,772,598	\$ 24,324,868	\$ 21,129,013	\$ 15,460,265	\$ 9,168,506	\$ 126,082,655



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - County Plan B

COUNTS BY AGE/SERVICE

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	1	55	2	0	0	0	0	0	58
30 to 34	0	20	195	65	1	0	0	0	0	281
35 to 39	0	10	172	170	47	0	0	0	0	399
40 to 44	0	13	146	168	88	15	0	0	0	430
45 to 49	0	12	144	178	122	51	29	3	0	539
50 to 54	0	21	138	172	137	74	45	13	0	600
55 to 59	0	20	150	184	139	63	17	13	0	586
60 to 64	0	20	121	144	95	18	4	9	0	411
65 & up	0	6	35	40	41	11	4	6	0	143
Total	0	123	1,156	1,123	670	232	99	44	0	3,447

TOTAL SALARY BY AGE/SERVICE

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	0	31,134	2,841,621	112,548	0	0	0	0	0	2,985,303
30 to 34	0	789,749	11,138,036	3,608,332	46,627	0	0	0	0	15,582,744
35 to 39	0	363,370	11,119,367	10,508,744	2,881,423	0	0	0	0	24,872,904
40 to 44	0	640,160	9,906,742	11,480,089	6,362,344	1,114,185	0	0	0	29,503,520
45 to 49	0	400,277	9,424,563	13,190,095	9,490,392	4,270,064	2,435,554	197,471	0	39,408,416
50 to 54	0	829,907	8,464,782	11,859,066	10,988,749	6,208,604	4,292,492	1,200,947	0	43,844,547
55 to 59	0	770,027	9,381,851	12,759,428	10,845,544	5,509,307	1,468,953	1,312,644	0	42,047,754
60 to 64	0	614,822	8,384,976	10,008,848	7,157,567	1,391,781	355,428	795,160	0	28,708,582
65 & up	0	236,905	2,286,025	2,965,236	2,862,128	816,561	265,396	530,175	0	9,962,426
Total	\$ 0	\$ 4,676,351	\$ 72,947,963	\$ 76,492,386	\$ 50,634,774	\$ 19,310,502	\$ 8,817,823	\$ 4,036,397	\$ 0	\$ 236,916,196

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - County Plan C

COUNTS BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	25	10	0	0	0	0	0	0	35
25 to 29	70	124	0	0	0	0	0	0	194
30 to 34	47	107	0	0	0	0	0	0	154
35 to 39	41	75	0	0	0	0	0	0	116
40 to 44	27	45	0	0	0	0	0	0	72
45 to 49	25	51	0	0	0	0	0	0	76
50 to 54	20	36	0	1	0	0	0	0	57
55 to 59	8	33	0	0	0	0	0	0	41
60 to 64	9	20	0	0	0	0	0	0	29
65 & up	6	12	0	0	0	0	0	0	18
Total	278	513	0	1	0	0	0	0	792

TOTAL SALARY BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 1,030,416	\$ 392,021	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 1,422,437
25 to 29	2,999,705	5,929,178	0	0	0	0	0	0	8,928,883
30 to 34	2,500,421	5,701,622	0	0	0	0	0	0	8,202,043
35 to 39	2,037,243	4,205,362	0	0	0	0	0	0	6,242,605
40 to 44	1,403,880	2,393,385	0	0	0	0	0	0	3,797,265
45 to 49	1,089,712	3,166,513	0	0	0	0	0	0	4,256,225
50 to 54	1,189,799	1,995,190	0	89,768	0	0	0	0	3,274,757
55 to 59	423,938	1,984,850	0	0	0	0	0	0	2,408,788
60 to 64	359,090	1,194,915	0	0	0	0	0	0	1,554,005
65 & up	173,988	617,836	0	0	0	0	0	0	791,824
Total	\$ 13,208,192	\$ 27,580,872	\$ 0	\$ 89,768	\$ 0	\$ 0	\$ 0	\$ 0	\$ 40,878,832

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - County Plan D

COUNTS BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	54	31	0	0	0	0	0	0	85
25 to 29	134	257	0	0	0	0	0	0	391
30 to 34	111	284	0	0	0	0	0	0	395
35 to 39	78	223	1	1	0	0	0	0	303
40 to 44	63	164	1	1	0	0	0	0	229
45 to 49	73	170	2	1	0	0	0	0	246
50 to 54	44	135	1	0	0	0	0	0	180
55 to 59	35	118	2	1	0	0	0	0	156
60 to 64	12	71	0	1	0	0	0	0	84
65 & up	3	17	1	0	0	0	0	0	21
Total	607	1,470	8	5	0	0	0	0	2,090

TOTAL SALARY BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 2,329,101	\$ 1,330,090	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 3,659,191
25 to 29	6,743,976	13,195,324	0	0	0	0	0	0	19,939,300
30 to 34	6,323,112	16,949,698	0	0	0	0	0	0	23,272,810
35 to 39	4,718,991	14,581,151	23,320	62,889	0	0	0	0	19,386,351
40 to 44	4,059,191	11,209,293	58,867	78,233	0	0	0	0	15,405,584
45 to 49	4,081,919	11,211,045	156,380	37,474	0	0	0	0	15,486,818
50 to 54	2,606,732	8,953,218	56,552	0	0	0	0	0	11,616,502
55 to 59	1,973,655	8,686,620	202,807	168,352	0	0	0	0	11,031,434
60 to 64	868,001	4,812,952	0	208,202	0	0	0	0	5,889,155
65 & up	181,069	1,323,122	81,130	0	0	0	0	0	1,585,321
Total	\$ 33,885,747	\$ 92,252,513	\$ 579,056	\$ 555,150	\$ 0	\$ 0	\$ 0	\$ 0	\$ 127,272,466

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - School Plan A

COUNTS BY AGE/SERVICE

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	1	6	3	2	0	0	0	0	0	12
30 to 34	1	9	13	7	0	0	0	0	0	30
35 to 39	2	39	35	20	4	0	0	0	0	100
40 to 44	2	70	59	49	13	3	0	0	0	196
45 to 49	3	74	95	67	28	10	1	2	2	280
50 to 54	2	84	118	71	37	17	7	5	5	341
55 to 59	1	64	130	101	48	9	4	10	10	367
60 to 64	1	49	113	68	23	5	5	2	2	266
65 & up	1	37	65	34	13	1	2	3	3	156
Total	14	432	631	419	166	45	19	22	22	1,748

TOTAL SALARY BY AGE/SERVICE

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	14,593	181,266	142,911	95,364	0	0	0	0	0	434,134
30 to 34	14,963	306,376	515,845	305,982	0	0	0	0	0	1,143,166
35 to 39	12,669	1,134,968	1,340,694	977,966	229,084	0	0	0	0	3,695,381
40 to 44	18,888	2,131,513	1,928,577	2,073,841	610,795	170,963	0	0	0	6,934,577
45 to 49	76,910	2,017,026	3,132,460	2,795,964	1,456,551	674,979	64,080	158,921	158,921	10,376,891
50 to 54	17,790	1,674,651	3,790,158	2,989,408	1,732,364	918,623	407,756	345,214	345,214	11,875,964
55 to 59	12,064	1,346,328	4,304,625	3,983,578	2,306,049	465,030	352,816	622,844	622,844	13,393,334
60 to 64	5,748	887,191	3,271,395	2,555,097	943,907	279,207	288,357	123,724	123,724	8,354,626
65 & up	12,300	722,993	1,741,430	1,217,882	565,984	43,575	105,499	170,423	170,423	4,580,086
Total	\$ 185,925	\$ 10,402,312	\$ 20,168,095	\$ 16,995,082	\$ 7,844,734	\$ 2,552,377	\$ 1,218,508	\$ 1,421,126	\$ 1,421,126	\$ 60,788,159



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - School Plan B

COUNTS BY AGE/SERVICE

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	1	0	0	0	0	0	0	1
25 to 29	0	4	4	1	0	0	0	0	0	9
30 to 34	0	5	24	14	0	0	0	0	0	43
35 to 39	0	14	26	27	13	0	0	0	0	80
40 to 44	0	24	56	46	22	9	3	0	0	160
45 to 49	0	50	82	79	64	17	17	3	3	312
50 to 54	0	66	122	85	65	36	22	2	2	398
55 to 59	0	70	117	100	85	39	10	3	3	424
60 to 64	0	43	98	100	49	16	3	3	3	312
65 & up	2	24	58	51	24	4	4	2	2	169
Total	2	300	588	503	322	121	59	13	13	1,908

TOTAL SALARY BY AGE/SERVICE

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 38,733	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 38,733
25 to 29	0	146,826	214,285	56,916	0	0	0	0	0	418,027
30 to 34	0	132,132	978,995	641,470	0	0	0	0	0	1,752,597
35 to 39	0	407,539	1,224,606	1,324,948	765,307	0	0	0	0	3,722,400
40 to 44	0	656,245	2,192,415	2,155,328	1,335,877	606,207	215,415	0	0	7,161,487
45 to 49	0	956,817	3,092,710	3,685,306	3,310,455	1,185,024	1,362,207	232,231	0	13,824,750
50 to 54	0	1,243,603	4,092,419	3,683,207	3,554,316	2,268,711	1,519,105	118,124	0	16,479,485
55 to 59	0	1,439,823	3,462,504	4,145,562	4,472,662	2,306,635	721,682	212,263	0	16,761,131
60 to 64	0	732,722	2,874,874	4,085,100	2,450,298	836,852	258,075	218,375	0	11,456,296
65 & up	58,741	501,534	1,565,089	1,801,750	1,045,413	209,931	215,002	121,824	0	5,519,284
Total	\$ 58,741	\$ 6,217,241	\$ 19,736,630	\$ 21,579,587	\$ 16,934,328	\$ 7,413,360	\$ 4,291,486	\$ 902,817	\$ 0	\$ 77,134,190



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - School Plan C

COUNTS BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	36	11	0	0	0	0	0	0	47
25 to 29	52	36	0	0	0	0	0	0	88
30 to 34	74	48	0	0	0	0	0	0	122
35 to 39	89	84	0	0	0	0	0	0	173
40 to 44	102	83	0	0	0	0	0	0	185
45 to 49	110	106	0	0	0	0	0	0	216
50 to 54	97	107	0	0	0	0	0	0	204
55 to 59	79	93	0	0	0	0	0	0	172
60 to 64	59	56	0	0	0	0	0	0	115
65 & up	22	25	0	0	0	0	0	0	47
Total	720	649	0	0	0	0	0	0	1,369

TOTAL SALARY BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 597,648	\$ 282,187	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 879,835
25 to 29	894,096	1,042,448	0	0	0	0	0	0	1,936,544
30 to 34	1,485,205	1,478,038	0	0	0	0	0	0	2,963,243
35 to 39	1,767,917	2,747,145	0	0	0	0	0	0	4,515,062
40 to 44	1,812,482	2,362,859	0	0	0	0	0	0	4,175,341
45 to 49	1,822,815	2,797,285	0	0	0	0	0	0	4,620,100
50 to 54	1,511,055	3,193,904	0	0	0	0	0	0	4,704,959
55 to 59	1,376,748	2,788,705	0	0	0	0	0	0	4,165,453
60 to 64	1,138,834	1,600,528	0	0	0	0	0	0	2,739,362
65 & up	391,030	748,066	0	0	0	0	0	0	1,139,096
Total	\$ 12,797,830	\$ 19,041,165	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 31,838,995

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - School Plan D

COUNTS BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	9	9	0	0	0	0	0	0	18
25 to 29	19	19	0	0	0	0	0	0	38
30 to 34	19	26	0	0	0	0	0	0	45
35 to 39	34	42	0	0	0	0	0	0	76
40 to 44	37	35	0	0	0	0	0	0	72
45 to 49	31	77	0	0	0	0	0	0	108
50 to 54	41	65	0	0	0	0	0	0	106
55 to 59	35	65	0	1	0	0	0	0	101
60 to 64	21	32	0	0	0	0	0	0	53
65 & up	8	15	0	0	0	0	0	0	23
Total	254	385	0	1	0	0	0	0	640

TOTAL SALARY BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 157,503	\$ 288,165	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 445,668
25 to 29	399,805	689,016	0	0	0	0	0	0	1,088,821
30 to 34	378,657	927,780	0	0	0	0	0	0	1,306,437
35 to 39	612,527	1,277,305	0	0	0	0	0	0	1,889,832
40 to 44	609,005	1,187,300	0	0	0	0	0	0	1,796,305
45 to 49	499,113	2,341,724	0	0	0	0	0	0	2,840,837
50 to 54	685,160	1,998,239	0	0	0	0	0	0	2,683,399
55 to 59	570,575	2,106,442	0	30,891	0	0	0	0	2,707,908
60 to 64	279,765	988,699	0	0	0	0	0	0	1,268,464
65 & up	156,257	395,435	0	0	0	0	0	0	551,692
Total	\$ 4,348,367	\$ 12,200,105	\$ 0	\$ 30,891	\$ 0	\$ 0	\$ 0	\$ 0	\$ 16,579,363

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Distribution of Active Participants - - Total

COUNTS BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	124	61	1	0	0	0	0	0	186
25 to 29	276	453	76	5	0	0	0	0	810
30 to 34	252	514	317	125	1	0	0	0	1,209
35 to 39	244	496	304	322	94	2	0	0	1,462
40 to 44	231	441	310	345	190	50	3	0	1,570
45 to 49	242	548	388	397	280	157	81	22	2,115
50 to 54	204	525	432	379	308	210	162	45	2,265
55 to 59	159	474	453	448	344	163	56	56	2,153
60 to 64	102	300	367	368	198	59	38	30	1,462
65 & up	42	148	182	141	93	26	18	22	672
Total	1,876	3,960	2,830	2,530	1,508	667	358	175	13,904

TOTAL SALARY BY AGE/SERVICE

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 4,114,668	\$ 2,292,463	\$ 38,733	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 6,445,864
25 to 29	11,052,175	21,426,892	3,928,145	264,828	0	0	0	0	36,672,040
30 to 34	10,702,358	26,724,752	17,168,043	6,572,509	46,627	0	0	0	61,214,289
35 to 39	9,149,347	25,178,944	17,688,707	19,409,287	5,620,628	110,471	0	0	77,157,384
40 to 44	7,903,446	20,799,353	16,900,587	20,676,604	12,878,615	3,484,598	215,415	0	82,858,618
45 to 49	7,570,469	23,249,037	19,352,365	24,235,361	19,194,401	12,676,817	6,687,217	1,735,869	114,701,536
50 to 54	6,010,536	20,246,197	19,141,836	21,823,677	21,214,598	16,172,401	13,857,395	3,715,031	122,181,671
55 to 59	4,378,135	19,388,191	20,467,326	24,514,807	22,666,761	12,251,553	4,775,236	4,975,736	113,417,745
60 to 64	2,651,438	11,072,877	16,453,386	20,313,696	12,794,249	3,985,853	3,105,357	2,891,505	73,268,361
65 & up	973,385	4,750,605	6,740,114	6,704,693	5,322,825	1,723,559	1,147,462	2,210,705	29,573,348
Total	\$ 64,505,957	\$ 175,129,311	\$ 137,879,242	\$ 144,515,462	\$ 99,738,704	\$ 50,405,252	\$ 29,788,082	\$ 15,528,846	\$ 717,490,856



**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Long-Term Assumptions Used to Determine System Costs and Liabilities

1. Demographic Assumptions

a. Healthy Mortality

Annual Deaths Per 10,000 Members Mortality Projected to 2018		
Age	Male	Female
20	4	2
25	5	2
30	5	2
35	6	3
40	7	4
45	11	7
50	46	27
55	63	37
60	86	54
65	124	84
70	190	133
75	307	217
80	518	367
85	902	651
90	1,597	1,171
95	2,522	1,936
100	3,580	2,872

110% and 100% of the RP-2014 Healthy Annuitant Mortality Table for males and females, respectively, backed down to 2006 then projected using the RPEC-2015 model, with an ultimate rate of 0.65% for ages 20-85 grading down to an ultimate rate of 0% for ages 115-120 and convergence to the ultimate rate in the year 2015. The valuation uses fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

5% of pre-retirement deaths are assumed to be service-connected.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

b. Disabled Mortality

Annual Deaths Per 10,000 Members Mortality Projected to 2018		
Age	Male	Female
45	173	105
50	208	135
55	235	169
60	267	204
65	324	249
70	415	335
75	565	490
80	806	740

100% and 115% of the RP-2014 Disabled Annuitant Mortality Table for males and females, respectively, backed down to 2006 then projected using the RPEC-2015 model, with an ultimate rate of 0.65% for ages 20-85 grading down to an ultimate rate of 0% for ages 115-120 and convergence to the ultimate rate in the year 2015. The valuation uses fully generational projection of mortality improvements. Sample rates shown are projected through the valuation date.

c. Termination of Employment (Prior to Normal Retirement Eligibility)

Annual Termination Rates Per 1,000 Members – County	
Service	Termination
0	176
5	72
10	39
15	19
20	10
25	4
30	0

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Annual Termination Rates Per 1,000 Members – Schools	
Service	Termination
0	250
5	45
10	28
15	18
20	12
25	10
30	0

It is assumed that members who terminate before the earlier of age 45 or with age plus service equal to 60 elect to receive a refund of contributions instead of vested benefits. Termination rates drop to zero three years prior to approaching Rule of 80 (or Rule of 85 for Plans C and D) retirement.

d. Disability

Annual Disabilities Per 10,000 Members*		
Age	Male	Female
25	2	1
30	2	1
35	2	1
40	3	2
45	7	6
50	14	11
55	21	17
60	27	21

* 30% of disabilities are assumed to be service-connected. Of these, 5% are assumed to receive Social Security benefits and 31% are assumed to receive Workers' Compensation benefits.

No disability is assumed to occur once members reach eligibility for retirement.

FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

e. Retirement/DROP

Annual Retirements/DROPs Per 1,000 Eligible Members (Male and Female)	
Age	Normal
50	190
51	200
52	200
53	230
54	240
55	275
56	250
57	300
58	250
59	250
60	250
61	275
62	300
63	250
64	350
65	400
66	250
67	250
68	200
69	250
70	250
71	250
72	250
73	250
74	250
75	1,000

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

f. Deferred Retirement Option Program (DROP)

Retirees are assumed to enter DROP instead of immediate retirement in accordance with the rates below. DROP participants are assumed to remain in DROP for three years and receive interest at 5% per annum on their DROP deferrals.

Annual DROP entrances per 100 Eligible Members (Male and Female)	
Age	DROP
50	70
55	68
60	63
65	30
70	30
75	30

g. Merit/Seniority Salary Increase (in addition to General Wage Increases)

County	
Service	Merit/Seniority Increases
0	4.00%
5	1.55
10	1.30
15	1.05
20	0.80
25	0.55
30	0.50

Schools	
Service	Merit/Seniority Increases
0	5.20%
5	2.10
10	1.50
15	1.10
20	0.80
25	0.60
30	0.60

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

h. Family Composition

For purposes of valuing the pre-retirement death benefit, an assumption is made that 80% of employees are married at death while active and that the female spouse is three years younger than the male spouse.

i. Sick Leave Credit

Unused sick leave balances as reported for each active member are used as of the valuation date. Future sick leave accruals are assumed to accrue at 100% of each participant's annual average but are capped at 124 hours per year for members hired on or after January 1, 2013.

2. Economic Assumptions

a. Rate of Investment Return:	7.25%
b. Rate of General Wage Increase:	2.75%*
c. Rate of Increase in Cost of Living:	2.50%**
d. Rate of Increase in Total Payroll (for Amortization):	2.75%
e. Administrative Expenses as a Percentage of Payroll:	0.25%

* General Wage Increase assumption applies for projecting contributions and developing Social Security benefits.

** Benefit increases are limited to 4% per year.

3. Rationale for Assumptions

The actuarial assumptions were adopted by the Board of Trustees upon the recommendation of the actuary, based on an experience study performed in 2016. The results of this study were presented in a report dated June 2016 and are incorporated into this report by reference.

4. Changes Since Last Valuation

None

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Funding Method

The Entry Age Normal Cost method is used to determine costs. Under this method, the employer contribution has three components: the normal cost, the payment toward the unfunded actuarial liability, and the expense rate.

The normal cost is a level percent of pay cost, which, along with the member contributions, will pay for projected benefits at retirement for each plan participant.

The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and funds accumulated as of the same date is referred to as the unfunded actuarial liability.

The expense rate is added to cover the System's administrative expenses.

Under the Corridor Funding Method, the employer's total contribution rate is equal to the normal cost rate plus the UAL amortization rates for changes due to assumption changes or amendments passed since July 1, 2001 plus the expense rate as long as the System's actuarial funded status remains within a corridor of 90% to 120%. If the funded status falls outside the corridor, a credit (if above 120%) or charge (if below 90%) will be established based on a 15-year amortization equal to the amount necessary to re-enter the corridor.

The 90% corridor floor has been increased to 100% with this valuation. Amortization layers will now be created annually and amortized over closed 15-year periods.

2. Actuarial Value of Assets

For purposes of determining the County contribution to the System, we use an actuarial value of assets. The asset adjustment method dampens the volatility in asset values that could occur because of fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process.

In determining the actuarial value of assets, we calculate an expected actuarial value based on cash flow for the year and imputed returns at the actuarial assumption. This expected value is compared to the market value, and one-third of the difference is added to the preliminary actuarial value to arrive at the final actuarial value.

3. Valuation Timing

All participant data is collected as of the December 31 prior to the valuation date. Initial valuation runs are performed as of December 31, and the resulting liabilities are then adjusted for six months to the June 30 valuation date. The adjustment takes into account

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

the actual July 1 cost-of-living increase and any other changes that are known to have occurred in that six-month period.

4. Changes Since Last Valuation and Rationale for Changes

The corridor floor has now reached 100% so annual 15-year closed amortization bases will be established. This change was enacted over a multi-year period to achieve a better funded system on a go-forward basis.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

1. Membership

The plan covers full-time and certain part-time County and School Board employees who are not covered by the Fairfax County Police Officers Retirement System, the Uniformed Retirement System, or the VRS. In order to join, the eligible employee must agree to make the required contributions.

Members hired prior to January 1, 2013 could elect to join Plan A or Plan B. Members hired on or after January 1, 2013 may elect to join Plan C or Plan D.

2. Member Contributions

Plans A and C: 4% of compensation up to Social Security wage base and 5-1/3% of compensation in excess of wage base

Plans B and D: 5-1/3% of compensation

Interest is credited at the rate of 5% per year.

Member contributions are made through an “employer pick-up” arrangement, which results in deferral of the taxes on these contributions.

3. Credited Service

All service as a member plus certain purchased prior service is credited. For members who have at least five years of service, credit is allowed at the rate of one month for 172 hours of accrued unused sick leave. For those hired on or after January 1, 2013, the amount of unused sick leave that may be used is capped at 2,080 hours.

4. Average Final Compensation

Base pay and roll call pay are credited, including the “pay” at the rate of final salary during the unused sick leave period. Average Final Compensation is the average over the high 36 consecutive months (or shorter period of total service).

5. Social Security Wage Base

The amount of wages subject to Social Security (FICA) taxes (\$128,400 in 2018).

6. Social Security Breakpoint

The Social Security breakpoint is the 35-year average of Social Security wage bases ending with the year the employee attains Social Security Retirement Age.

FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018

APPENDIX C – SUMMARY OF PLAN PROVISIONS

7. Normal Retirement

Eligibility

For those hired before January 1, 2013:

- (i) Age 65 with five years of service, or
- (ii) Age 50 with age plus service greater than or equal to 80

For those hired on or after January 1, 2013:

- (i) Age 65 with five years of service, or
- (ii) Age 55 with age plus service greater than or equal to 85

Benefit

Plan A and C Benefits: The sum of 1.8% of average final compensation up to the Social Security breakpoint plus 2% of average final compensation in excess of the breakpoint, all multiplied by credited service, and increased by 3%.

Plan B and D Benefits: 2% of average final compensation multiplied by credited service, increased by 3%.

All Plans: Pre-Social Security Retirement Age (SSRA) supplement of 1% of average final compensation up to the Social Security breakpoint times credited service, and increased by 3%. This benefit is payable from normal retirement age until the participant reached his/her SSRA (age 65, 66, or 67).

8. Early Retirement

Eligibility

- (i) Age 50 with 25 years of service, or
- (ii) 10 years of service with age plus service greater than or equal to 75

Benefit

Normal retirement benefit calculated using average final compensation and service at early retirement, actuarially reduced.

No pre-SSRA supplement benefit is payable.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

9. DROP (Deferred Retirement Option Program)

Eligibility

All members are eligible for DROP participation upon attaining eligibility for normal service retirement. Members can only participate in DROP once, and their election is irrevocable.

Benefit

The benefit scheduled to begin at normal retirement will be credited to a separate DROP account within the Retirement System, accumulating with interest while the member continues to work for a period of 36 months. Upon completion of the three-year period, DROP participation ends, and participants must terminate employment. At that time, the participant will receive payment of the accumulated DROP benefits and begin receiving his or her monthly retirement benefit (in the same amount as determined at commencement of DROP participation, plus annual cost-of-living increases).

For those hired on or after January 1, 2013, the amount credited to the DROP account will exclude the Pre-Social Security Supplement described in item 7.

The DROP account will be credited with interest at an annual rate of 5%, compounded monthly.

Death or Disability during DROP

Non Service-Connected: The effective date of the death or disability will be treated as the end of the DROP participation.

Service-Connected Disability: The member may elect either (1) to receive the service-connected disability benefits to which he or she would otherwise be entitled (forfeiture of DROP balance) or (2) the normal retirement benefit plus the DROP account balance.

Service-Connected Death: The beneficiary will receive payment of the accumulated DROP benefits and the regular service-connected benefit.

10. Service-Connected Disability

Eligibility

No age or service requirement

FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018

APPENDIX C – SUMMARY OF PLAN PROVISIONS

Benefit

66-2/3% of average final compensation less 100% of Virginia Workers' Compensation benefit.

11. Ordinary Disability

Eligibility

Five years of credited service

Benefit

2% of average final compensation times years of credited service, increased by 3%; maximum is 60% of average final compensation; minimum is \$300 per year, increased by 3%.

12. Service - Connected Death

Eligibility

No age or service requirement

Benefit

Lump sum payment of \$10,000 plus ordinary death benefit

13. Ordinary Death

Eligibility

Less than 15 years of service

Benefit

Return of employee contributions with interest, payable in lump sum

Eligibility

15 or more years of service

Benefit

Spouse Allowance: In lieu of the refund of contributions, the spouse of the deceased member may elect an allowance of 50% of the normal retirement benefit, based on average final

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

compensation and service as of the date of the member's death. The allowance is payable for the life of the spouse but ceases upon the spouse's remarriage, if such remarriage occurs prior to the spouse's attainment of age 60.

14. Vesting

Eligibility

Five years of service

Benefit

Normal retirement benefit based on average final compensation and service at date of termination. Benefit is payable in full at age 65 or actuarially reduced and payable at early retirement age.

A member may withdraw his contributions with interest at termination, in which case no vested benefit is payable.

15. Withdrawal

Eligibility

Not eligible for other benefits

Benefit

Contributions with interest

16. Form of Payment

The normal form of payment is a life annuity with a guarantee that at least the amount of member contributions with interest will be paid to the retiree or beneficiaries.

A member may elect an actuarially equivalent "pop-up" Joint and Survivor benefit with choice of 50%, 66 2/3%, 75%, or 100% continuation to the spouse.

17. Cost-of-Living Adjustment

Each July 1, benefits are increased by the lesser of 4% or the increase in the cost-of-living index. The increase is prorated for those who have not been retired for a full year.

Cost-of-living adjustments do not apply to the pre-SSRA supplement or to deferred vested benefits prior to benefit commencement.

**FAIRFAX COUNTY EMPLOYEES' RETIREMENT SYSTEM
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX C – SUMMARY OF PLAN PROVISIONS

In addition to automatic adjustments, benefits may be further increased on an ad hoc basis, if actuarial experience has been favorable.

18. Changes Since Last Valuation

The service-connected disability benefit offset was reduced from 5% to 0% of any primary Social Security benefit.



Classic Values, Innovative Advice