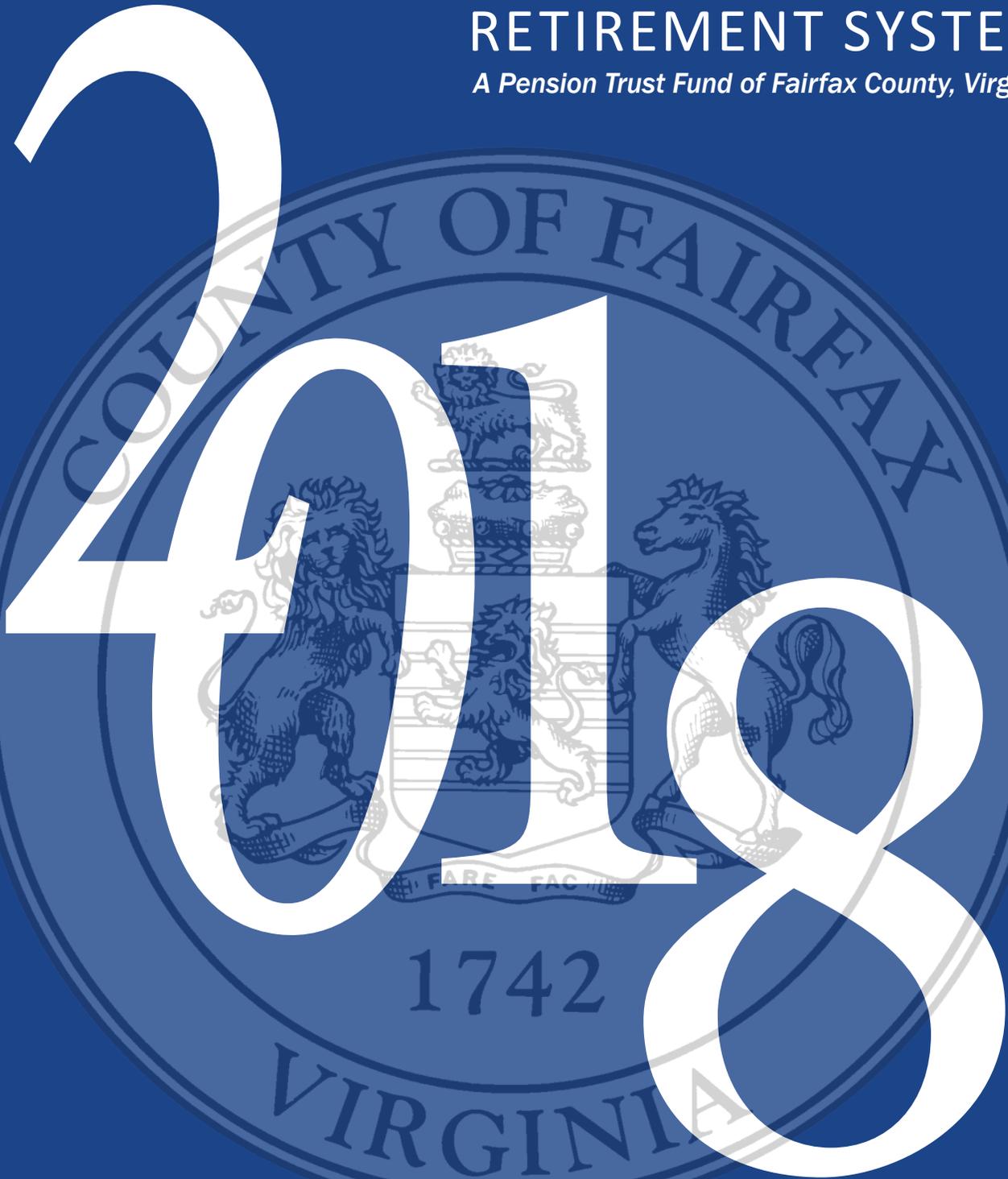


# **POLICE Officers** **RETIREMENT SYSTEM**

*A Pension Trust Fund of Fairfax County, Virginia*



## **COMPREHENSIVE ANNUAL FINANCIAL REPORT**

FOR THE FISCAL YEAR ENDED JUNE 30, 2018

# COMPREHENSIVE ANNUAL FINANCIAL REPORT

FOR THE FISCAL YEAR ENDED JUNE 30, 2018



Three systems...  
one team.

***A Pension Trust Fund of Fairfax County, Virginia***

This report was prepared by the financial, administrative and investment staff of the Fairfax County Police Officers Retirement System.

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# County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

November 5, 2018

Dear Members of the Board of Trustees:

I am pleased to submit to you the annual report of the Fairfax County Police Officers Retirement System (System) for the fiscal year ended June 30, 2018. This annual report is provided as an aid to understanding the structure and evaluating the status of the System. The System's management is responsible for the accuracy of financial information contained herein. The Management's Discussion and Analysis provides further detail to the financial statements.

## History

The Fairfax County Police Officers Retirement System was created under authority granted by Chapter 303 of the Acts of Assembly (law of the Commonwealth of Virginia) on March 29, 1944, to provide defined benefit pension plan coverage for sworn full-time law enforcement officers of the Fairfax County Police Department. In 1981 Fairfax County enacted Article 7 of the Fairfax County Code, which adopted and continued Chapter 303 as amended. There were 1,350 active members, 50 in the Deferred Retirement Option Program (DROP), 70 terminated vested members and 1,119 retirees participating in the System as of June 30, 2018. For calculations surrounding the Total Pension Liability and its components, Cheiron, the System's actuary, used June 30, 2018, as the measurement date which coincides with the actuarial valuation date.

## Provisions

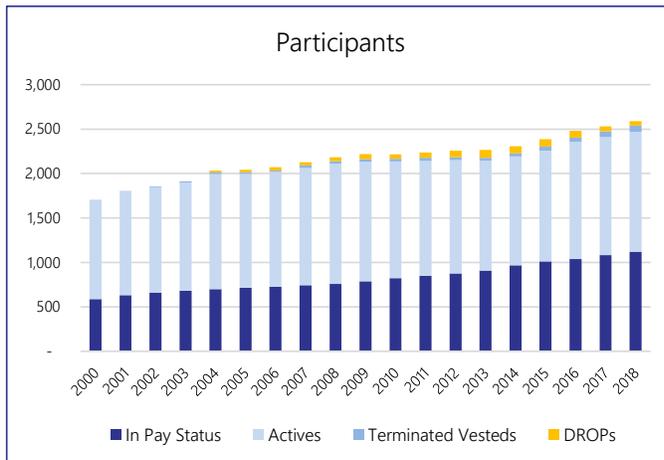
The benefit provisions of the System are established by County Ordinance. The System provides normal service retirement and early service retirement benefits for members who attain age or service requirements. Coverage for service-connected disability benefits is immediate upon membership in the System. Ordinary (non-service-related) disability benefits are provided after the attainment of five years of service. Members are vested after five years of service and are eligible for benefits at the early or normal service retirement date.

## Capital Markets and Economic Conditions

In fiscal year 2018, the System's investment returns reflected the continuing and long equity bull market. The System's portfolio investment return for the year was 7.91 percent (7.00 percent, net of fees), just under the long term return target of 7.25 percent. This return placed in the 69th percentile of the BNY Mellon Universe of public funds. Over the long term, returns compared less favorably, with investment returns for the ten-year period were 7.10 percent per year, ranking the fund in the 29th percentile of all other public funds in the BNY Mellon Universe. Additional details on the markets and the System's investments are provided in the Investment Section.



**Fairfax County Retirement Systems**  
 12015 Lee Jackson Memorial Hwy, Suite 350, Fairfax, VA 22033  
 Phone: 703-279-8200 \* 1-800-333-1633 \* Fax: 703-273-3185  
[www.fairfaxcounty.gov/retirement/](http://www.fairfaxcounty.gov/retirement/)



### Internal and Budgetary Controls

The System's management is responsible for the financial information presented in this report in accordance with U.S. Generally Accepted Accounting Principles. Proper internal accounting controls exist to provide reasonable, but not absolute, assurance for both the safekeeping of assets and the fair presentation of the financial statements. The concept of reasonable assurance recognizes that the cost of a control should not exceed the benefits likely to be derived and that the valuation of costs and benefits requires estimates and judgments by management.

### Investment Policies and Strategies

The Board of Trustees has adopted a Statement of Investment Objectives and Policy. This Statement establishes the investment goals, guidelines, constraints and performance standards that the Board of Trustees uses when exercising its fiduciary duties to manage the investment assets of the System. The Board operates in conformity with the standard of care required in making investments as stated in the Code of Virginia §51.1-803. Please see Note 3 to the Financial Section of this report for a description of this standard of care and details on the System's investment policies and strategies.

The Board receives quarterly reporting from staff to ensure compliance with its stated objectives and policy. Staff also monitors the performance of the System and its investment managers and updates the Board on a monthly basis throughout the year. Rate of return information is included in the Investment Section, prepared internally by staff using data from the System and investment managers.

Securities of the System, except for the pooled funds and the County's pooled cash and temporary investments, are held in safekeeping, on the System's behalf, by BNY Mellon Asset Servicing as agent. The BNY Mellon Financial Corporation, the parent company, carries Financial Institution bond insurance coverage including a Computer Crime Policy. An additional Excess Securities policy covers all risk of physical loss to securities.

### Funded Status

An actuarial valuation of the System to determine funding requirements is performed annually. The System's funding policy provides for periodic employer contributions at actuarially determined rates, which are calculated as a percentage of covered payroll, and are adjusted as necessary to accumulate sufficient assets to meet the costs of benefit payments when due. As of the latest annual valuation, performed as of June 30, 2018, the ratio of the market value of assets to total actuarial accrued liabilities for benefits increased from 83.3 percent to 83.8 percent. The actuarial section contains further information on the results of the June 30, 2018, valuation.

Based on the June 30, 2016, actuarial valuation, the employer contribution rate for 2018 following the adopted corridor-based funding policy remained unchanged from prior year at 38.98 percent. This was done to improve the funded level of the plan, accomplished by raising the target unfunded liability amortization level from 95 percent to 98 percent.

### **Major Initiatives**

Working in concert with the County's Chief Financial Officer, the System's actuary (Cheiron) and other County staff, efforts continue to improve the funded status of the Plan. As a result of this work, and as referenced above, the County has increased the employer contribution rate above what was required by the adopted corridor-based funding policy for three consecutive years.

In an effort to improve financial transparency, staff completed a major effort to account for all investment management and performance fees paid to investment management firms. While managers' investment performance has traditionally been evaluated net of these fees, the fees themselves were only previously reported for separately managed accounts.

This year, staff initiated a major retirement outreach effort, whereby members of the Retirement team go out to County agencies to meet with members. These small group sessions are in the form of interactive discussions, presentations and limited one-on-one counseling sessions. The goal of these various activities is to ensure that members know what their retirement benefits are, to let them know about the funding and overall health of their retirement system and to address any concerns that they might have.

### **Awards**

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to The Fairfax County Police Officers Retirement System for its comprehensive annual financial report for the fiscal year ended June 30, 2017. This was the eighth consecutive year that the System has achieved this prestigious award. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized comprehensive annual financial report. This report must satisfy both Generally Accepted Accounting Principles and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current annual financial report continues to meet the Certificate of Achievement Program's requirements and we are submitting it to the GFOA to determine its eligibility for another certificate.

Fairfax County Retirement Systems received the Public Pension Standards Award for the fiscal year ended June 30, 2018, from the Public Pension Coordinating Council (PPCC), in recognition of meeting the professional standards for plan funding as set forth in the Public Pensions Standards. The PPCC is a confederation of the National Association of the State Retirement Administrators (NASRA), the National Conference on Public Employee Retirement Systems (NCPERS) and the National Council on Teacher Retirement (NCTR).

### **Other Information**

#### *Independent Audit and Actuarial Certifications*

Cherry Bekaert LLP performed an annual audit of the financial statements of the System to obtain reasonable assurance about whether the financial statements are free from material misstatements, whether due to fraud or error. Additionally, Cheiron performed an annual actuarial valuation to assess the plan's ability to meet future obligations. The report of independent auditor and certification from the actuary are included in this report.

## Introductory Section

### *Acknowledgements*

This report is intended to provide complete and reliable information for determining the financial status of the System. It is being submitted to the Board of Supervisors and other interested parties and is available to the public via the County's website located at [www.fairfaxcounty.gov/retirement/](http://www.fairfaxcounty.gov/retirement/).

This annual report for the Police Officers Retirement System is the result of the hard work of the System's Accounting team, as assisted by other members of the Retirement Systems Team.

I am very thankful and feel privileged to lead the Retirement Systems team. These fine people work every day to provide the best-possible service and stewardship for the employees, retirees and citizens of Fairfax County. Finally, I must express my deep appreciation, on behalf of the 2,589 members and beneficiaries of the Police Officers Retirement System, for your dedicated service as trustees.

Respectfully submitted,



Jeffrey K. Weiler  
Executive Director



Government Finance Officers Association

**Certificate of  
Achievement  
for Excellence  
in Financial  
Reporting**

Presented to

**Fairfax County  
Uniformed Retirement System  
Virginia**

For its Comprehensive Annual  
Financial Report  
for the Fiscal Year Ended

**June 30, 2017**

*Christopher P. Morill*

Executive Director/CEO



Public Pension Coordinating Council

***Recognition Award for Funding  
2018***

Presented to

**Fairfax County Police Officers Retirement System**

In recognition of meeting professional standards for  
plan funding as  
set forth in the Public Pension Standards.

*Presented by the Public Pension Coordinating Council, a confederation of*

National Association of State Retirement Administrators (NASRA)  
National Conference on Public Employee Retirement Systems (NCPERS)  
National Council on Teacher Retirement (NCTR)

A handwritten signature in black ink that reads "Alan H. Winkle". The signature is written in a cursive style.

Alan H. Winkle  
Program Administrator

## Board of Trustees

Seven members serve on the Fairfax County Police Officers Retirement System Board of Trustees. Three of the members are citizens appointed by the Fairfax County Board of Supervisors. Two of the members are elected by Fairfax County Government Employees, and one member is elected by retirees. The Director of Finance serves as an Ex Officio member.



**Rich Barron** - *President*  
Elected Member Trustee  
Term Expires: December 31, 2019



**Edward C. O'Carroll** - *V.P. & Secretary*  
Elected Member Trustee  
Term Expires: December 31, 2020



**Christopher J. Pietsch** - *Treasurer*  
Ex officio Trustee  
Fairfax County Director of Finance



**James E. Bitner**  
Board of Supervisors Appointee  
Term Expires: June 30, 2022



**James R. Dooley, Jr.**  
Elected Retired Member Trustee  
Term Expires: June 30, 2022



**Brendan D. Harold**  
Board of Supervisors Appointee  
Term Expires: December 31, 2018



**Jay A. Jupiter**  
Board of Supervisors Appointee  
Term Expires: December 31, 2021

**Administrative Organization**

**Administrative Staff**

Jeffrey K. Weiler  
*Executive Director*

Katherine Molnar, CFA  
*Chief Investment Officer*

**Investment Managers**

Acadian Asset Management, LLC  
Boston, MA

AlphaSimplex  
Cambridge, MA

AQR Capital Management, LLC  
Greenwich, CT

BlackRock, Inc  
San Francisco, CA

Bridgewater Associates, LP  
Westport, CT

Cohen & Steers Capital Management, Inc  
New York, NY

Crestline Management  
Fort Worth, TX

Czech Asset Management  
Old Greenwich, CT

DWS  
Chicago, IL

DGV Solutions, LP  
Minnetonka, MN

DoubleLine Capital, LP  
Los Angeles, CA

First Eagle Investment Management  
New York, NY

King Street Capital Management, LP  
New York, NY

Landmark Partners  
Boston, MA

**Investment Managers**

Loomis, Sayles & Company, LP  
Boston, MA

Marathon Asset Management  
New York, NY

Neuberger Berman Group, LLC  
New York, NY

Parametric Portfolio Associates  
Edina, MN

PIMCO  
Newport Beach, CA

Sands Capital Management, Inc  
Arlington, VA

Solus Alternative Asset Management  
New York, NY

Standish Mellon Asset Management Co  
Pittsburgh, PA

Starboard Value, LP  
New York, NY

WCM Investment Management  
Laguna Beach, CA

**Professional Services**

Actuary

Cheiron  
Actuaries  
McLean, VA

Auditor

Cherry Bekaert LLP  
Certified Public Accountants  
Tysons Corner, VA

Custodian Bank

BNY Mellon Asset Servicing  
Pittsburgh, PA

Legal Counsel

Morgan, Lewis & Bockius LLP  
Washington, DC

Schedule of fees and schedule of commissions are located in the Investment Section, pages 53-54.

Organization Chart



**Board of Supervisors**

*Daniel G. Storck, John C. Cook, Catherine M. Hudgins, Jeffrey C. McKay, Sharon Bulova (Chairman At-Large), County Executive Bryan Hill, Penelope A. Gross (Vice Chairman), John W. Foust, Kathy L. Smith, Linda Q. Smyth, Pat Herryty*

**Board of Trustees**

*(Seven Members – see page 7)  
Richard A. Barron, James E. Bitner, James R. Dooley, Jr. Brendan D. Harold, Jay A. Jupiter, Edward C. O'Carroll, Christopher J. Pietsch*



**Executive Director**  
*Jeff Weiler*



**Chief Investment Officer**  
*Katherine Molnar, CFA*



**Investment Operations Manager**  
*Jennifer Snyder*



**Investment Analyst**  
*Damien Lee, CFA*



**Retirement Systems Management Team**  
*Back left to right: Wendy Zhi, CPA, Retiree Services; Vicky Panlaqui, Accounting and Financial Reporting; Pamela Taylor, Technology  
Front: John Prather, Membership Services; Carol Patterson, Communications*



## Report of Independent Auditor

To Board of Supervisors  
County of Fairfax, Virginia

To the Board of Trustees  
Fairfax County Police Officers Retirement System

### **Report on the Financial Statements**

We have audited the accompanying basic financial statements of the Fairfax County Police Officers Retirement System (the "System"), a pension trust fund of the County of Fairfax, Virginia, a pension trust fund of the County of Fairfax, Virginia, as of and for the year ended June 30, 2018, and the related notes to the financial statements, as listed in the table of contents.

### ***Management's Responsibility for the Financial Statements***

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### ***Auditor's Responsibility***

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

***Opinion***

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the System as of June 30, 2018, and the changes in fiduciary net position thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

***Other Matters***

*Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, schedule of changes in net pension liability and related ratios, schedule of net pension liability, schedule of money-weighted rate of return, schedule of employer contributions and summary of significant changes to the pension system be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

*Other Information*

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the System's basic financial statements. The introduction section, schedule of administrative expenses, schedule of investment expenses, schedule of consultant expenses, investment section, actuarial section, and statistical section are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The schedule of administrative expenses, schedule of investment expenses, and schedule of consultant expenses are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedule of administrative expenses, schedule of investment expenses, and schedule of consultant expenses are fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The introduction section, investment section, actuarial section, and statistical section have not been subjected to the auditing procedures applied in the audit of the basic financial statements and, accordingly, we do not express an opinion or provide any assurance on them.

***Other Reporting Required by Government Auditing Standards***

In accordance with *Government Auditing Standards*, we have also issued our report dated November 5, 2018, on our consideration of the System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the System's internal control over financial reporting and compliance.

A handwritten signature in cursive script that reads "Cheryl Baekaert CPA".

Tysons Corner, Virginia  
November 5, 2018

Management’s Discussion and Analysis  
(Unaudited)

This section presents management’s discussion and analysis of the Fairfax County Police Officers Retirement System’s (“System” or “Plan”) financial performance and provides an overview of the financial activities for the fiscal year ended June 30, 2018. The information in this section should be reviewed in conjunction with the Letter of Transmittal located in the Introductory Section.

**Overview of Financial Statements and Accompanying Information**

The financial presentation is composed of four parts: (1) the financial statements; (2) notes to the financial statements; (3) required supplementary information and (4) other supplementary information. Below is the summary of the information provided in each of these sections.

**Financial Statements**

The System presents the Statement of Fiduciary Net Position as of June 30, 2018 and Statement of Changes in Fiduciary Net Position for the fiscal year ended June 30, 2018. The Statement of Fiduciary Net Position provides a snapshot of the financial position. It reports the assets, liabilities and resulting net position restricted for pension benefits. The Statement of Changes in Fiduciary Net Position presents the Plan’s transactions under the categories of Additions and Deductions. Additions include contributions from the County and by participating employees, net appreciation in the fair value of investments, dividend and interest income. Investment income is reduced by investment-related expenses such as asset management fees, custody charges and consulting fees. Deductions include outlays for monthly pension benefits, death benefits, refunds of contributions to employees and fees paid for professional services and administrative expenses.

**Notes to Financial Statements**

The Notes to Financial Statements are an integral part of the financial statements and include additional information and schedules to provide a better understanding of the fiduciary fund financial statements. The Notes to Financial Statements include detailed information that is not readily evident in the financial statements such as the accounting policies, plan membership and benefits, and summary disclosures. Specifically:

- Note 1 Describes significant accounting policies.
- Note 2 Provides a description of the System, the funding policy, and member contributions and benefits.
- Note 3 Describes investments and disclosures on fair value hierarchy, interest rate, credit quality, foreign currency risk, derivatives disclosures, and security lending.
- Note 4 Describes the net pension liability, actuarial method and assumptions.
- Note 5 Explains the System’s tax status.

**Required Supplementary Information**

This section consists of historical trend exhibits such as the Schedule of Changes in Net Pension Liability and Related Ratios, Schedule of Net Pension Liability, Schedule of Employer Contributions accompanied by the Notes to Schedule of Employer Contributions and Schedule of Money-Weighted Rate of Return. These schedules will be presented over 10 years as information becomes available. A Summary of Significant Changes to the Pension System is also included.

**Other Supplementary Information**

This section includes the Schedule of Administrative Expenses and the Schedule of Investment and Consultant Expenses. The Required Supplementary Information and Other Supplementary notes are immediately following the Notes to the Financial Statements.

Management’s Discussion and Analysis  
(continued)

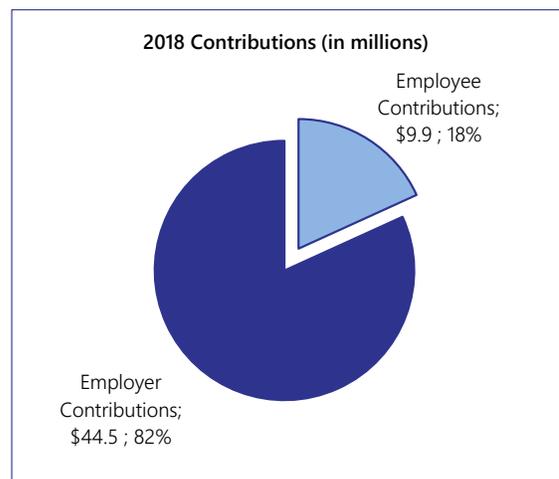
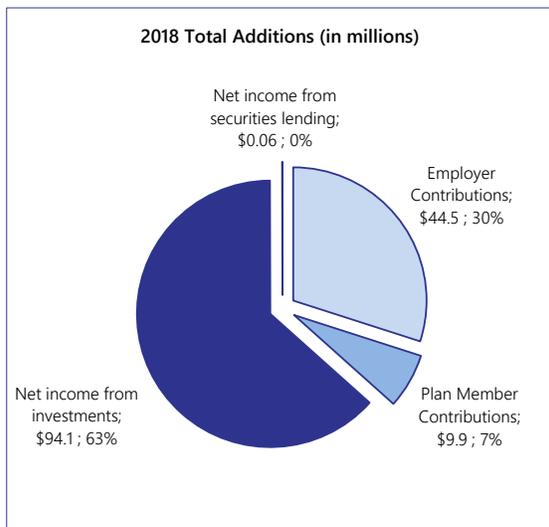
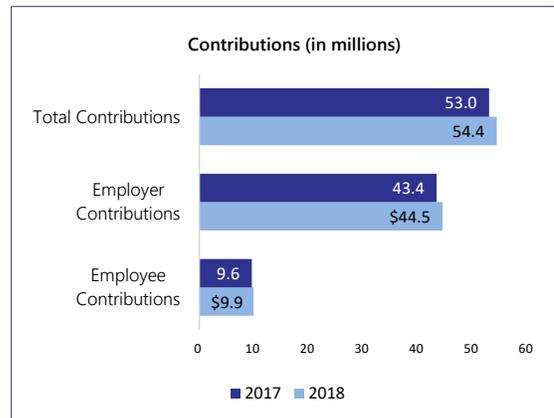
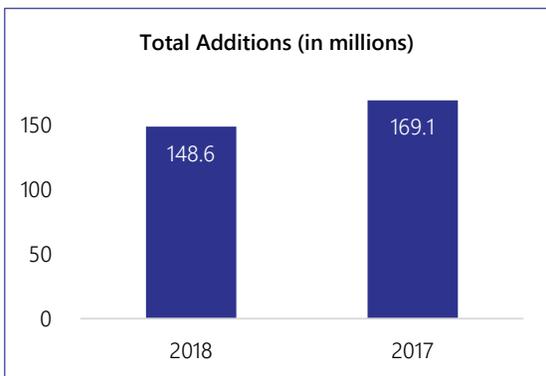
Financial Highlights

The net position restricted for pension benefits as of June 30, 2018, and June 30, 2017, was \$1,435.9 million and \$1,365.8 million, respectively. The net position representing assets available to pay for current and future member pension benefits, increased by \$70.1 million or 5.1 percent.

Total additions to net position decreased by 12.2 percent from \$169.1 million in 2017 to \$148.6 million in 2018.

Net investment income decreased 18.9 percent from \$116.1 million in 2017 to \$94.1 million in 2018. The net money-weighted rate of return on investments on a fair value basis was 7.0 percent in fiscal year 2018, and has decreased from 9.3 percent in fiscal year 2017.

Employer and employee contributions received totaled \$54.4 million, an increase of 2.6 percent or \$1.4 million compared to 2017 received contributions of \$53.0 million. The employer contributions increased by 2.6 percent from \$43.4 million in fiscal year 2017 to \$44.5 million in fiscal year 2018.



Management’s Discussion and Analysis  
(continued)

Total deductions from fiduciary net position increased by \$4.8 million from \$73.7 million in 2017 to \$78.5 million in 2018. Member retirement benefit payments of \$77.5 million in 2018 make up the majority of total deduction and increased by \$5.0 million or 6.8 percent from \$72.5 million in 2017. The number of retired members and beneficiaries receiving a benefit payment increased 3.4 percent from 1,082 to 1,119 payees as of June 30, 2018.

	2018	2017
Net Pension Liability (in millions)	\$277.4	\$274.8
Net Position as Percentage of TPL	83.8%	83.2%
Covered Payroll (in millions)	\$114.2	\$111.3
Net Pension Liability as Percentage of Covered Payroll	242.9%	246.9%

Financial Analysis

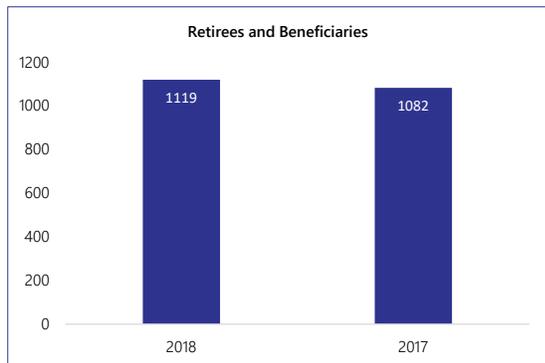
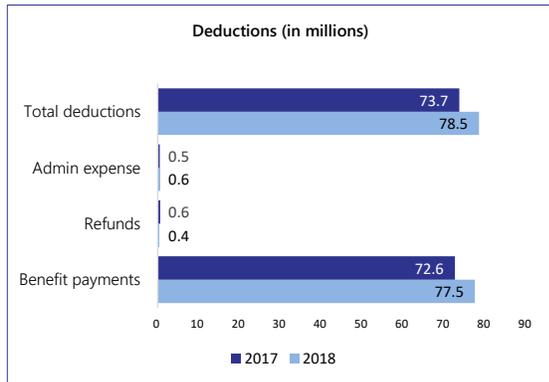
Plan Net Position

When viewed over time, increases or decreases in plan net position can be used to measure the financial condition of a pension plan.

For fiscal year 2018, the net position of the Police Officers Retirement System increased 5.1 percent, resulting in a total net position value of \$1,435.9 million, reflecting an increase of \$70.1 million over fiscal year 2017.

Total assets as of June 30, 2018, was \$1,455.2 million, representing an increase of \$66.5 million, or 4.8 percent over the previous fiscal year. The main component of the increase was due to favorable market conditions that resulted in a total cash and investment of \$1,433.0 million in fiscal year 2018 as compared to \$1,364.8 million in fiscal year 2017.

Receivables increased by \$4.2 million or nearly 51 percent due to the timing of investment for settled trades that occurred near year end.



The net pension liability as calculated per GASB 67 as of June 30, 2018, and June 30, 2017, was \$277.4 million and \$274.8 million, respectively. The net position as a percentage of total pension liability as of June 30, 2018, and June 30, 2017, was 83.8 percent and 83.2 percent, respectively. The net pension liability as a percentage of covered payroll has decreased from 246.9 percent in fiscal year 2017 to 242.9 percent in fiscal year 2018. The covered payroll increased from \$111.3 million in fiscal year 2017 to \$114.2 million in fiscal year 2018.

## Management's Discussion and Analysis

(continued)

The table below details the Police Retirement System's net position for the current and prior year.

Summary of Plan Fiduciary Net Position				
Assets	2018	2017	Difference	Percentage of Change
Total cash and investments	\$1,433,021,582	\$1,364,821,763	\$68,199,819	5.0%
Cash collateral, securities lending	9,607,296	15,575,860	(5,968,564)	-38.3%
Capital assets, net	11,439	-	11,439	100.0%
Total receivables	<u>12,605,871</u>	<u>8,364,534</u>	<u>4,241,337</u>	50.7%
<b>Total assets</b>	1,455,246,188	1,388,762,157	66,484,031	4.8%
Liabilities				
Purchase of investments	(\$5,886,321)	(\$4,113,434)	(\$1,772,887)	43.1%
Cash collateral, securities lending	(9,607,296)	(15,575,860)	5,968,564	-38.3%
Accounts payables and others	<u>(3,829,548)</u>	<u>(3,228,603)</u>	<u>(600,945)</u>	18.6%
<b>Total liabilities</b>	<u>(19,323,165)</u>	<u>(22,917,897)</u>	<u>3,594,732</u>	-15.7%
<b>Net position restricted for pension benefits</b>	<b><u>\$1,435,923,023</u></b>	<b><u>\$1,365,844,260</u></b>	<b><u>\$70,078,763</u></b>	<b>5.1%</b>

Net Position for Current and Prior Fiscal Year			
Fiscal Year	Ending Balances (millions)	Net change in dollars (millions)	Net Change in Percent
2018	\$1,435.9	\$70.1	5.1%
2017	\$1,365.8	\$95.4	7.5%

Total liabilities as of June 30, 2018, were \$19.3 million, representing a decrease of \$3.6 million, or 15.7 percent, over the previous year. The downturn in total liabilities is the result of a decreased level of securities lending activity. However, there was a 35 percent increase in the accrued liabilities, including the year-end accrual for management fees.

The Plan's investments are exposed to various risks including interest rate, market and credit risks. These risks may be influenced by changes in economic conditions and market conditions. Therefore, it is reasonable to assume that there will be changes in the values of the investments held in trust, which could materially affect the amounts reported in the financial statements. Detailed information on investment results are in the Investment Section of this report.

	2018	2017	Difference	Percentage of Change
Accrued Liabilities	\$2,490,147	\$1,844,300	\$645,847	35.02%

Securities lending cash collateral decreased by \$6.0 million or 38.3 percent due to a decrease in activities in the securities lending program.

The total assets of \$1,445.2 million exceeded its liabilities of \$19.3 million at the close of the Plan year ended June 30, 2018 with \$1,435.9 million in net position restricted for pension benefits.

Management’s Discussion and Analysis  
(continued)

Summary of Additions and Deductions

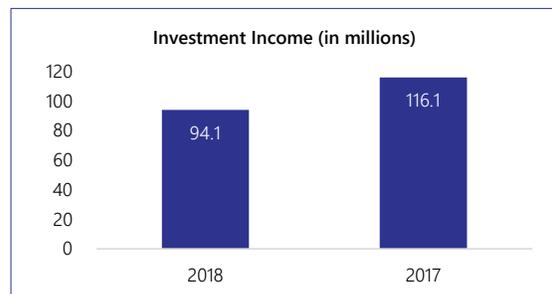
Additions	2018	2017	Difference	Percentage of
				Change
Employer Contributions	\$44,504,675	\$43,381,151	\$1,123,524	2.6%
Plan Member Contribution	9,895,922	9,631,618	264,304	2.7%
Net income from investments	94,095,592	116,051,427	(21,955,835)	-18.9%
Net income from securities lending	<u>55,331</u>	<u>47,923</u>	<u>7,408</u>	<u>15.5%</u>
<b>Total Additions</b>	<b>148,551,520</b>	<b>169,112,119</b>	<b>(20,560,599)</b>	<b>-12.2%</b>
<b>Deductions</b>				
Benefit payments	77,478,191	72,534,389	4,943,802	6.8%
Refunds	360,176	641,609	(281,433)	-43.9%
Administrative expense	<u>634,391</u>	<u>481,574</u>	<u>152,817</u>	<u>31.7%</u>
<b>Total deductions</b>	<b><u>78,472,758</u></b>	<b><u>73,657,572</u></b>	<b><u>4,815,186</u></b>	<b><u>6.5%</u></b>
<b>Net increase/(decrease)</b>	<b><u>\$70,078,762</u></b>	<b><u>\$95,454,547</u></b>	<b><u>(\$25,375,785)</u></b>	<b><u>-26.6%</u></b>

Additions and Deductions

Total additions to the retirement fund consist of contributions from employers and active members and changes in the value of assets. Total additions decreased by \$20.6 million or 12.2 percent in fiscal year 2018 attributed primarily due to \$22.0 million, or 18.9 percent, depreciation in the fair value of the investments. This decline compared to the previous year’s investment performance was due to the less favorable market environment in fiscal year 2018.

Total contributions for the fiscal year ended June 30, 2018, amounted to \$54.4 million. This was an increase of \$1.4 million when compared with the activity of fiscal year 2017. The employer contributions for fiscal year 2018 increased by 2.6 percent only as employer contribution rate remained at 38.98 percent of salary. Employee contributions increased by 2.7 percent due to merit and 1.3 percent COLA increase.

The System experienced a 15.5 percent increase in net income from securities lending as a result of an upturn in lending securities activities during the fiscal year. Investment returns were lower for fiscal year 2018 than 2017 reflecting less favorable returns in the capital markets. Net investment income decreased from \$116.1 million in fiscal year 2017 to \$94.1 million in fiscal year 2018, which is consistent with the decrease in the net money-weighted investment rate of return from 9.3 percent for fiscal year 2017 to 7.0 percent for fiscal year 2018.



Total deductions of the System consist of the payments of benefits to retirees and beneficiaries, the refund of contributions to former members and the cost of administering the System. The total deductions for fiscal year 2018 was \$78.5 million, an increase of \$4.8 million, or 6.5 percent, over fiscal year 2017. Regular pension benefit payments increased as the number of retirees and beneficiaries receiving benefit payments rose to 1,119 from 1,082 in fiscal year 2017. Benefit payments also increased due to a cost-of-living increase of 1.3 percent and higher average benefits for new retirees. Refunds reflected a 43.9 percent decrease due to lower employee turnover, separation of employees in the fiscal year, lesser employees asking for refunds or lower balances of refunded amount.

## Management's Discussion and Analysis

Participant Counts	2018	2017
Actives	1,350	1,329
DROP members	50	57
Terminated vested	70	63
Retiree in payment status	<u>1,119</u>	<u>1,082</u>
Total	<b><u>2,589</u></b>	<b><u>2,531</u></b>

An actuarial valuation is performed annually by Cheiron. The actuarial value of the assets as of the last valuation on June 30, 2018, was \$1,458.9 million, while actuarial liabilities as of the same period was \$1,713.3 million. As of June 30, 2018, the date of the most recent actuarial valuation, the funded ratio of the system was 85.2 percent. This was an increase of 0.2 percent from the July 1, 2017, valuation funded ratio of 85.0 percent. The combination of liabilities, investment results and member and employer contributions over the last year led the funding ratio to an increase. Under GASB 67 calculation, using the December 31, 2017, data rolled forward to June 30, 2018, the plan fiduciary net position as a percentage of the total pension liability was 83.8 percent. It increased from 83.2 percent in fiscal year 2017, primarily as a result of the growth in the plan fiduciary net position due to investment returns. In addition, the Total Pension Liability as of June 30, 2018, and June 30, 2017, was \$1,713.3 million and \$1,640.7 million, respectively.

(Dollars in millions)	2018	2017
Actuarial Accrued Liability	\$1,713.3	\$1,640.7
Actuarial Value of Assets	<u>1,458.9</u>	<u>1,394.3</u>
Unfunded Actuarial Liability	254.4	246.4
Funded Ratio	85.2%	85.0%
Total Pension Liability	\$1,713.3	\$1,640.7
Plan Fiduciary Net Position	<u>1,435.9</u>	<u>1,365.8</u>
Net Pension Liability	277.4	274.8
Funding Ratio	83.8%	83.2%

### Investment Management Fees

Investment management fees were higher than the prior year due to a reclassification of management fees associated with commingled funds. In an effort to provide a greater level of transparency, investment managers for commingled funds were requested to provide the management fees, rather than netting the management fees against investment activities. The fees have not suddenly and significantly increased. This reclassification did not affect the net investment performance.

### Contacting the System's Financial Management

This financial report is designed to provide our membership, the Board of Trustees and the County's Board of Supervisors with a general overview of the System's financial condition. If you have any questions about this report or need additional information, contact the Fairfax County Retirement System, 12015 Lee Jackson Memorial Highway, Fairfax, VA 22033. This report can also be found on the County's internet site at [www.fairfaxcounty.gov/retirement/](http://www.fairfaxcounty.gov/retirement/).

## Basic Financial Statements

## Statement of Fiduciary Net Position

as of June 30, 2018

**Assets**

Cash and short-term investments		
Equity in County's pooled cash and temporary investments	\$2,021,327	
Cash collateral received for securities on loan	9,607,296	
Short-term investments	<u>94,308,269</u>	
Total cash and short-term investments		\$105,936,892
Capital Assets		
Building Improvements, net	4,670	
Equipment, net	<u>6,769</u>	
Total capital assets		11,439
Receivables		
Accounts receivable	3,176,665	
Accrued interest and dividends	2,279,382	
Investment proceeds and other receivables	<u>7,149,824</u>	
Total receivables		12,605,871
Investments, at fair value		
Common and preferred stock	135,060,345	
Fixed income		
Asset-backed securities	55,865,898	
Corporate and other bonds	62,280,528	
U.S. Government obligations	49,053,811	
Pooled and mutual funds	<u>1,034,431,404</u>	
Total investments		<u>1,336,691,986</u>
Total assets		1,455,246,188
<b>Current Liabilities</b>		
Investment purchases and other liabilities	5,886,321	
Cash collateral received for securities on loan	9,607,296	
Accounts payable and accrued expenses	3,773,714	
Compensated absences, short-term	25,036	
<b>Noncurrent Liabilities</b>		
Compensted absences, long-term	<u>30,798</u>	
Total liabilities		<u>(19,323,165)</u>
<b>Net position restricted for pension benefits</b>		<b><u>\$1,435,923,023</u></b>

See accompanying notes to financial statements.

## Basic Financial Statements

## Statement of Changes in Fiduciary Net Position

For the Year Ended June 30, 2018

**Additions**

Contributions		
Employer	\$44,504,675	
Plan members	<u>9,895,922</u>	
Total contributions		\$54,400,597
Investment income from investment activities		
Net appreciation in fair value of investments	94,597,481	
Interest	12,272,637	
Dividends	<u>3,803,393</u>	
Total investment income	110,673,511	
Investment activity expense		
Management fees	(16,181,474)	
Custodial fees	(74,087)	
Consulting fees	(10,435)	
Allocated administration expense	<u>(328,106)</u>	
Total investment expense	(16,594,102)	
Net income from investment activities		94,079,409
Securities lending activities		
Total Securities lending income	180,294	
Total securities lending expense	<u>(124,963)</u>	
Net income from securities lending activities		<u>55,331</u>
Total net investment income		<u>94,134,740</u>
Total additions		\$148,535,337

**Deductions**

Annuity benefits	71,721,421	
Disability benefits	1,393,759	
Survivor benefits	4,363,011	
Refunds of employee contributions	360,176	
Administrative expense	<u>618,207</u>	
Total deductions		<u>78,456,574</u>
Net Increase		70,078,763

Net position restricted for pension benefits

Beginning of fiscal year 1,365,844,260**End of fiscal year** **\$1,435,923,023**

See accompanying notes to financial statements.

## Notes on Financial Statements

The Fairfax County Police Officers Retirement System is a legally separate single-employer defined benefit pension plan established under the Code of Virginia to provide defined pension benefits to certain Fairfax County, Virginia ("County") police. As such, the System is considered part of the County reporting entity and its financial statements are included in the County's basic financial statements as a pension trust fund.

## Note 1. Summary of Significant Accounting Policies

### A. Basis of Accounting

The System's basic financial statements have been prepared under the accrual basis of accounting in accordance with accounting principles applicable to governmental units in the United States of America. Member and employer contributions to the plan are recognized in the period in which the contributions are due pursuant to legal requirements. Benefits and refunds are recognized when due in accordance with the terms of the plan. The cost of administering the plan is paid by the System.

For financial reporting purposes, the System adheres to accounting principles generally accepted in the United States of America. The System applies all applicable pronouncements of the Governmental Accounting Standards Board (GASB).

### B. Method Used to Value Investments

Short-term investments are reported at cost, which approximates fair value. All other investments are reported at fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. Asset-backed securities are valued on the basis of future principal and interest payments and are discounted at prevailing interest rates for similar instruments. Because of the inherent uncertainty in valuing these securities, the fair value may differ from the values that would have been used had a ready market for such securities existed. Accordingly, the realized value received upon the sale of the assets may differ from the fair value. The System records investment purchases and sales as of trade date. These transactions are not finalized until the settlement date, which occurs approximately three business days after the trade date. The amounts of trade receivables and payables are shown as receivables and payables on the Statement of Fiduciary Net Position.

Cash received as collateral on securities lending transactions and investments made with such cash are reported as assets along with a related liability for collateral received. The fair values of private investments and private real estate are generally lagged by at least one quarter due to the timing of receipt of private market valuations and information.

### C. Equity in County's Pooled Cash and Temporary Investments

The System maintains cash with the County, which invests cash and allocates interest earned, net of a management fee, on a daily basis to the System based on the System's average daily balance of equity in pooled cash. As of June 30, 2018, the bank balance of the County's public deposits was either insured by the Federal Deposit Insurance Corporation or through the State Treasury Board pursuant to the provisions of the Security for Public Deposit Act. The County's investments are exposed to various risks such as interest rate, market and credit risks. Such risks, and the resulting investment security values, may be influenced by changes in economic conditions and market perceptions and expectations. Accordingly, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect the amounts reported in the financial statements.

### D. Compensated Absences

Employees are granted vacation and sick leave based on their length of service. Unused annual and compensatory leave is payable to employees upon termination based on the employees' current rate of pay, up to certain limits. Sick leave does not vest with the employees; however, it is converted to years of service upon retirement. In addition, employees may accrue compensatory leave for hours worked in excess of their scheduled hours. Compensatory leave in excess of 240 hours is forfeited at the end of the calendar year.

## Notes on Financial Statements

(continued)

Compensated Absences	
FY 2018 Beginning Balance	\$44,987
Leave Earned	35,494
Leave Used	24,647
FY 2018 Ending Balance	55,834
Due within one year	25,036

### Note 2. Summary of Plan Provisions

#### A. Plan Description and Provision

The Police Officers Retirement System is a single-employer defined benefit pension plan. Benefit provisions are established and may be amended by County ordinance. All benefits vest at five years of service. The general provisions of the Police Officers Retirement System are as follows:

##### *Membership.*

The plan covers County police officers who are not covered by other plans of the County or the Virginia Retirement System. Members sworn before January 1, 2013, are members of Plan A. Members sworn on or after January 1, 2013, are members of Plan B.

##### *Contribution Rate.*

The member contribution rate is set by the County Ordinance and is currently 8.65 percent of base salary. The County contribution rate is set by the actuarial process and was 38.98 percent for fiscal year 2018. Police Officers do not participate in Social Security.

##### *Normal Retirement.*

To be eligible for normal retirement, an individual must meet the following criteria: (a) if employed before July 1, 1981; attained the age of 55 or completed 20 years of service, or (b) if employed on or after July 1, 1981; attained the age of 55 or completed 25 years of service.

The normal retirement benefit is 2.8 percent of average final compensation (i.e., the highest consecutive three years) multiplied by credited service at date of termination, and increased by 3 percent.

##### *Early Retirement.*

A member is eligible for early retirement upon attaining at least 20 years of creditable service. This is the normal retirement benefit calculated using average final compensation and service at early retirement, actuarially reduced, and increased by 3 percent.

##### *Deferred Retirement Option Program (DROP).*

Those eligible for normal retirement may enter DROP for a period of up to three years. Members can only participate in DROP once, and their election is irrevocable.

##### *Deferred Vested Retirement.*

Deferred vested retirement is available for vested members (vesting is at 5 years of service), who leave their contributions in the System when they terminate employment. At age 55, these members are entitled to their normal retirement benefit based on service with the Police Department.

##### *Service-Connected Disability Retirement.*

Service-connected disability retirement is available for members, regardless of their length of service, who become disabled as a result of a job-related illness or injury. Benefits for total disability are 66.67 percent of the salary, reduced by any Workers' Compensation benefits. These benefits continue during the existence of the disability.

##### *Non-Service Connected Disability Retirement.*

Non-service connected disability retirement is available for vested members who become disabled due to an injury or illness that is not job-related. Normal retirement benefits are paid.

##### *Death Benefits.*

If death occurs prior to retirement:

An automatic monthly benefit is payable to the member's spouse and children. This benefit equals \$2,309.28 for the spouse or surviving handicapped child (if there is no spouse), plus each eligible child receives \$923.71 up to a maximum total family benefit of \$4,618.56 (these benefits are indexed to inflation). If the death occurred in the line of duty, the spouse or surviving handicapped child (if there is no spouse) may elect to receive 66.67 percent of the member's regular salary at the time of death in lieu of the automatic benefits.

Notes on Financial Statements  
(continued)

If death occurs after retirement:

In addition to the automatic benefit detailed above, at the time the member retires, the Plan provides for the member to elect survivor benefit options for the Surviving Spouse or a Handicapped Child at 100 percent, 66.67 percent or 50.0 percent of the retiree’s benefit.

*Cost of Living Benefit.*

Annual cost of living adjustments (COLAs) are provided to retirees and beneficiaries and are equal to the lesser of 4.0 percent or the percentage increase in the Consumer Price Index for the Metropolitan Statistical Area that includes Fairfax County.

*Benefit Limits.*

Benefits are limited to the maximum amounts for qualified plans as set forth in Section 415 of the Internal Revenue Code. A separate, nonqualified benefit restoration plan has been established for the payment of any benefit formula amounts in excess of the Section 415 limit.

Note: Detailed provisions may be found in the Retirement Handbook for Active Employees.

**B. Board of Trustees**

Seven members serve on the Fairfax County Police Officers Retirement System. Three of the members are citizens appointed by the Fairfax County Board of Supervisors. Two of the members are elected by Fairfax County Government Employees, and one of the members is elected by retiree representatives. The Director of Finance also serves as an Ex Officio member.

**C. Membership**

At June 30, 2018, the date of the latest actuarial valuation, membership in the System consisted of:

Retirees and beneficiaries receiving benefits	1,119
Terminated vesteds	70
Deferred Retirement Option Program (DROP) participants	50
Active plan members	<u>1,350</u>
<b>Total</b>	<b><u>2,589</u></b>

**D. Deferred Retirement Option Program**

Members eligible for normal retirement may elect to enter the DROP. As a DROP member, he or she will continue to work and receive a salary for a maximum period of three years while an amount equal to what could have been received as a retirement benefit is credited to his or her DROP account. The monthly benefit that will be credited to the DROP account is determined by the years of service and Average Final Compensation at the DROP entry date. During the DROP period, the retirement plan accumulates his or her accrued monthly benefit which is payable at the end of the DROP period. The DROP account balance is credited at an annual interest rate of 5 percent, compounded monthly. At the end of the DROP period, the DROP member must terminate employment with the Fairfax County Government and will begin receiving his or her monthly retirement benefit. Upon DROP exit, the retiree can elect to receive the balance of the DROP account in the form of a lump sum distribution, a rollover to another qualified plan (or IRA), or as an addition to the monthly retirement annuity. The DROP balance as of June 30, 2018, was \$6.0 million.

**E. Contributions**

The contribution requirements of the System’s members are established and may be amended by County ordinances. Member contributions are based on 8.65 percent of compensation for the year ended June 30, 2018. The County is required to contribute at an actuarially determined rate; the rate for the year ended June 30, 2018, was 27.64 percent of annual covered payroll. The decision was made to commit additional funding and a rate of 38.98 percent was adopted for fiscal year 2018. Total contributions for the fiscal year ended June 30, 2018, amounted to \$54.4 million.

**F. Deductions**

The deductions from the System include the payment of retiree and beneficiary payments, the refund of employee contributions to former members and administrative expenses. The total deductions for the fiscal year ended June 30, 2018, amounted to \$78.5 million.

## Notes on Financial Statements

(continued)

### Note 3. Investments

#### A. Investment Policy

The authority to establish the System is set forth in Chapter 303 of the Acts of Assembly (law of the Commonwealth of Virginia). Section 26-45.1 of the Code of Virginia (Code), updated by Section 51.1-803, authorizes fiduciaries of the System to purchase investments with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with the same aims. The Board shall also diversify such investments as to minimize the risk of large losses unless under the circumstances it is clearly prudent not to do so.

The System's Board of Trustees has adopted the Police Officers Retirement System Statement of Investment Objectives and Policy which establishes a broad set of investment objectives, guidelines, risk tolerance and performance standards for the assets of the System. The Board of Trustees has the authority to amend the investment policy. The Board recognizes that investing in worldwide capital markets inherently entails the assumption of risk. The Board believes that part of the risk involved in managing the System's assets can be reduced by investing in diversified, lowly-correlated asset classes and employing different philosophies and investment management styles. The Board has selected a long-term strategic asset allocation strategy which provides a high degree of diversification, maintains appropriate asset coverage of plan liabilities, and also optimizes investment return. Investment decisions for these assets are made by the Board of Trustees or investment managers selected by the Board. The Board hires each of its investment advisory firms on the basis of its specific area of expertise as well as its fit with the total risk and return objectives of the System. Each manager exercises investment discretion around specifically mandated quality, concentration, benchmark and performance guidelines, and practices active risk controls in order to achieve the System's investment expectations.

The following was the System's adopted asset allocation policy as of June 30, 2018. The asset allocation policy commonly exceeds 100 percent because of target exposures to both direct investments in asset classes plus notional exposure to asset classes through derivative positions such as Futures held at the portfolio level. Also, the System commonly includes notional exposures for select Investment Managers that have a mandate from the Board to provide the System with additional asset class exposure using leverage or derivatives.

Asset Class	Target Exposure
Absolute Return	37.0%
Global Equity	29.0%
Global Fixed Income	30.0%
Global Multi-Asset	30.0%
Global Real Assets	8.0%

#### B. Concentrations

For the most part, the overall investment policy does not identify a specific level of credit risk, interest rate risk or foreign currency risk. That is addressed at the individual account level. The guideline for "concentration of risk" is system-wide, however. The System does not hold investments (other than U.S. Government and U.S. Government-guaranteed obligations) in any one security that represent 5.0 percent or more of net position available for benefits. All investments, except for the pooled and mutual funds, short-term investment fund and a short-term collateral investment pool are held by an unaffiliated custodian. There is no custodial credit risk since the custodian's records establish the System's interest in the securities and the custodian provides insurance for all custody assets.

#### C. Rate of Return

For the year ended June 30, 2018, the annual money-weighted rate of return on pension plan investment, net of pension plan investment expense, was 7.0 percent. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Notes on Financial Statements  
(continued)

**D. Fair Value Hierarchy**

The System measures and records its investments using fair value hierarchy measurement guidelines established by Generally Accepted Accounting Principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset and gives the highest level to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest level to unobservable inputs (Level 3 measurements).

- Level 1 Unadjusted quoted prices for identical instruments in active markets;
- Level 2 Observable inputs other than quoted market prices; and
- Level 3 Valuation derived from valuation techniques in which significant inputs are unobservable.

Investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not classified in the fair value hierarchy.

In instances where inputs used to measure fair value fall into different levels in the fair value hierarchy, fair value measurements in their entirety are categorized based on the lowest level input that is significant to the valuation. The table below shows the fair value levels of the investments.

Equities and fixed income securities classified in Level 1 are valued using prices quoted in the active markets for those securities. Securities in Level 2 and Level 3 are valued using either a bid evaluation or a matrix pricing technique. Bid evaluations may include market quotations, yields, maturities, call features and ratings. Matrix pricing is used to value securities based on the securities' relationships to benchmark quoted prices. Level 3 securities use proprietary information or single source pricing.

Fair Value Hierarchy				
	6/30/2018	Quoted Prices in		
		Active Markets for Identical Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
<b>Investments by Fair Value Level</b>				
Asset-Backed Securities	\$55,865,898	\$ -	\$55,865,898	\$ -
Convertible or Exchangeable Securities	8,890,148	-	8,890,148	-
Convertible Securities	-	-	-	-
Corporate and Other Bonds	53,390,380	-	53,390,380	-
Equity	131,635,220	131,635,220	-	-
Natural Resources	3,131,500	-	-	3,131,500
Preferred Securities	293,625	-	293,625	-
Short-Term Investments	91,981,260	-	7,660,828	84,320,432
U.S. Government Obligations	<u>49,053,811</u>	<u>-</u>	<u>49,053,811</u>	<u>-</u>
<b>Total Investment by Fair Value Level</b>	<b>\$394,241,842</b>	<b>\$131,635,220</b>	<b>\$175,154,690</b>	<b>\$87,451,932</b>
<b>Investment Measured at Net Asset Value (NAV)</b>				
Absolute Return	\$207,095,278			
Global Equity	222,606,181			
Global Fixed Income	157,406,522			
Global Real Assets	78,297,029			
Global Multi-Asset	<u>369,026,394</u>			
<b>Total Investments Measured at NAV</b>	<b>\$1,034,431,404</b>			
<b>Total Investments</b>	<b>\$1,428,673,246</b>			

## Notes on Financial Statements

(continued)

Investment Measured at NAV				
	Fair Value	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Absolute Return	\$207,095,278	\$-	Monthly, Quarterly	3 - 90 days
Global Equity	222,606,181	22,543,268	Daily, Monthly, Quarterly, None	3 - 90 days
Global Fixed income	157,406,522	120,042,500	Daily, Semi-Annually, None	5 - 90 days
Global Multi-Asset	369,026,394	-	Monthly	15 - 90 Days
Global Real Asset	<u>78,297,029</u>	<u>37,289,824</u>	Daily, None	3- 20 days
<b>Total investment measured at NAV</b>	<b><u>\$1,034,431,404</u></b>	<b><u>\$179,875,592</u></b>		

*Absolute Return.*

Global Macro:

This type includes two hedge funds. The first one has 100+ active ideas across fixed income, currencies, equities and commodities. The process is equally driven by analysis of the macro environment, flows of capital, and the expected reaction to changes in interest rates and other drivers. The fair values of the investments in this type have been determined using NAV per share (or its equivalent) of the investments. The second one is a Commodity Trading Advisor (CTA) that analyzes market prices to determine trends then uses tactical asset allocation to capture and ride market trends. The Fund is a diversified portfolio with exposure to currencies, commodities, bonds and short interest rates, and equity indices at various times. These exposures are typically achieved through the use of derivatives which allows quick response because of the high liquidity in the derivative markets. The fair values of the investments in this type have been determined using NAV per share (or its equivalent) of the investments.

Multi-strategy:

This type includes two hedge funds. The first manager sells volatility (e.g. put options) on, and provides exposure to, multiple asset classes including: U.S. Large Cap Equity, U.S. Small Cap Equity, International Developed Equity, Emerging Markets Equity, High Yield Credit, Barclays Aggregate, Long-Dated Treasuries, Commodities, Foreign Exchange and VIX Volatility Index. Option implied volatility on many markets and related exchange traded funds is consistently higher than subsequent realized volatility, creating a structural opportunity. The fair values of the investments

in this type have been determined using NAV per share (or its equivalent) of the investments. The second fund is a stub position.

Event Driven:

This type includes two hedge funds. The first one focuses on global long/short credit and event driven positions, investing across the capital structure. The fund is directionally agnostic and over time has been net long and opportunistically net short. The fair values of the investments in this type have been determined using NAV per share (or its equivalent) of the investments. The second fund is a stub position.

Relative Value:

This type includes one hedge fund. The manager seeks to harvest risk premium from four return sources that have traditionally shown up as alpha, but as investors and attribution modeling have become more sophisticated, have become increasingly characterized as alternative or "style" premiums such as: Value – Tendency for relatively cheap assets to outperform relatively expensive ones; Momentum – Tendency for recent relative performance to continue in the near future; Carry – Tendency for higher-yielding assets to provide higher returns than lower; Defensive – Tendency for lower-risk, high-quality assets to generate higher returns. They implement long and short relative value strategies to capture these structural returns across multiple asset classes including: equity sectors, equity indices, fixed income, currency, and commodities. The fair value of this hedge fund has been determined using the NAV per share of the investments.

Notes on Financial Statements  
(continued)

*Global Equity.*

U.S. Equities:

This type includes three hedge funds, one private fund and two traditional funds. The first one is a bundled portable alpha mandate which uses futures on the S&P 500 Index and ports it to a fundamental global macro/ fixed income fund. The fund has exposure to interest rates, foreign exchange, equity indices and commodities. However, the majority of its exposure is generally to interest rates. It differs from the average macro fund in that it will also have exposure (albeit very limited) to credit (both IG & HY), mortgages (Residential Mortgage Backed Securities & Commercial Mortgage Backed Securities) and Asset-Backed Securities. The second one is a U.S. small cap deep value long/short equity fund. The team looks for companies with management or capital structure issues. They identify undervalued companies and then perform a fundamental value analysis to find catalysts that may spark change in the company. The Fund will then, on its own or together with other members of a group, acquire a controlling interest in the company and then force management to enact the changes they feel are necessary for a turnaround. The fair values of each of these hedge funds has been determined using the NAV per share of the investments. The third one is based on the fundamental concepts of value (buying securities that are cheap and selling those that are expensive) and momentum (buying securities that are getting better and selling those that are getting worse) investing. The fund applies both concepts through the use of numerous proprietary indicators across many sectors, while generally giving more weight to value than momentum. This is a long/short strategy that maintains a net 100 percent invested position by investing 130 percent of portfolio assets in long positions and 30 percent in short positions.

The private fund focuses on acquiring minority equity stakes in institutionalized hedge fund and private equity firms with assets under management in excess of \$1.0 billion.

International Equities:

The two traditional funds are both international. The first one is an international small cap fund that uses a quantitative approach. In addition to traditional value measures such as price/earnings and price/book ratios, the firm also considers growth-related factors, such as price momentum and trends in analysts' earnings estimates, to target undervalued companies that have strong prospects for future outperformance. The second one seeks long term capital appreciation by investing primarily in companies located in emerging market countries and opportunistically, in frontier market countries. The portfolio typically holds 30-50 companies within global emerging markets. Country and sector exposures are primarily a by-product of individual stock selection.

*Global Fixed Income.*

This type includes one fund and six private debt funds. The fund provides exposure to senior bank loans as well as ABS, CMBS and MBS. The private debt funds provide broad exposure to Direct Lending as well as Opportunistic Credit.

Direct Lending:

This strategy conducts middle market corporate and commercial mortgage direct lending with negotiated senior secured loans to borrowers that are too small to attract the attention of conventional banks and lenders. These investments cannot be redeemed. Instead, the nature of the investments in these private debt funds are that distributions are received through the liquidation of underlying assets of the funds over a period of years as per the terms of the fund. Loan payments are also distributed on a monthly or quarterly basis. The loans are held at book value unless a payment default has occurred at which time a third-party appraisal value is determined.

Opportunistic Credit:

Opportunistic Credit includes opportunistic/ distressed funds investing in public and private debt, equity and real estate as opportunities present themselves. These investments cannot

## Notes on Financial Statements

(continued)

be redeemed. Instead, the nature of the investments in these private debt funds are that distributions are received through the liquidation of underlying assets of the funds over a period of years as per the terms of the fund. The fair values of the investments in this type have been determined monthly or quarterly using NAV per share (or its equivalent) of the investments.

### *Global Multi-Asset.*

This type includes three funds that invest across asset classes using a risk balanced approach in their asset allocation of the Funds with the intent to balance risk across all four combinations of Rising and Falling Growth and Inflation. The main goal is to construct a portfolio that achieves the best risk adjusted return at a 10 percent expected volatility by overweighting the lower risk asset classes and balance expected returns in inflationary, deflation,

high growth and low growth periods. This is achieved through the use of derivatives and liquid long positions across multiple asset classes. The fair values of the investments in this type have been determined using NAV per share (or its equivalent) of the investments.

### *Global Real Assets.*

This type includes two funds. The first fund focuses on publicly traded REITs, listed infrastructure, commodities, MLPs, natural resource equities (including timber and agriculture), precious metals, TIPS, and floating rate/bank loans. The strategy will set long term strategic allocations to those asset classes with broad ranges and the portfolio will be tactically reviewed on a quarterly basis. A second fund purchases interests in other private real estate funds on the secondary market.

### **E.Quality Ratings**

The System's investment quality ratings at June 30, 2018, for the separately managed fixed income accounts, were as follows:

Type of Investment	Fair Value	Ratings	Percentage of Fixed
US Government Obligations	\$49,053,811	AA	29.3%
Asset-Backed Securities	\$655,971	AAA	0.4%
	14,274,029	AA	8.6%
	83,720	A	0.1%
	1,317,479	BBB	0.8%
	725,345	BB	0.4%
	1,077,065	B	0.6%
	3,043,897	CCC	1.8%
	1,959,568	CC	1.2%
	985,964	D	0.6%
	31,742,860	Unrated	19.0%
Corporate and Other Bonds	87,668	AAA	0.1%
	561,147	AA	0.3%
	2,165,164	A	1.3%
	6,570,135	BBB	3.9%
	28,602,432	BB	17.1%
	13,995,095	B	8.3%
	4,475,351	CCC	2.7%
	<u>5,823,536</u>	Unrated	<u>3.5%</u>
<b>Total Fixed Income</b>	<b><u>\$167,200,237</u></b>		<b>100.0%</b>
<b>Short-Term Investments</b>			
Cash and Cash Equivalents	\$9,987,837	Unrated	
Police Enhanced STIF*	<u>84,320,432</u>	Unrated	
<b>Total Short-Term Investments</b>	<b><u>\$94,308,269</u></b>		

\*Short-term investment funds

As of June 30, 2018, the fixed income portfolio, excluding pooled funds, consisted of 44.8 percent invested in investment grade securities, 32.7 percent invested in securities rated below-investment-grade and 22.5 percent invested in unrated securities.

The Barclays Capital Aggregate Bond Index (BCAG) is the standard benchmark against which the industry and the System's Board measures its fixed income portfolio performance and volatility. The System's fixed income managers have discretion, within circumscribed limits, to extend the duration of their portfolios beyond that of the BCAG if they forecast falling interest rates (and thus higher bond prices). Conversely, if managers anticipate that the general level of interest rates will rise, they have the ability to shorten the duration of their portfolio and thus reduce the portfolio's sensitivity to rising rates.

**Financial Section**

**Notes on Financial Statements**  
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**F. Sensitivity to Interest Rate Risk**

The System's investments' sensitivity to interest rates at June 30, 2018, were as follows:

Investment Type	Fair Value	Option Adjusted Duration (yrs)	Percentage of Fixed
US Government Obligations	49,053,811	5.7	29.3%
Corporate and Other Bonds	62,280,528	3.5	37.2%
Asset-Backed Securities	<u>55,865,898</u>	<u>6.7</u>	<u>33.5%</u>
<b>Total Fixed Income</b>	<b><u>\$167,200,237</u></b>	<b><u>5.2</u></b>	<b><u>100.0%</u></b>
<b>Short-Term Investments</b>			
Cash and Cash Equivalents	9,987,837	0.0	
Police Enhanced STIF*	<u>84,320,432</u>	<u>0.1</u>	
<b>Total Short-Term Investments</b>	<b><u>94,308,269</u></b>	<b><u>0.1</u></b>	

\*Short-term investment funds

The duration of the System's overall fixed income portfolio excluding pooled fund was 5.2 years for the separately managed accounts. BCAG's established option-adjusted duration was 6.0 years.

**G. Short-term Investments**

The short-term investments of \$94.3 million includes a position of \$84.3 million of commingled cash held by our investment managers and cash held by the System in an enhanced short term investment fund managed by our custodian.

**H. Foreign Currency Risk**

The foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of the investment. A portion of the developed markets currency exposures is hedged. The System's investments at June 30, 2018, held in currencies other than U.S. dollars were as follows:

International Securities	Short-Term & Other Investments	Convertible & Fixed Income	Equity	Total
Argentina Peso	\$ -	\$789,305	\$ -	\$789,305
Australian Dollar	-	-	5,241,398	5,241,398
Brazil Real	2,316	-	1,613,589	1,615,905
Canadian Dollar	21	-	3,655,376	3,655,397
Colombian Peso	-	823,512	-	823,512
Danish Krone	-	-	1,892,253	1,892,253
Euro Currency Unit	5,983	-	23,811,487	23,817,470
Hong Kong Dollar	6	-	9,880,131	9,880,137
Indonesian Rupiah	-	49,513	-	49,513
Israeli Shekel	-	-	61,398	61,398
Japanese Yen	19,998	-	18,685,252	18,705,250
Malaysian Ringgit	-	18,348	-	18,348
Mexican Peso	-	2,361,052	1,582,462	3,943,514
Norwegian Krone	-	-	701,950	701,950
Polish Zloty	1	127,659	-	127,660
Pound Sterling	-	193,096	10,063,065	10,256,161
Singapore Dollar	-	214,898	341,781	556,679
South African Rand	-	794,644	-	794,644
South Korean Won	-	-	1,343,334	1,343,334
Swedish Krona	-	-	3,108,635	3,108,635
Swiss Franc	1	-	3,849,522	3,849,523
Thailand Baht	(2)	-	403,047	403,045
Turkish Lira	<u>1</u>	<u>-</u>	<u>84,434</u>	<u>84,435</u>
<b>Grand Total</b>	<b><u>\$28,325</u></b>	<b><u>\$5,372,027</u></b>	<b><u>\$86,319,114</u></b>	<b><u>\$91,719,466</u></b>

## Notes on Financial Statements (continued)

### I. Derivative Financial Instruments

In accordance with the Board's investment policies, the System regularly invests in derivative financial instruments in the normal course of its investing activities to enhance return on investment and manage exposure to certain risks within the System. The System also enters into derivative transactions to gain exposure to currencies and markets where derivatives are the most cost-effective instrument. Derivative instruments are financial contracts whose values depend on the values of one or more underlying assets, reference rates or financial indices. During fiscal year 2018, the System had exposure to various derivatives including asset-backed securities, collateralized mortgage obligations, exchange-traded futures contracts, forward currency contracts, options, swaps and floating rate securities. Some securities, such as structured notes, can have derivative-like characteristics where the return may be linked to one or more indexes. Asset-backed securities, such as collateralized mortgage obligations (CMOs), are sensitive to changes in interest rates and pre-payments. It should also be noted that the System has exposure to derivatives indirectly through its ownership interests in certain hedge funds, mutual funds and commingled funds which may use, hold or write derivative financial instruments.

Derivative investments may involve, to varying degrees, elements of credit and market risk in excess of amounts recognized on the financial statements. Market risk results from the fluctuations in interest rates and currency rates. The credit risk of these investments is associated with the creditworthiness of the related parties to the contracts. The System could be exposed to risk if the counterparties to the contracts are unable to meet the terms of the contracts. Holders of futures contracts look to the exchange for performance under the contract and not to the other party holding the offsetting futures position. Accordingly, the amount at risk due to nonperformance of counterparties to futures contracts is minimal. For counterparties involving over the counter derivatives, the Board seeks to control this risk through counterparty credit evaluations, counterparty credit limits, and exposure monitoring procedures conducted by investment managers and staff.

At June 30, 2018, the System held the following three types of derivative financial instruments: futures, swaps and currency forwards. These three types of derivatives provide the System with the opportunity to build passive benchmark positions, enhance returns, and gain market exposure to various indices in a more efficient way and at lower transaction costs. Credit risks depend on whether the contracts are exchange-traded or exercised over-the-counter. Market risks arise from adverse changes in market prices, interest rates and foreign exchange rates.

Investment managers are prohibited from purchasing securities on margin or using leverage unless specifically permitted within the investment manager's guidelines. Derivative instruments covered under the scope of GASB 53 are reported at fair value. The change in fair value of derivative instruments that are used for investment purposes are reported within the investment revenue classification. Gains and losses on derivative securities are determined based upon fair values as determined by our custodian and recorded in the Statement of Changes in Fiduciary Net Position.

#### *Futures.*

Futures contracts are contracts to deliver or receive securities at a specified future date and at a specified price or yield. Futures contracts are traded on organized exchanges (exchange-traded) and typically require an initial margin (collateral) in the form of cash or marketable securities. The net change in the futures contract value is settled daily, in cash, with the exchanges. The net gains or losses resulting from the daily settlements are included in the System's financial statements. Holders of futures contracts look to the exchange for performance under the contract and not to the entity holding the offsetting futures position. Accordingly, the amount at risk posed by nonperformance of counterparties to futures contracts is minimal.

## Notes on Financial Statements

(continued)

The notional value of the System's investment in futures contracts at June 30, 2018, were as follows:

Types of Futures	Base Exposure	Notional Cost
Cash and cash equivalents		
Short	(\$82,827,120)	(\$83,828,231)
Equity		
Long	152,047,410	156,026,995
Fixed income securities		
Long	<u>79,330,227</u>	<u>78,606,802</u>
<b>Total</b>	<b><u>\$148,550,517</u></b>	<b><u>\$150,805,566</u></b>

### Swaps.

The System enters into several types of swap contracts, in which two counterparties agree to exchange one stream of payments for another over some agreed to period of time. Swaps are used to manage risk and enhance returns. All counterparties are rated A or better. The following is the information on the System's swap contracts outstanding at June 30, 2018:

Fixed income securities	Fair Value	Base Exposure
Cleared credit default swaps	(\$699,468)	(\$667,576)

### Currency Forwards.

Currency forwards represent foreign exchange contracts. They are used to affect settlements and to protect the base currency value of portfolio assets denominated in foreign currencies against fluctuations in the exchange rates of those currencies, or to gain exposure to the change in fair value of a specific currency. A forward foreign currency exchange contract is a commitment to purchase or sell a foreign currency at a future date and at a negotiated price. The credit risk of currency contracts that are exchange-traded lies with the clearinghouse of the exchange where the contracts are traded. The credit risk of currency contracts traded over-the-counter lies with the counterparty, and exposure usually is equal to the unrealized profit on in-the-money contracts. All counterparties are rated A or better. The market risk in foreign currency contracts is related to adverse movements in currency exchange rates. The following is the summary information on the System's currency forward contracts at June 30, 2018:

Foreign Currency Contracts Purchased	Notional (local currency)	Cost	Fair Value Payable in U.S. Dollars	Unrealized Gain/(Loss)
Euro Currency Unit	(1,372,000)	\$1,673,845	(\$1,613,017)	\$60,828
Japanese Yen	(253,382,000)	2,366,883	(2,299,908)	66,975
Pound Sterling	(357,000)	492,811	(472,736)	20,075
South African Rand	(10,240,000)	<u>813,202</u>	<u>(744,270)</u>	<u>68,932</u>
		<u>\$5,346,741</u>	<u>(\$5,129,931)</u>	<u>\$216,810</u>

## Notes on Financial Statements

(continued)

### J. Securities Lending

The Board of Trustees' policies permit the System to lend its securities to broker/dealer and other entities (borrowers) for collateral that will be returned for the same securities in the future. The System's custodian is the agent in lending the plan's domestic securities for collateral of 102.0 percent and international securities of 105.0 percent of the fair value. The custodian receives cash or securities as collateral from the borrower. All securities loans can be terminated on demand by either the System or the borrower. Securities received as collateral are not reported as assets and liabilities on the balance sheets since the Retirement System does not have the ability to pledge or sell the collateral securities absent borrower default.

The System did not impose any restrictions during fiscal year 2018 on the amounts of loans the lending agent made on its behalf. At June 30, 2018, the

System had no credit risk exposure to borrowers because the amounts the System owed the borrowers exceeded the amounts the borrowers owed the System. The custodian provides full indemnification to the System for any losses that might occur in the program due to the failure of a broker/dealer to return a borrowed security or failure to pay the System income earned on the securities while on loan. Cash collateral is invested in a separate account with the lending agent which includes a larger allocation to equity repurchase securities.

At June 30, 2018, cash collateral had a weighted-average maturity of two days. The maturities of the resulting investments generally match the maturities of the securities lending arrangements. While the System bears no credit risk from the failure of a borrower to return a borrowed security, it does bear risk from investing the collateral.

The following represents the balances relating to the securities lending transactions at June 30, 2018:

Securities Lent	Underlying Securities	Cash Collateral Investment Value	Securities Collateral Investment Value
Lent for Cash Collateral			
Corporate and Other Bonds	\$1,477,409	\$1,518,360	
Common and Preferred Stock	7,846,521	8,088,936	
Lent for Securities Collateral			
US Government	4,810,781	-	\$5,292,059
Common and Preferred Stock	<u>16,229,187</u>	<u>-</u>	<u>18,029,776</u>
<b>Total Securities Lent</b>	<b><u>\$30,363,898</u></b>	<b><u>\$9,607,296</u></b>	<b><u>\$23,321,835</u></b>

### K. Reclassifications

During the fiscal year 2018, the System requested that investment managers for commingled funds provide the management fees associated with commingled funds. Previously, such management fees had been netted against investment income. Accordingly, the System revised the classification

to report these management fees as an investment activity expense on the Statement of Changes in Fiduciary Net Position, rather than netting the management fees against investment income. This change in classification has no effect on the financial statements for any period.

Notes on Financial Statements  
(continued)

**Note 4. Net Pension Liability, Actuarial Methods and Assumptions**

**A. Net Pension Liability**

The components of the net pension liability at June 30, 2018, were as follows:

Total pension liability	\$1,713,294,651
Plan fiduciary net position	<u>1,435,923,023</u>
Net pension liability	\$277,371,628
Plan fiduciary net position as a percentage of the total pension liability	83.8%

**B. Actuarial Methods and Assumptions**

The Total Pension Liability was determined by an actuarial valuation as of June 30, 2018, using the following actuarial assumptions, applied to all periods included in the measurement.

Discount rate, net of plan investment expenses	7.25%
Inflation	2.75%
Salary increase, including inflation	2.75% + Merit
Investment rate of return, net of plan investment expenses	7.25%
Municipal bond rate	N/A
Projected period of unfunded benefit payments	None

The actuarial assumptions used have been recommended by the actuary and adopted by the System’s Board of Trustees based on the most recent review of the System’s experience presented at a Board meeting on April 13, 2016.

The rate of employer contributions to the System is composed of normal cost, amortization of the unfunded actuarial accrued liability and an allowance for administrative expenses. The normal cost is a level percent of payroll cost which, along with the member contributions, will pay for projected benefits at retirement for each plan participant. The actuarial accrued liability is that portion of the present value of projected benefits

that will not be paid by future normal employer costs or member contributions. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial accrued liability. The allowance for administrative costs is based upon the System’s actual administrative expenses.

The County is required to contribute at an actuarially determined rate; the rate for the year ended June 30, 2018, was 27.64 percent of annual covered payroll. The decision was made to commit additional funding and a rate of 38.98 percent was adopted for fiscal year 2018. Since the System’s adjusted funded ratio (the ratio of the sum of the actuarial value of assets and commitments already made to fund changes to the actuarial accrued liability) has fallen below 90.0 percent, the contribution rate includes a margin to amortize this shortfall back to the 90.0 percent level. In fiscal year 2011 the target was increased to a 91.0 percent level, with the 2015 fiscal year contribution it was increased to 93.0 percent, with the 2016 fiscal year contribution it was increased to 95.0 percent, and with the 2017 fiscal year contribution was increased again to 97.0 percent and with the 2018 fiscal year contribution it was increased to 98.0 percent. The intent of the County is to continue increasing the amortization target until full actuarial funding has been restored. The goal is to reach an amortization to 100 percent in contributions at or before fiscal year 2020.

Mortality rates with adjustments for mortality improvements were based on 110 percent and 100 percent of the RP-2014 Healthy Annuitant Mortality Table for males and females respectively, projected using the RPEC-2015 model, with an ultimate rate of 0.65 percent for ages 20-85 grading down to an ultimate rate of 0 percent for ages 115-120 and convergence to the ultimate rate in the year 2015. Twenty percent of pre-retirement deaths are assumed to be service-connected.

The actuarial assumptions used in the June 30, 2018, valuation were based on the results of an actuarial experience study for the period July 1, 2010 to June 30, 2015.

## Notes on Financial Statements

**C. Long Term Expected Rate of Return**

The long term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of arithmetic excess rates of return (over cash) for each major asset class included in the System's target asset allocation as of June 30, 2018, are summarized below.

Asset Class	Long Term Expected Real Rate of Return
Absolute Return	7.00%
Core Fixed Income	1.80%
High Yield	4.25%
International Developed Mkt. Equities	4.35%
International Emerging Mkt. Equities	7.20%
Real Assets	4.65%
Risk Parity	6.00%
US Equities	4.65%

**D. Discount Rate**

The discount rate used to measure the total pension liability was 7.25 percent. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and that County contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

In making this determination, we assumed the outflows would equal the anticipated benefit payments from the 2017 actuarial valuation. The administrative expenses attributable to current actives were assumed to equal 0.40 percent of covered payroll. The inflows to the plan were assumed to continue at the average aggregate rate for the 2017 active population of 8.65 percent of payroll and County contributions were projected at 38.98 percent for fiscal year 2018, with continued increases to 41.92 percent to be contributed until 2030. After that time the County contribution was assumed to drop to the normal cost plus expenses (17.90 percent) since the unfunded actuarial liability is expected to be fully funded by that time.

**E. Sensitivity of the Net Pension Liability to Changes in the Discount Rate**

The following presents the net pension liability of the County, calculated using the discount rate of 7.25 percent, as well as what the County's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.25 percent) or 1-percentage-point higher (8.25 percent) than the current rate.

	Sensitivity of Net Pension Liability		
	1% Decrease 6.25%	Discount Rate 7.25%	1% Increase 8.25%
Total Pension Liability	\$1,952,475,193	\$1,713,294,651	\$1,517,729,153
Plan Fiduciary Net Position	<u>1,435,923,023</u>	<u>1,435,923,023</u>	<u>1,435,923,023</u>
Net Pension Liability	\$516,552,170	\$277,371,628	\$81,806,130
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	73.5%	83.8%	94.6%

**Note 5. Income Taxes**

The Internal Revenue Service issued the System a determination letter which stated that the System and its underlying trust qualify under the applicable provisions of the Internal Revenue Code and therefore are exempt from federal income taxes.

**Financial Section**

**Required Supplementary Information (Unaudited)**

<b>Schedule of Changes in the Net Pension Liability and Related Ratios</b>					
Year Ended June 30					
	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>Total Pension Liability</b>					
Service cost	\$30,743,227	\$29,051,739	\$30,913,269	\$30,389,897	\$30,858,609
Interest	118,405,143	112,637,566	110,362,493	106,739,905	102,492,490
Changes in benefit terms	-	-	-	-	-
Differences between expected and actual experience	1,315,247	11,638,382	(30,820,874)	(11,515,790)	-
Changes in assumptions	-	-	9,895,400	-	-
Benefit payments, including refunds of member contributions	<u>(77,838,367)</u>	<u>(73,175,998)</u>	<u>(70,749,811)</u>	<u>(67,757,160)</u>	<u>(62,287,705)</u>
<b>Net change in Total Pension Liability</b>	72,625,250	80,151,689	49,600,477	57,856,852	71,063,394
<b>Total Pension Liability - beginning</b>	<u>1,640,669,401</u>	<u>1,560,517,712</u>	<u>1,510,917,235</u>	<u>1,453,060,383</u>	<u>1,381,996,989</u>
<b>Total Pension Liability - ending (a)</b>	<u>\$1,713,294,651</u>	<u>\$1,640,669,401</u>	<u>\$1,560,517,712</u>	<u>\$1,510,917,235</u>	<u>\$1,453,060,383</u>
<b>Plan Fiduciary Net Position</b>					
Contributions - employer	\$44,504,675	\$43,381,151	\$40,646,884	\$37,867,181	\$34,178,960
Contributions - member	9,895,922	9,631,618	9,324,066	8,889,931	10,091,331
Net investment income	94,134,740	116,099,350	10,764,028	41,601,153	176,683,610
Benefit payments, including refunds of member contributions	<u>(77,838,367)</u>	<u>(73,175,998)</u>	<u>(70,749,811)</u>	<u>(67,757,160)</u>	<u>(62,287,705)</u>
Administrative expenses	<u>(618,207)</u>	<u>(481,574)</u>	<u>(510,544)</u>	<u>(443,230)</u>	<u>(431,064)</u>
<b>Net change in Plan Fiduciary Net Position</b>	70,078,763	95,454,547	(10,525,377)	20,157,875	158,235,132
<b>Plan Fiduciary Net Position - beginning</b>	<u>1,365,844,260</u>	<u>1,270,389,713</u>	<u>1,280,915,090</u>	<u>1,260,757,215</u>	<u>1,102,522,083</u>
<b>Plan Fiduciary Net Position - ending (b)</b>	<u>\$1,435,923,023</u>	<u>\$1,365,844,260</u>	<u>\$1,270,389,713</u>	<u>\$1,280,915,090</u>	<u>\$1,260,757,215</u>
<b>Net Pension Liability - ending (a)-(b)</b>	<u>277,371,628</u>	<u>274,825,141</u>	<u>290,127,999</u>	<u>230,002,145</u>	<u>192,303,168</u>
<b>Plan Fiduciary Net Position as a Percentage of the Total Pension Liability</b>	83.8%	83.2%	81.4%	84.8%	86.8%
<b>Covered Payroll</b>	<u>\$114,173,102</u>	<u>\$111,290,793</u>	<u>\$107,021,811</u>	<u>\$102,844,055</u>	<u>\$100,912,194</u>
<b>Net Pension Liability as a Percentage of Covered Payroll</b>	242.9%	246.9%	271.1%	223.6%	190.6%

*This schedule is intended to show information for 10 years. Additional years will be displayed as they become available.*

The total pension liability contained in this schedule was calculated by Cheiron, the System's Actuary. The net pension liability is measured as the total pension liability less the amount of the fiduciary net position of the Police Officers Retirement System.

**Required Supplementary Information**  
(continued)

<b>Schedule of Net Pension Liability</b>					
Year Ended June 30					
	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
Total Pension Liability	\$1,713,294,651	\$1,640,669,401	\$1,560,517,712	\$1,510,917,235	\$1,453,060,383
Plan Fiduciary Net Position	<u>1,435,923,023</u>	<u>1,365,844,260</u>	<u>1,270,389,713</u>	<u>1,280,915,090</u>	<u>1,260,757,215</u>
Net Pension Liability	<u>\$277,371,628</u>	<u>\$274,825,141</u>	<u>\$290,127,999</u>	<u>\$230,002,145</u>	<u>\$192,303,168</u>
Plan Fiduciary Net Position as a Percentage of the Total Plan Liability	83.8%	83.2%	81.4%	84.8%	86.8%
Covered Payroll	\$114,173,102	\$111,290,793	\$107,021,811	\$102,844,055	\$100,912,194
Net Pension Liability as a Percentage of Covered Payroll	242.9%	246.9%	271.1%	223.6%	190.6%

*This schedule is intended to show information for 10 years. Additional years will be displayed as they become available.*

<b>Schedule of Money-Weighted Rate of Return</b>	
<b>Fiscal Year</b>	<b>Annual Money-Weighted Rate of Return, Net of Investment Expense</b>
2018	7.0%
2017	9.3%
2016	0.9%
2015	3.4%
2014	16.2%
2013	6.0%
2012	-0.7%
2011	25.4%
2010	20.9%
2009	-17.9%

Required Supplementary Information  
(continued)

Schedule of Employer Contributions					
Fiscal Year	Actuarially Determined Contribution	Contributions in Relations to the Actuarially Determined Contribution	Contribution Deficiency (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
2018	\$44,504,675	\$44,504,675	\$ -	\$114,173,102	38.98%
2017	43,381,151	43,381,151	-	111,290,793	38.98%
2016	40,646,884	40,646,884	-	107,021,811	37.98%
2015	37,867,181	37,867,181	-	102,844,055	36.82%
2014	34,178,960	34,178,960	-	100,912,194	33.87%
2013	34,011,347	34,011,347	-	102,598,332	33.15%
2012	31,700,690	31,700,690	-	101,280,160	31.30%
2011	29,174,611	29,174,611	-	103,054,083	28.31%
2010	23,766,626	23,766,626	-	104,057,032	22.84%
2009	23,508,402	23,508,402	-	102,926,454	22.84%

Notes to Schedule	
Valuation Date	6/30/2016
Timing	Actuarially determined contribution rates are calculated based on the actuarial valuation one year prior to the beginning of the plan year.
Key Methods and Assumptions Used to Determine Contribution Rates:	
Actuarial cost method	Entry Age
Asset valuation method	3-year smoothed market
Amortization method	Corridor method, amortize liability outside of 98% corridor over an open 15 year period with level % of payroll.
Discount rate	7.25%
Amortization growth rate	2.75%
Price inflation	2.75%
Salary increases	2.75% plus merit component based on employee's years of service
Mortality	110% and 100% of the RP-2014 Healthy Annuitant Mortality Table for males and females respectively projected using the RPEC-2015 model, with an ultimate rate of 0.75% 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.
A complete description of the methods and assumptions used to determine contribution rates for the year ending June 30, 2018, can be found in the June 30, 2016, actuarial valuation report.	

## Required Supplementary Information

**Summary of Significant Changes to the Pension System**

The summary of employer and employee contribution rates during the past five years and other significant changes in the pension system were as follows:

Contribution Rates		
Fiscal Year	Employer	Employee
2018	38.98%	8.65%
2017	38.98%	8.65%
2016	37.98%	8.65%
2015	36.82%	8.65%
2014	33.87%	10.00%

July 2014 Member contribution rate decreased from 10 percent to 8.65 percent.

January 2013 Police officers sworn on or after January 1, 2013, will be automatically enrolled in Option B. The maximum of accrued sick leave is capped at 2,080 hours.

## Other Supplementary Information

## Schedule of Investment &amp; Consultant Expenses

For the Year Ended June 30, 2018

Investment Activity Expenses		
Investment manager fees	\$16,181,474	
Custodial fees	74,087	
Consultant Expenses		
Consultant expenses	10,435	
Allocated Administration Expense	<u>328,106</u>	
<b>Total investment and consultant expenses</b>		<b><u>\$16,594,102</u></b>

## Schedule of Administrative Expenses

as of June 30, 2018

Personnel services		
Salaries and wages	\$323,131	
Fringe benefits	<u>135,257</u>	
Total personnel services		458,388
Professional services		
Actuarial	50,483	
Audit	<u>6,447</u>	
Total professional services		56,930
Communications		
Phone charges	4,322	
Printing, binding and copying	2,496	
Postage	<u>3,225</u>	
Total communications		10,043
Supplies		
Office supplies	<u>2,363</u>	
Total supplies		2,363
Other services and charges		
Staff travel and development	1,244	
Professional membership	569	
Professional subscription	214	
Insurance	10,856	
Building rent	19,584	
Depreciation expense	434	
Computer system	36,583	
Other operating	<u>20,999</u>	
Total other services and charges		<u>90,483</u>
<b>Total Administrative Expenses</b>		<b><u>\$618,207</u></b>



**Report of Independent Auditor on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with Government Auditing Standards**

To Board of Supervisors  
County of Fairfax, Virginia

To the Board of Trustees  
Fairfax County Police Officers Retirement System

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the Fairfax County Police Officers Retirement System (the "System"), a pension trust fund of the County of Fairfax, Virginia, as of and for the year ended June 30, 2018 and the related notes to the financial statements, and have issued our report thereon dated November 5, 2018.

**Internal Control over Financial Reporting**

In planning and performing our audit of the financial statements, we considered the System's internal control over financial reporting ("internal control") to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the System's internal control. Accordingly, we do not express an opinion on the effectiveness of the System's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or, significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses.

However, material weaknesses may exist that have not been identified.

### **Compliance and Other Matters**

As part of obtaining reasonable assurance about whether the System's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

### **Purpose of this Report**

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.



Tysons Corner, Virginia  
November 5, 2018



## County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

October 18, 2018

Dear Members of the Board of Trustees:

The U.S. economy continued its near historically long growth streak over the fiscal year ending June 30, 2018. The Federal Reserve Bank continued its path of slowly tightening monetary policy, in contrast to most other central banks whose stimulative low interest rate policies are expected to persist into 2019 and perhaps beyond. U.S. equities posted their ninth consecutive year of positive returns, and outperformed international equities with the S&P 500 index gaining 14.4% versus 6.8% for the MSCI EAFE Index. Foreign equity markets were impacted by anti-establishment political trends and fears over U.S. trade policy changes. Emerging market equities underperformed the U.S. but outperformed developed international equities, though volatility saw an uptick toward the end of the year as the markets reacted to U.S. dollar strength and trade policy uncertainty. Higher interest rates resulted in a second year of negative returns for U.S. high quality fixed income, with the Bloomberg Barclays U.S. Aggregate Bond Index declining by 0.4%.

The large cap domestic equity market, as measured by the S&P 500 Index, capped off the fiscal year with a 14.4% return with all smaller cap domestic equity indices posting even greater returns. The domestic bond market, as measured by the Barclays U.S. Aggregate Bond Index, returned -0.4% over the same period. The global equity market, as measured by the MSCI All Country World Index (net), returned 10.7% for the fiscal year, and emerging markets posted slightly lower returns with the MSCI EM Index returning 8.2% over the fiscal year ending June 30, 2018.

During the quarter ended September 30th, 2017, global equities posted returns of 5.2%, according to the MSCI ACWI Index. Small-cap stocks bested large-cap equities. Returns, in US dollar terms, were boosted by a stronger euro, sterling and Canadian dollar. Energy, materials and information technology led performance; regionally, Norway, Italy and Portugal were top performers. At home, the S&P 500 gained 4.5% and the Russell 2000 Index returned 5.7% for the three months ended September 30. Growth bested value; economic growth overshadowed the fallout from hurricanes and floods, and the threat of a nuclear outburst between the U.S. and North Korea, confounding ever-expanding valuations of financial assets. Emerging market stocks maintained their lead with gains of 7.9%, according to the MSCI Emerging Markets Index, aided by Brazil, Russia and China. Real estate was the top-performing sector, dominated by China. Energy took second place with higher oil prices fueling returns. U.S. credit also fared well in the quarter ending September 30th, 2017. The Barclays U.S. Aggregate Index was in the black, pushing returns of the 2017 calendar year to just over 3.0%. High-yield debt was up 2.0% with spreads modestly tighter than the second quarter; the S&P LSTA Leveraged Loan Index returned 1.0% in the third quarter of 2017, bringing gains so far in 2017 to 3.0%. The Barclays Long Treasury Index gained 0.6%, the Barclays Long Credit Index was up 2.2%, and the Barclays Long Government/Credit



**Fairfax County Retirement Systems**  
12015 Lee Jackson Memorial Hwy, Suite 350, Fairfax, VA 22033  
Phone: 703-279-8200 \* 1-800-333-1633 \* Fax: 703-273-3185  
[www.fairfaxcounty.gov/retirement/](http://www.fairfaxcounty.gov/retirement/)

Index returned 1.5%. Yields compressed 10 basis points in the third quarter of 2017 for the Long Credit and Long Government/Credit Indices to 4.2% and 3.6%, respectively. The long Treasury yield remained unchanged at 2.8%. As in public equities, emerging markets led the pack. Emerging-market local-sovereign debt returned 3.6%, clocking returns so far in 2017 of over 14%, helped, in large part, by currency appreciation.

Global equities returned 5.7% in the fourth quarter of 2017 and 24% for the calendar year. Global stocks saw earnings per share rise nearly 19% in 2017, according to FactSet, the fastest growth since 2011. The S&P 500 Index was up 6.6% in the fourth quarter of 2017, bolstered by the prospect of corporate tax cuts. Maintaining their lead, emerging market equities gained 7.4% in the fourth quarter of 2017 and ended the year with returns of 37.3%. Healthcare and consumer discretionary dominated sector performance for the quarter, while utilities and telecommunication services lagged. Information technology led in 2017, largely driven by one stock, Chinese internet giant Tencent, which was up 114.3% for the year. Among countries, South Africa, Greece and India led performance, while Malta, Mexico and Pakistan were the stragglers. Credit also didn't miss a beat in the fourth quarter of 2017. The U.S. yield curve flattened as short rates rose but longer-dated bond yields declined. The Bloomberg Barclays U.S. Aggregate gained 0.4% in the fourth quarter. Long Treasuries and long credit maintained their trajectory, returning 2.4% and 3.2%, respectively, in the quarter. U.S. high yield gained 0.5%, while the S&P Leveraged Loans Index posted a 1.1% return. Outside of the US, the rally continued within emerging markets. Emerging market currencies were the outperformer, up 2%. Local debt, largely helped by currencies, returned 80 basis points.

Volatility dulled returns in the first quarter of 2018 amid heightening concerns around trade tensions between the United States and China. Developed market stocks outside of North America declined 1.5%, according to the MSCI EAFE Index, while emerging market equities eked out gains of 1.4%. The currency-hedged MSCI EAFE Index lost 4.3% during the quarter as most currencies strengthened against the dollar. U.S. stocks fell 3.7% in February, snapping their 15-month winning streak; they ended the quarter in the red, losing a modest 0.8%. Information technology dominated sector performance, posting strong returns globally. Credit was mostly subdued in the first quarter of 2018 with the Bloomberg Barclays Aggregate down 1.5% and the Bloomberg Barclays U.S. High Yield Index losing 0.9%; breaking from the pack, the S&P LSTA Leveraged Loan Index was up 1.4%. U.S. long credit was down 3.8%, while long Treasuries fell 3.3% with yields on the 10-year note at 2.74%. Outside the U.S., emerging markets continued to rally with local debt leading the way. The JPM GBI-EM Index returned 4.4% in the first quarter of 2018, bolstered by emerging market currencies which were up 2.5%. Hard-currency sovereign debt didn't fare as well, falling 2.0% as spreads widened.

Global equities eked out a modest 0.5% in the second quarter of 2018, according to the MSCI ACWI Index. Growth stocks outperformed value while large-cap equities bested small caps in non-U.S. markets. Bolstered by rising oil prices, energy was the strongest performing sector with gains of 10.3%. Financials and telecom sectors lagged with losses of 5.6% and 4.1%, respectively. Excluding the U.S., developed market equities were in the red at 1.2%, according to the MSCI EAFE Index, as a stronger U.S. dollar erased gains in local equity markets. The S&P 500 returned 3.4%, buoyed by a robust employment report with joblessness hitting an 18-year low in May. Value beat growth in small-cap stocks while growth outperformed value in the large caps; small-cap stocks bested large caps. Emerging markets took a hit with stocks posting their worst quarter since 2015 with losses of nearly 8% in the second quarter of 2018, according to the MSCI EM Index. Within sectors, financials, real estate and industrials were the worst performers. Emerging market currencies sold off as the U.S. dollar strengthened and the 10-year Treasury yield breached 3% for the first time in almost five years. Of note, MSCI said it would add 236 China A-share stocks to its emerging markets index, in addition to including Argentina and Saudi Arabia. The Bloomberg Barclays U.S. Aggregate Index was down 0.2% as corporate spreads remained relatively flat in the second quarter of 2018. The Bloomberg Barclays High Yield Index gained 1%, while the S&P LSTA Leveraged Loan Index was up 0.7% with loans leading high-yield performance so far this year. The U.S. Long Credit Index fell 2.7% and the U.S. Long Treasury gained 0.3% with the 10-year now yielding 2.86%.

### Police Officers Retirement System

The Police Officers Retirement System operates a balanced and diversified investment program with disciplined asset re-balancing to achieve strategic long-term goals. This disciplined investment process has been effective in achieving a long-term record of consistent asset growth.

As of June 30th, 2018, the Fairfax County Police Officers Retirement System stood at \$1.435 billion, up from \$1.365 billion at the end of fiscal year 2017. Calculating performance using a time-weighted rate of return, for the year ending 2018, the system returned +7.91%, gross of fees (+6.99%, net of fees), ranking in the 69th percentile of all public funds in the BNY Mellon Total Public Fund Universe. For the three and five-year periods (annualized), the system returned +6.29% (+5.67%, net of fees) over the last three years, ranking in the 82nd percentile, and +7.68%, (+7.22%, net of fees), over the last five years, ranking in the 69th percentile, respectively.

During the past twelve months, the System continued to focus on further diversifying risk and implemented some minor short-term, tactical asset allocation tweaks. Crestline Opportunity Fund III, PIMCO BRAVO Fund III and DoubleLine Mortgage Opportunity Fund were added to the Global Fixed Income portfolio; Landmark Partners was added to the Global Real Assets portfolio and DGV Solutions was added to the Absolute Return lineup. ESG Nexus was terminated as a portfolio level hedging strategy.

Sincerely,



Katherine Molnar, CFA  
Chief Investment Officer  
Fairfax County Police Officers Retirement System

## Investment Section

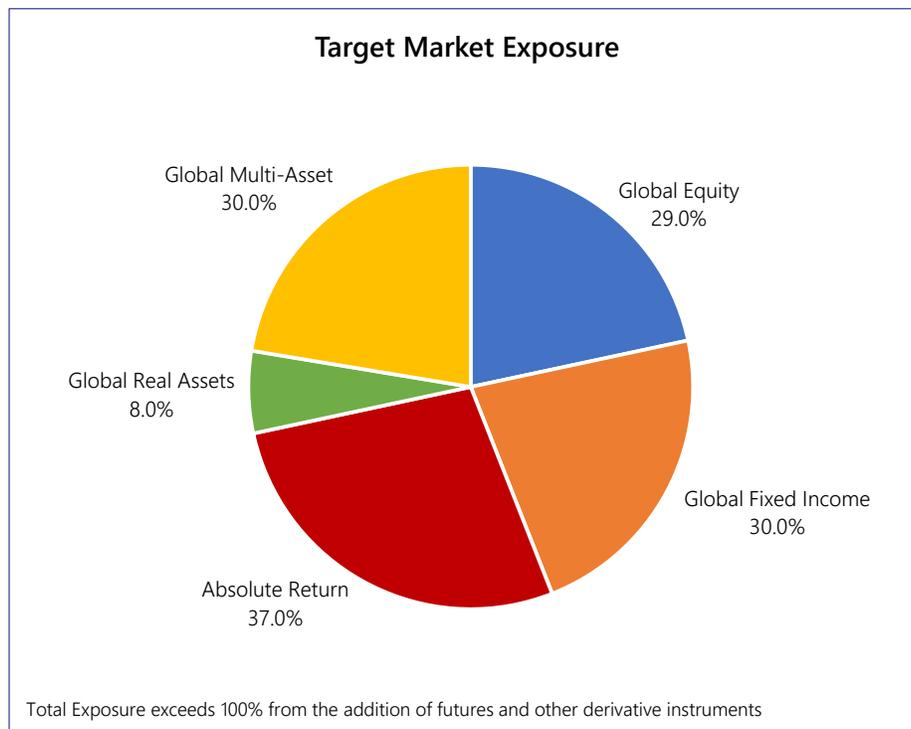
Investments by Category and Investment Manager**				
For Year Ended June 30, 2018				
Asset Class	Manager	Investment Style	Fair Value	% of Total Portfolio
<b>Absolute Return</b>				
	AlphaSimplex Group*	Global Macro	27,015,431	1.88%
	AQR Style Premia*	Relative Value	55,798,895	3.88%
	BlueCrest Capital Management*	Multi-Strategy	220,932	0.02%
	Bridgewater Pure Alpha*	Global Macro	60,968,557	4.24%
	DGV Solutions LP*	Multi-Strategy	28,855,981	2.01%
	King Street Capital*	Event Driven	6,278,158	0.44%
	Solus Alternative Asset Management*	Event Driven	28,664,360	2.00%
<b>Global Equity</b>				
	Acadian Asset Management*	Int'l Developed Small Cap	35,309,224	2.46%
	AQR Capital Management (R.C.)*	U.S. Small Cap	\$37,340,040	2.60%
	Dyal Capital Partners*	Equity	\$15,003,915	1.04%
	First Eagle Investment Management	Int'l Developed Markets Value	44,478,893	3.10%
	PIMCO StocksPlus PARS IV*	U.S. Large Cap	57,402,927	4.00%
	Sands Capital Management*	Int'l Emerging Markets	39,357,629	2.74%
	Starboard Value and Opportunity*	U.S. Small Cap	38,192,446	2.66%
	WCM Investment Management	Int'l Developed Markets Growth	57,259,600	3.99%
<b>Global Fixed Income</b>				
	Crestline Management*	Fixed Income Core	11,527,262	0.80%
	Czech Asset Management*	Private Markets Credit	13,972,385	0.97%
	Czech Asset Management*	Private Markets Credit	7,755,305	0.54%
	Double Line Capital DMO*	Fixed Income Core	31,721,087	2.21%
	DoubleLine Capital SMBS	Fixed Income Core	62,583,338	4.36%
	Loomis, Sayles & Company	Fixed Income High Yield	72,973,142	5.08%
	Marathon Asset Management LP ("Marathon")*	Fixed Income Core	17,934,465	1.25%
	Parametric Portfolio Associates TIPS	Fixed Income Core	49,332,610	3.43%
	PIMCO BRAVO *	Private Markets Credit	25,399,650	1.77%
	PIMCO BRAVO III *	Private Markets Credit	10,665,052	0.74%
	PIMCO Tactical Opportunities*	Fixed Income Core	32,126,201	2.24%
<b>Global Multi-Asset</b>				
	AQR Global Risk Premium*	Core Risk Parity	136,762,322	9.52%
	Blackrock Market Advantage*	Core Risk Parity	102,394,050	7.13%
	Bridgewater Optimal Portfolio*	Active Risk Parity	129,870,022	9.04%
<b>Global Real Assets</b>				
	Cohen & Steers Capital Management	Global Real Estate Securities	46,125,566	3.21%
	Deutsche Asset Management*	Multi-Real Asset	73,905,923	5.14%
	Landmark Partners*	Real Estate	4,391,106	0.31%
<b>Short Term</b>				
	Cash Held at County Treasurer	Operating Cash Account	2,031,836	0.14%
	BNY Mellon Cash Management	Plan Level Cash Account	5,588,295	0.39%
	BNY Mellon Cash Investment Strategies STIF	Plan Level Cash Account	1,339,860	0.09%
	Parametric Portfolio Associates	Overlay	66,018,005	4.60%
<b>Total Investments</b>			<b>\$1,436,564,469</b>	<b>100.00%</b>
* Pooled Funds		** See pages 8-9 for complete listing of investment professionals		

## Police Officers Retirement System – Allocation of Capital Exposures

### Target Asset Allocation

The asset structure shown below represents the Trustees' assessment of their optimal asset allocation as of June 30, 2018. The target asset allocation provides a reasonable expectation that the System's investment objectives can be achieved based on historical relationships of asset class performance.

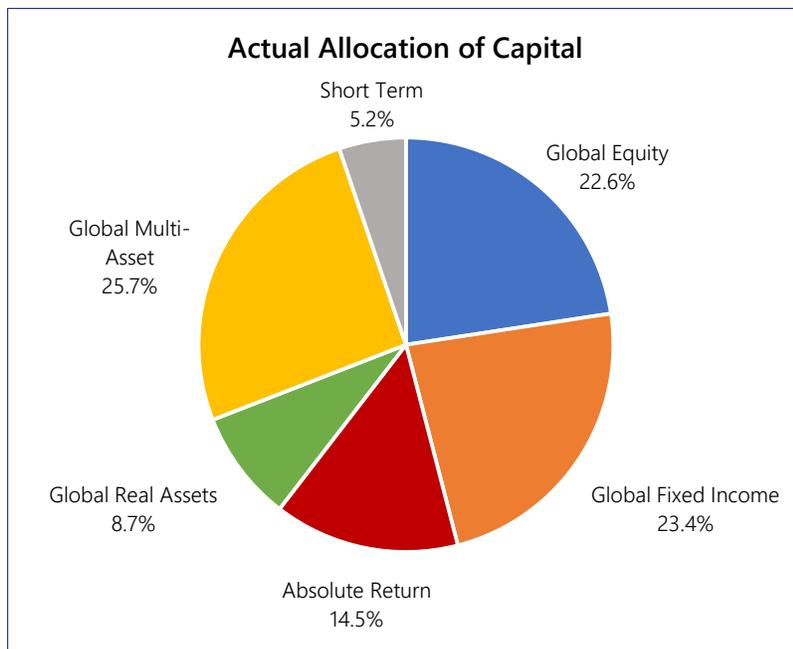
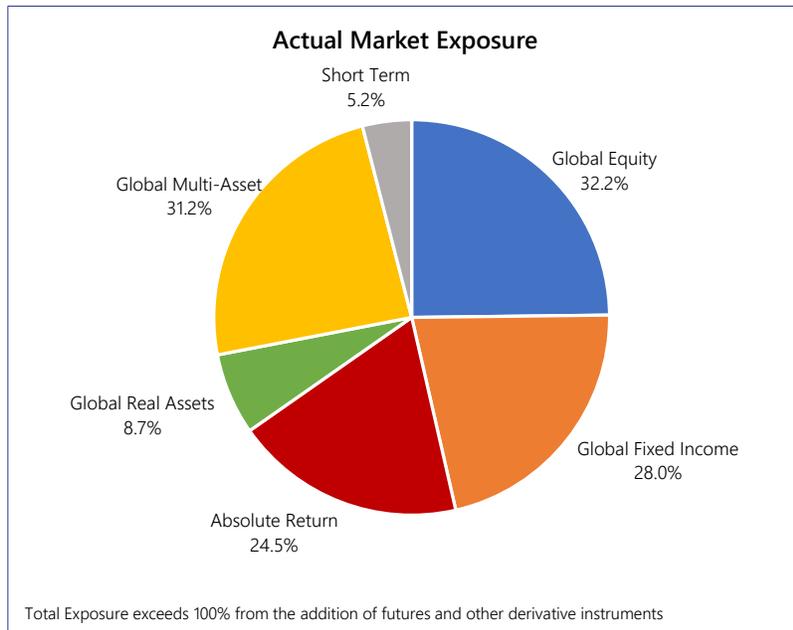
The pie chart below details the target asset mix, consistent with the achievement of the long-term objectives of the System, as of June 30, 2018.



**Actual Asset Allocation as of June 30, 2018**

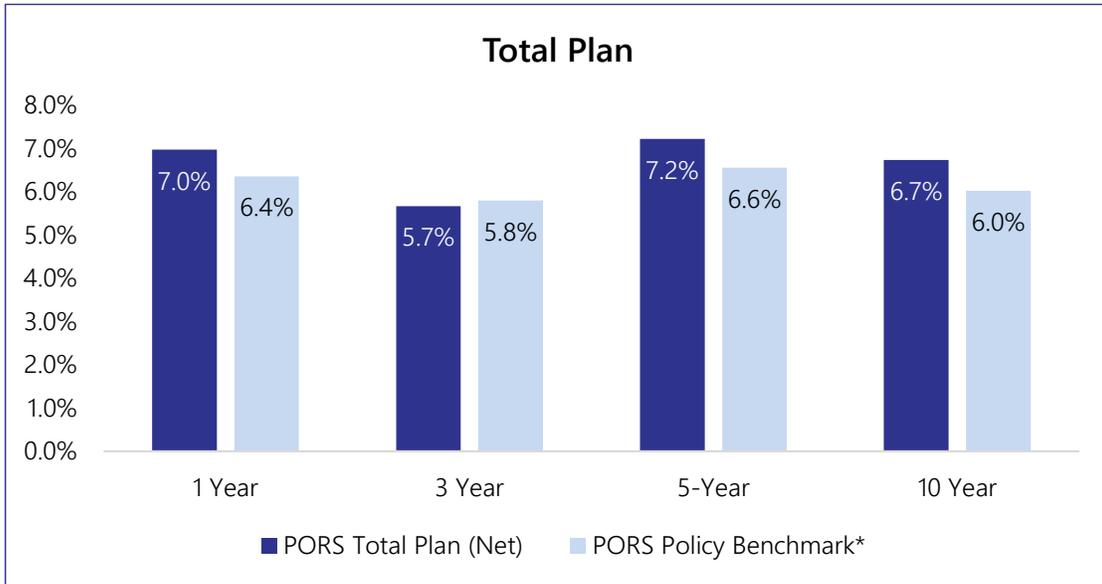
The asset structure of the Police Officers Retirement System has historically reflected a proper balance of the System’s needs for liquidity, growth of assets, and risk tolerance. The System’s investment policy is designed to continue to meet its long-term investment objectives while, at the same time, providing sufficient flexibility to meet short-term funding requirements.

The pie chart below details the target asset mix, consistent with the achievement of the long-term objectives of the System, as of June 30, 2018.

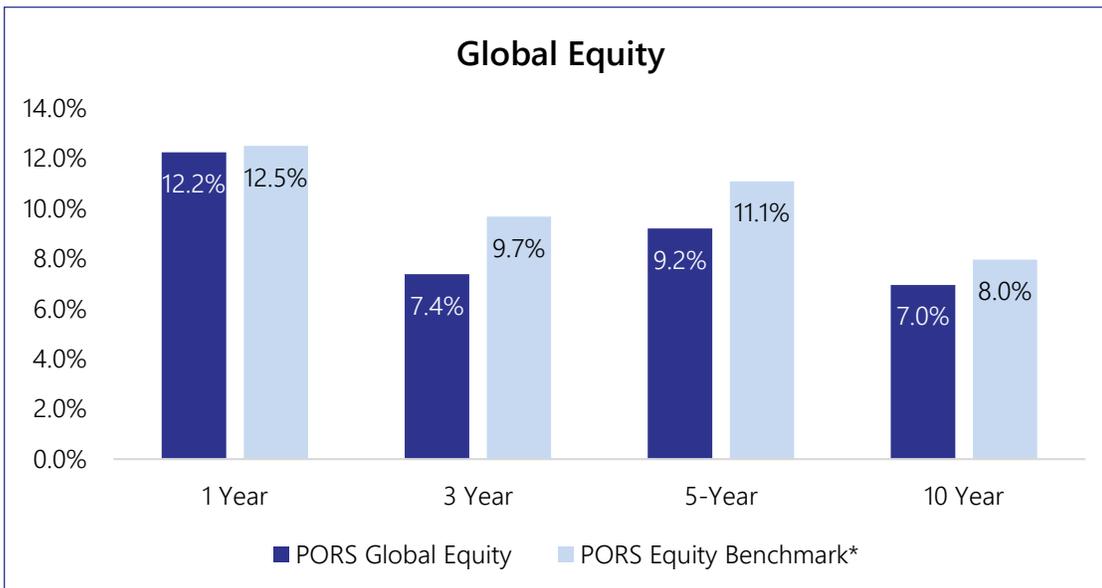


**Investment Results**

(Time weighted return, net of fees)

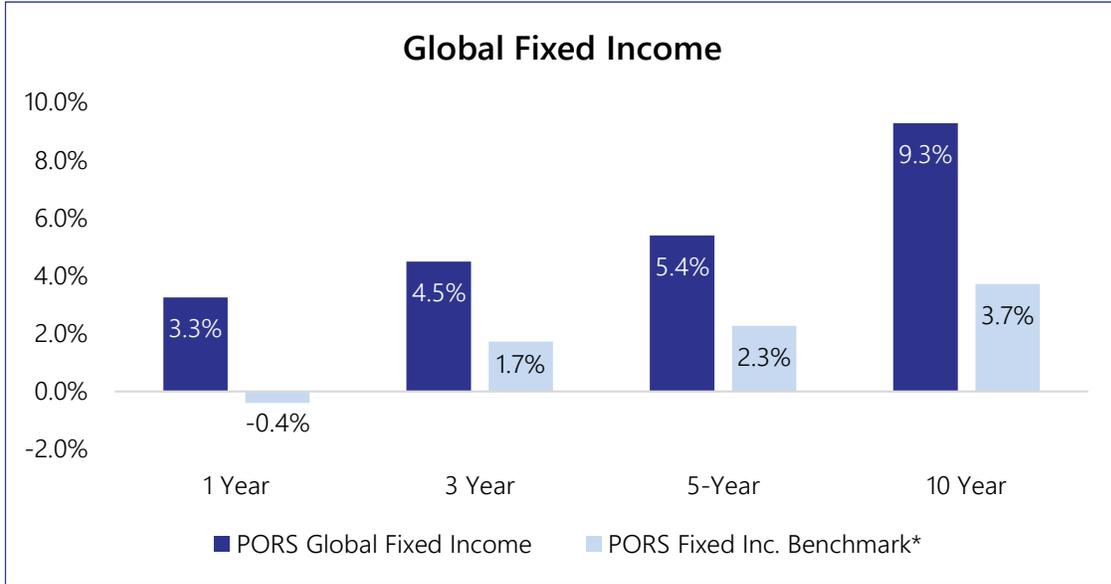


\*Current Benchmark: 30% Global Multi-Asset blended benchmark, 12% S&P 500, 5% Russell 2000, 9.5% MSCI EAFE, 2.5% MSCI Emerging Markets, 25% Barclays U.S. Aggregate Bond Index, 5% Merrill Lynch High Yield Master, 8% Real Assets blended benchmark, 3% Libor +3. (Benchmark has been revised through time)

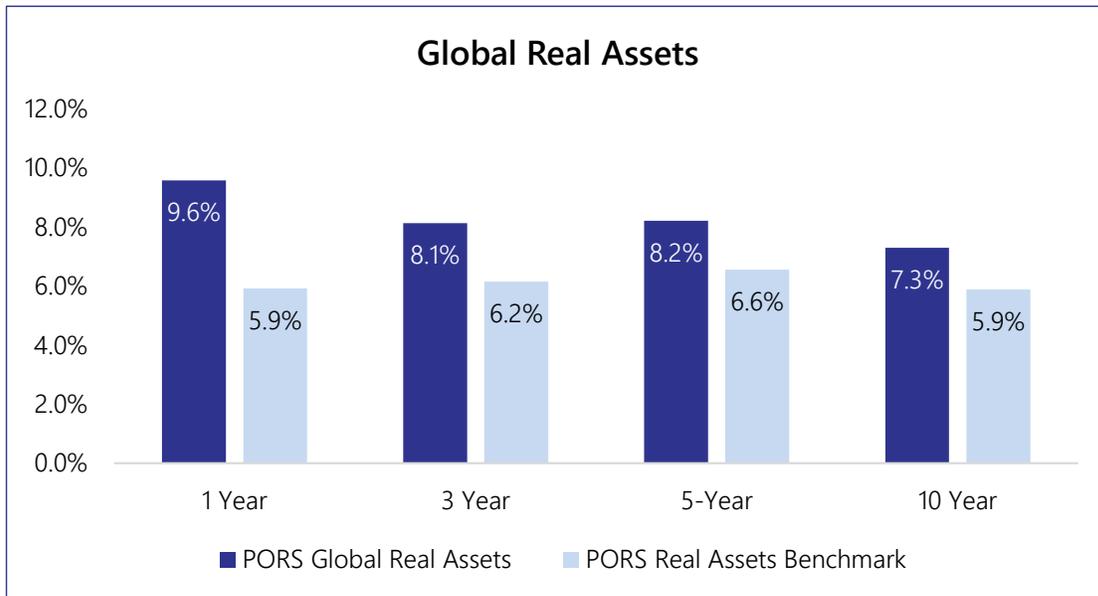


\*Current Benchmark: 41% S&P 500, 33% MSCI EAFE, 17% Russell 2000, 9% EM (Benchmark has been revised through time)

**Investment Results**  
(Time weighted return, net of fees)



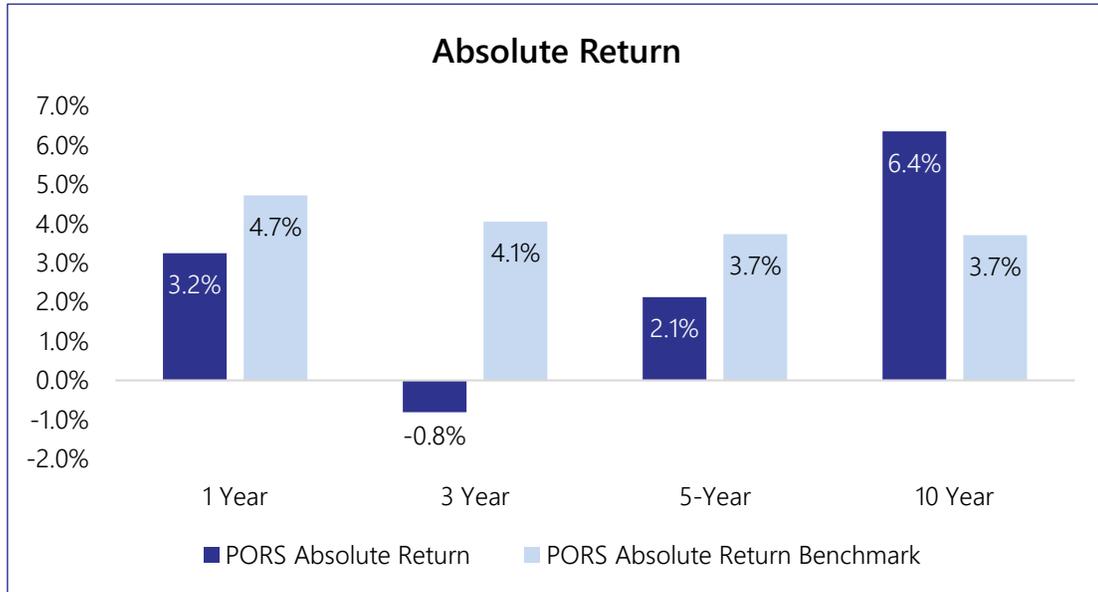
\*Current Benchmark: 83% Barclays U.S. Agg Bond Index, 17% Merrill Lynch High Yield Master (Benchmark has been revised through time)



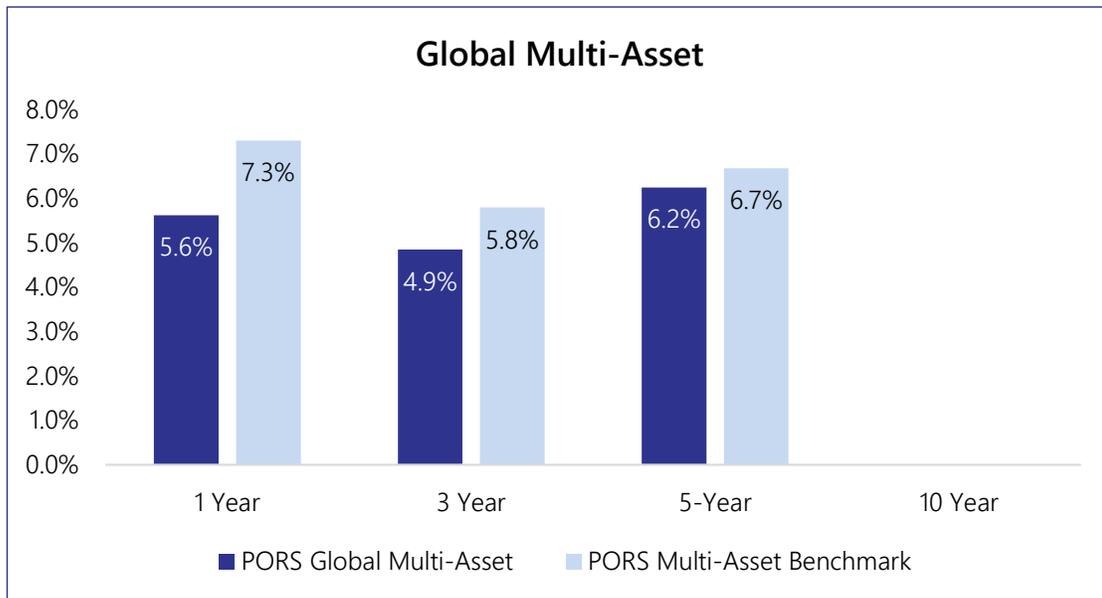
\*Current Benchmark: 33.3% FTSE/NAREIT Developed, 33.3% DJ Brookfield Global Infrastructure, 33.3% Bloomberg Commodity (Benchmark has been revised through time)

### Investment Results

(Time weighted return, net of fees)



\*Current Benchmark: Libor + 3% (Benchmark has been revised through time)



\*Current Benchmark: 25% MSCI AC World Index (Local Currency Gross), 75% Barclays Global Treasury 7-10 Year Index (Hedged), 75% Barclays World Government Inflation Linked Bond Index (Hedged), 25% Bloomberg Commodity Index, -100% LIBOR 3 Month Return (Benchmark has been revised through time)

## Schedule of Ten Largest Equity &amp; Fixed Income Holdings

Ten Largest Equity Holdings*				
No. Shares	Description	Cost	Fair Value	% of Total Portfolio
18,110	CSL Ltd	\$1,303,116	\$2,577,366	0.18%
14,566	Accenture Plc	1,681,556	2,382,852	0.17%
4,100	Keyence Corp	989,164	2,315,677	0.16%
88,335	Experian Plc	1,525,563	2,186,122	0.15%
6,485	Lvmh Moet Hennessy Louis Vuitt	1,112,715	2,159,409	0.15%
11,630	Canadian Pacific Railway Ltd	1,440,842	2,128,523	0.15%
19,500	HDFC Bank Ltd	1,102,549	2,047,890	0.14%
230,200	AIA Group Ltd	1,516,046	2,012,851	0.14%
13,260	Shopify Inc	1,645,988	1,934,501	0.13%
89,302	Compass Group Plc	1,618,489	1,908,227	0.13%
	<b>Total</b>	<b>\$13,936,028</b>	<b>\$21,653,418</b>	<b>1.50%</b>

\*Full disclosure of holdings is available upon request.

Ten Largest Fixed Income Holdings*				
Par Value (in local values)	Description	Cost (in U.S. Dollars)	Fair Value (in U.S. Dollars)	% of Total Portfolio
11,791,247	U.S. Treas-CPI Inflation Index, 2.375%, 01/15/2027	\$13,415,915	\$13,411,718	0.93%
9,882,258	U.S. Treas-CPI Inflation Index, 0.125%, 04/15/2020	9,888,721	9,776,913	0.68%
7,590,907	U.S. Treas-CPI Inflation Index, 1.375%, 02/15/2044	8,467,512	8,473,501	0.59%
7,377,470	U.S. Treas-CPI Inflation Index, 0.625%, 04/15/2023	7,364,287	7,363,822	0.51%
7,496,765	U.S.Treas-CPI Inflation Index, 0.250%, 01/15/2025	7,287,362	7,291,429	0.51%
2,075,497	U.S.Treas-CPI Inflation Index, 3.875%, 04/15/2029	2,826,037	2,736,294	0.19%
5,000,000	Puerto Rico Cmwltth, 8.000%, 07/01/2035	3,841,375	2,025,000	0.14%
2,279,062	FHLMC Multiclass Mtg, Var Rt, 07/15/2043	1,769,122	1,873,526	0.13%
1,845,802	Harborview Mortgage Loan, Var Rt, 07/19/2047	1,783,230	1,764,310	0.12%
1,715,493	FNMA Gtd Remic, 4.000%, 01/25/2041	1,426,415	1,721,069	0.12%
	<b>Total</b>	<b>\$58,069,976</b>	<b>\$56,437,582</b>	<b>3.93%</b>

\*Full disclosure of holdings is available upon request.

## Schedule of Brokerage Commissions

For Year Ended June 30, 2018

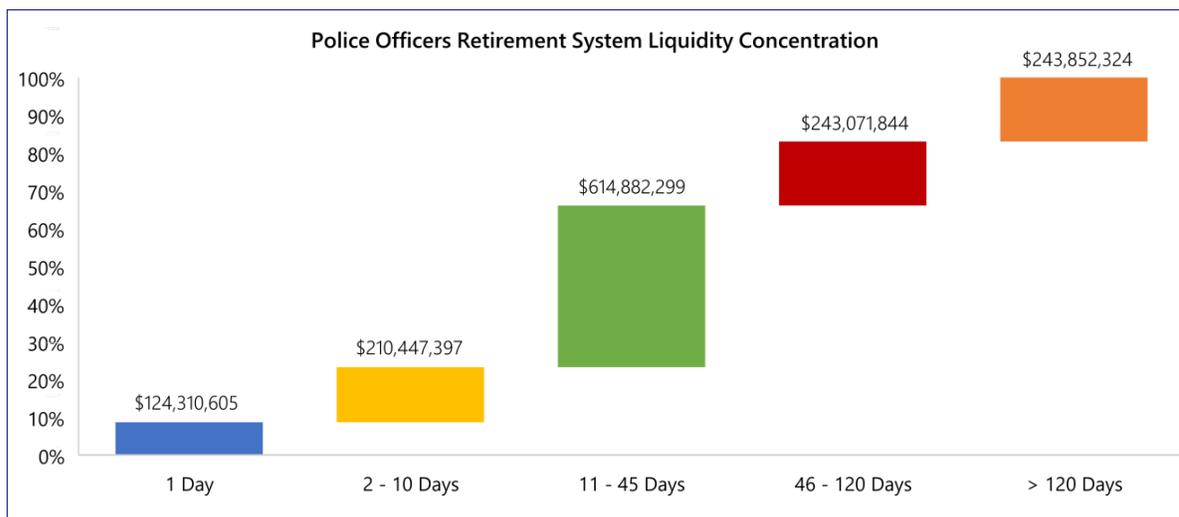
Broker Name	Base Volume	Total Shares	Base Commission	Commission Percentage
Goldman Sachs Do Brasil, Sao Paulo	\$560,351	4,295	\$870	0.16%
Credit Lyonnais Secs (Asia), Hong Kong	841,494	62,219	1,236	0.15%
Abg Secs, Oslo	9,030,833	145,748	12,139	0.13%
Credit Lyonnais Sec, Seoul	852,572	133,517	1,137	0.13%
Abg Sec As (Norge), Filial, Stockholm	42,778,777	186,524	56,798	0.13%
Bloomberg Tradebook, New York	2,318,828	226,827	3,040	0.13%
Goldman Sachs Intl, London	556,573	2,462	700	0.13%
Bnp Paribas Sec Svcs, London	1,906,734	205,062	2,394	0.13%
Berenberg Gossler & Cie, Hamburg	2,481,846	83,886	3,116	0.13%
Fidelity Clearing Canada Ulc, Tor	584,659	82,050	726	0.12%
Clsa Australia Pty Ltd, Sydney	1,029,961	16,001	1,250	0.12%
Citigroup Global Markets Ltd, London	1,171,747	4,905	1,420	0.12%
Barclays Capital, London	3,324,057	86,989	3,992	0.12%
Citibank, Ny	1,206,191	5,690	1,437	0.12%
Daiwa Secs Amer Inc, New York	691,186	6,958	806	0.12%
Cod00000062	955,468	75,603	1,104	0.12%
Cantor Fitzgerald & Co Inc, New York	1,735,458	61,929	1,928	0.11%
Barclays Capital Le, New York	4,326,295	288,546	4,717	0.11%
Citigroup Gbl Mkts Inc, New York	1,198,191	207,361	1,303	0.11%
Credit Suisse, New York	823,765	42,408	893	0.11%
Credit Suisse, Sao Paulo	797,448	167,883	811	0.10%
Daiwa Sec, Seoul	748,086	26,632	756	0.10%
Cantor Fitzgerald Europe, London	1,675,367	396,502	1,669	0.10%
Bradesco S.A. Ctm, Sao Paulo	1,880,917	38,549	1,845	0.10%
Bernstein Sanford C & Co, New York	2,457,498	163,622	2,410	0.10%
Cibc World Markets Corp, New York	1,663,696	283,916	1,479	0.09%
Bmo Capital Markets Corp, New York	2,148,253	110,990	1,862	0.09%
Barclays Capital Inc, New York	4,677,489	229,901	3,926	0.08%
Citibank Ltd, Melbourne	1,305,013	41,172	1,072	0.08%
Green Street Advisors (UK) Ltd, London	551,485	12,787	420	0.08%
D Carnegie Ab, Stockholm	780,616	89,337	556	0.07%
Credit Lyonnais Secs, Singapore	829,843	42,518	581	0.07%
Citigroup Gbl Mkts/Salomon, New York	1,174,341	45,200	817	0.07%
Exane, Paris	588,888	21,485	408	0.07%
Credit Suisse (Europe), London	823,912	24,742	570	0.07%
Barclays Capital Inc./Le, New Jersey	4,734,750	274,673	3,075	0.06%
Barclays Capital, New York	3,242,219	106,414	1,898	0.06%
Cibc World Mkts Inc, Toronto	1,427,382	41,060	813	0.06%
Banque Paribas, Paris	5,079,684	131,745	2,751	0.05%
Deutsche Morgan Grenfell Sec, Sydney	635,459	36,804	341	0.05%
Bloomberg Tradebook Llc, Ny	2,394,487	63,810	1,256	0.05%
Deutsche Bk Secs Inc, Ny	665,971	11,178	335	0.05%
Convergex Execution Solution, New York	890,559	69,667	371	0.04%
Banco Itau, Sao Paulo	5,537,366	213,299	2,227	0.04%
Bnp Paribas Secs Svcs, Sydney	1,890,423	95,000	756	0.04%
Bnp Paribas Sec Svcs Sa, Singapore	1,923,843	155,884	736	0.04%
Cowen and Co Llc, New York	864,921	19,687	312	0.04%
Citigroup Global Markets U.K., London	1,155,964	19,517	410	0.04%
Baird, Robert W & Co Inc, Milwaukee	6,777,197	88,740	1,331	0.02%
Goldman Sachs & Co, Ny	574,813	20,994	84	0.01%
Other Brokers	10,437,102	1,039,602	10,217	0.10%
<b>Total</b>	<b>\$148,709,978</b>	<b>6,012,290</b>	<b>\$147,101</b>	<b>0.10%</b>

Schedule of Management Fees by Asset Class		
For Year Ended June 30, 2018		
Asset Class	Fair Value	Management Fees
Absolute Return	\$207,802,315	\$3,698,604
Global Equity	324,344,673	3,165,618
Global Fixed Income	335,990,496	3,814,049
Global Multi-Asset	369,026,394	4,343,661
Global Real Assets	124,422,595	1,039,072
Short Term	74,977,996	120,470
<b>Total</b>	<b>\$1,436,564,469</b>	<b>\$16,181,474</b>

Investment Summary				
(Based on Capital Allocation)				
	As of June 30, 2017		As of June 30, 2018	
	Fair Value	% Fair Value	Fair Value	% Fair Value
Absolute Return	\$186,036,675	13.62%	\$207,802,315	14.47%
Global Equity	299,444,929	21.92%	324,344,673	22.57%
Global Fixed Income	310,082,074	22.70%	335,990,496	23.39%
Global Multi-Asset	363,296,757	26.60%	369,026,394	25.69%
Global Real Assets	110,759,545	8.11%	124,422,595	8.66%
Short Term	96,374,574	7.05%	74,977,996	5.22%
<b>Total</b>	<b>\$1,365,994,554</b>	<b>100.00%</b>	<b>\$1,436,564,469</b>	<b>100.00%</b>

**Liquidity Snap Shot on June 30, 2018**

The below liquidity chart for the Police Officers Retirement System demonstrates how the pension fund’s capital has been allocated to ensure sufficient liquidity to support short term uses of cash, such as retirement distributions, capital calls, potential daily margin calls and coverage ratio requirements on derivative notional balances. It details the liquidity concentration of the System’s total capital allocated to investments by their redemption schedule (monthly, quarterly, annually or none), including the number of calendar days’ notice that must be provided before the redemption of funds can be made.



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Classic Values, Innovative Advice.

October 15, 2018

Fairfax County Police Officers  
Retirement System  
12015 Lee Jackson Memorial Hwy, Suite 350  
Fairfax, Virginia 22033

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Fairfax County Police Officers Retirement System as of June 30, 2018. The full results and analysis of that annual valuation will be presented in a full actuarial valuation report. The purpose of this actuarial section is to provide key information from that report and support the disclosure of Total Pension Liability that is presented in the Financial Section of this CAFR. For a more complete analysis, please see the full report.

#### ***Funding Objective***

The funding objective of the System is to establish contribution rates that will remain level as a percentage of payroll over time. In order to achieve a more stable contribution rate, the County implemented a corridor funding method on July 1, 2002 (based on the July 1, 2001 valuation results). Under this approach, the current contribution rate is based on the normal cost rate and expense rate developed in the current valuation combined with an unfunded actuarial liability rate (UAL rate) based on assumption and plan changes since July 1, 2001 and a 15-year amortization of any amount by which the System's funded ratio is outside the corridor. The County is taking steps to increase the bottom of the corridor from the originally established 90% up to 100% by 2020. The Fiscal Year (FY) 2018 contribution was developed in the 2016 valuation report and was based on a corridor level of 98%.

#### ***Assumptions***

The actuarial assumptions used in performing the June 30, 2018 valuation were recommended by the actuary and adopted by the Board of Trustees based on our most recent review of the System's experience for the five-year period ending June 30, 2015. The assumptions and methods used for funding purposes were developed in compliance with the actuarial standards of practice as they relate to pension plans. The assumptions reflect our understanding of the likely future experience of the System and the assumptions both individually and as a whole 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 underlying assumptions, the results would vary accordingly.

#### ***Reliance on Others***

In preparing our valuation, we relied on information (some oral and some written) supplied by the 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.

#### ***Supporting Schedules***

As a part of the 2018 actuarial valuation, Cheiron prepared the Analysis of Financial Experience, Schedule of Retirees and Beneficiaries Added to and Removed from the Rolls and Solvency Test provided in this Actuarial Section.

We are also responsible for the disclosures of Net Pension Liability and its components in the Financial Section. The information provided in Note 4 of the Financial Section comes from the Actuarial Valuation as of June 30, 2018.

**Compliance with Code of Virginia §51.1-800**

Code of Virginia §51.1-800 requires that the benefits provided to a retiree at age 65 from a local retirement system equal or exceed two-thirds of the allowance to which the employee would be entitled under the provisions of the Virginia Retirement System (VRS).

Although there is no formal procedure for making this comparison, we compared the least valuable rate under the Police Officers Retirement System to the most valuable accrual rate under the VRS, making adjustments for the fact that employee contributions are required in excess of the VRS 5% rate. We found that the employer-provided accrual rates do exceed two-thirds of the most valuable employer-provided accrual rates under the VRS plan.

We certify that, to the best of our knowledge and understanding, the Fairfax County Police Officers Retirement System satisfies the requirements of the Code of Virginia §51.1-800.

**Certification**

To the best of our knowledge, this section and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards 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 section. This section does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

This section was prepared for the Fairfax County Police Officers Retirement System for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. Other users of this section are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,  
Cheiron



Fiona E. Liston, FSA  
Principal Consulting Actuary



Coralie A. Taylor, FSA  
Associate Actuary



### **Summary of Valuation Results**

The Actuarially Determined Contribution rate for Fiscal Year (FY) 2018 was developed in the 2016 valuation report and was based on a corridor floor of 98%. For more information on the Corridor method please see the Funding Method section of this report.

Amounts disclosed in Note 4 of the Financial Section were developed in conjunction with the 2018 valuation.

### **Summary of Actuarial Assumptions and Methods**

#### **Funding Method**

The entry age normal funding method is used to determine costs. Under this method, the County 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 future benefits that will not be paid by future County 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 County'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 ratio remains within a corridor of 90% to 120%. If the funded ratio falls outside this 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. Once the funded ratio is within the corridor, the contribution rate will return to the normal cost rate plus amortization of

post-2001 changes plus expense rate. The County is taking steps to increase the bottom of the corridor from the originally established 90% up to 100% by 2020. The Fiscal Year (FY) 2018 contribution was based on a corridor level of 98%.

#### **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.

#### **Changes since Last Valuation**

None

**Long Term Assumptions Used to Determine System Costs and Liabilities**

**Demographic Assumptions  
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

*Post-retirement mortality shown*

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.

20% of pre-retirement deaths are assumed to be service-connected.

**Disabled Mortality**

Annual Deaths Per 1,000 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.

**Termination of Employment**  
(Prior to Normal Retirement Eligibility)

Annual Terminations Per 1,000 Members	
Years of Service	Terminations
0	70
1	50
2	40
3	33
4	28
5	23
6	20
7	15
8	14
9	11
10	8
11	7
12	6
13	6
14	5
15	5
16	4
17	4
18	3
19	3
20	2
21	2
22	1
23	1
24	1
25 or more	0

It is assumed that members who terminated before normal or early retirement age elect to receive a refund of contributions instead of vested benefits.

**Disability**

Annual Disabilities Per 1,000 Members*	
Age	Male and Female
20	1
25	1
30	1
35	1
40	2
45	3
50	5
55	8
60	8

\*70% of disabilities are assumed to be service-connected. Of these, 100% are assumed to receive Workers' Compensation benefits.

**Retirement/DROP**

Years of Service	Retirement/DROP*
5-24	5%
25	40
26	40
27	40
28	40
29	40
30	40
31	40
32	40
33	40
34	40
35+	100

\*70% of those who leave under this decrement are assumed to DROP, with the other 30% taking immediate retirement.

**Merit/Seniority Salary Increase**  
(in addition to across-the-board increase)

<b>Years of Service</b>	<b>Merit/Seniority Increase*</b>
0	7.00%
1	6
2	5
3	4
4	3
5	2
6+	1

**Changes since Last Valuation**

None

**Family Composition**

For purposes of valuing the pre-retirement death benefit, an assumption concerning how many employees are married is needed. The assumption used in this valuation is that 80% of active employees are married at death and that the female spouse is five years-younger than the male spouse. In addition, each married employee is assumed to have two children, 22 and 24 years younger than the employee.

**Sick Leave Credit**

The unused sick leave balance as reported for each active member is used as of the valuation date. Future sick leave accruals for those hired before 2012 are assumed to accrue at 100% of each participant's annual average, but capped at 124 hours per year.

**Economic Assumptions**

Investment Return:	7.25% compounded per annum.
Rate of General Wage Increase:	2.75% compounded per annum.
Rate of Increase in Cost-of-Living:	2.50% compounded per annum.*
Total Payroll Increase (For amortization):	2.75% compounded per annum.
Administrative Expenses:	0.40% of payroll.

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

**Analysis of Financial Experience**  
**Gain and Loss in Accrued Liability during Years Ended June 30<sup>1</sup>**  
**Resulting from Differences between Assumed Experience and Actual Experience**

Type of Activity	Investment Income	Combined Liability Experience	Gain (or Loss) During Year from Financial Experience	Non-Recurring Items	Composite Gain (or Loss) During Year
2012	(\$8,996,470)	\$1,919,058	\$7,077,412	\$ -	(\$7,077,412)
2013	523,678	17,282,544	17,806,222	-	17,806,222
2014	31,937,393	11,575,441	43,512,834	(3,202,649)	40,310,185
2015	(4,528,707)	19,857,201	15,328,494	-	15,328,494
2016	(31,414,324)	10,963,818	(20,450,506)	(9,895,400)	(30,345,906)
2017	(14,213,085)	(11,638,382)	(25,851,467)	-	(25,851,467)
2018	(11,506,421)	(1,315,247)	(12,821,668)	-	(12,821,668)

<sup>1</sup> Schedule comes from the Actuarial Valuation as of June 30, 2018.

**Schedule of Retirees and Beneficiaries**  
**Added To and Removed From Rolls<sup>2</sup>**

Year Ended June 30	Added to Rolls		Removed From Rolls		On Rolls @ Yr. End		% Increase Allowance	Average Allowance
	No.	Annual Allowance	No.	Annual Allowance	No.	Annual Allowance		
2009	36	\$2,347,460	5	\$214,258	788	\$41,927,564	5.36%	\$53,208
2010	48	3,725,159	12	574,000	824	45,078,724	7.52%	54,707
2011	34	3,623,899	8	306,852	850	48,395,771	7.36%	56,936
2012	37	3,304,118	11	433,632	876	51,266,257	5.93%	58,523
2013	51	3,747,038	20	820,110	907	54,193,185	5.71%	59,750
2014	71	5,441,901	12	671,616	966	58,963,469	8.80%	61,039
2015	62	4,149,523	16	534,130	1,012	62,578,862	6.15%	61,837
2016	35	1,828,843	8	288,260	1,039	64,119,445	2.46%	61,713
2017	55	3,992,713	12	600,334	1,082	67,511,824	5.29%	62,395
2018	51	4,209,384	14	756,560	1,119	70,694,648	5.11%	63,418

<sup>2</sup> Prior to 2016, amounts are based on June 30 benefits adjusted for known COLA effective July 1. Post-2015, amounts reported are based on benefits on December 31 prior to the valuation date.

Solvency Test<sup>1</sup>

Aggregate Accrued Liabilities For							
Valuation Date June 30	(1) Active Member Contributions	(2) Retirees, Vested Terms, Beneficiaries & DROP	(3) Active Members (County Financed Portion)	Reported Assets	(1)	(2)	(3)
					Portion of Accrued Liabilities by Reported Assets		
2009	\$96,351,833	\$658,492,487	\$321,194,627	\$879,543,429	100%	100%	39%
2010	100,709,756	695,041,990	339,263,552	899,543,387	100%	100%	31%
2011	104,188,027	732,172,476	383,248,604	982,153,681	100%	100%	38%
2012	107,411,328	798,639,061	380,790,276	1,035,444,171	100%	100%	34%
2013	107,211,514	859,305,980	374,612,001	1,101,474,728	100%	100%	36%
2014	106,872,811	913,113,803	421,557,979	1,224,882,430	100%	100%	49%
2015	105,765,035	961,692,517	423,602,482	1,289,972,504	100%	100%	53%
2016	110,961,165	995,104,603	454,451,944	1,333,218,360	100%	100%	50%
2017	114,966,811	1,022,229,636	503,472,954	1,394,270,429	100%	100%	51%
2018	116,981,031	1,067,481,291	528,832,329	1,458,935,865	100%	100%	52%

<sup>1</sup>Schedule uses actuarial value of assets. Results would be different if market value of assets were used. Despite the name of this exhibit, the liabilities presented in this schedule are not an appropriate measurement of the settlement value of the System.

Schedule of Active Member Valuation Data

Valuation Date June 30	Number of Active Members <sup>2</sup>	Covered Payroll	Average Annual Salary	Percentage Increase in Average Pay
2009	1,347	99,912,937	74,174	
2010	1,312	100,689,672	76,745	3.47%
2011	1,293	100,251,171	77,534	1.03%
2012	1,276	101,121,159	79,249	2.21%
2013	1,237	97,361,728	78,708	-0.68%
2014	1,226	98,346,858	80,218	1.92%
2015	1,246	100,619,957	80,754	0.67%
2016	1,319	109,062,310	82,686	2.39%
2017	1,329	112,928,533	84,973	2.77%
2018	1,350	\$117,785,703	\$87,249	2.68%

<sup>2</sup>Excludes DROP participants.

## Schedule of Funding Progress

Valuation Date June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liabilities (b)	Unfunded Actuarial Accrued Liabilities (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)
2009	\$879,543,429	\$1,076,038,947	\$196,495,518	82%	\$99,646,822	197%
2010	899,543,387	1,135,015,298	235,471,911	79%	100,500,094	234%
2011	982,153,681	1,219,609,107	237,455,426	81%	99,070,327	240%
2012	1,035,444,171	1,286,840,665	251,396,494	80%	101,121,159	249%
2013	1,101,474,728	1,341,129,495	239,654,767	82%	97,361,728	246%
2014	1,224,882,430	1,441,544,593	216,662,163	85%	98,346,859	220%
2015	1,289,972,504	1,491,060,034	201,087,530	87%	100,619,957	200%
2016	1,333,218,360	1,560,517,712	227,299,352	85%	109,062,310	208%
2017	1,394,270,429	1,640,669,401	246,398,972	85%	112,928,533	218%
2018	1,458,935,865	1,713,294,651	254,358,786	85%	117,785,703	216%

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The Statistical Section presents historical information regarding the retirement plan. This information includes a ten-year analysis of the sources of change in plan net assets, benefit payments, the number of retired members and average monthly benefits. Sources of additions include employer and plan member contributions and net investment income; deductions include benefit payments to retirees and beneficiaries, refunds of employee contributions and administrative expenses. The amounts of benefits paid, the count of benefit recipients and the average benefit payments are provided by type of benefit, including service retirement annuities, service-connected and ordinary disability benefits and survivor benefits.

**Schedule of Additions by Source**

<b>Fiscal Year</b>	<b>Plan Member Contributions</b>	<b>Employer Contributions</b>	<b>Contributions % of Covered Payroll</b>	<b>Net Investment Income/ (Loss)</b>	<b>Total Additions</b>
2009	\$11,246,986	\$23,508,402	22.34%	(\$151,727,985)	(\$116,972,597)
2010	10,389,241	23,766,626	22.84%	143,107,767	177,263,634
2011	10,142,459	29,174,611	28.31%	210,054,206	249,371,276
2012	10,109,068	31,700,690	31.30%	(6,731,294)	35,078,464
2013	10,258,858	34,011,347	33.15%	96,783,078	141,053,283
2014	10,091,331	34,178,960	33.87%	176,683,610	220,953,901
2015	8,889,931	37,867,181	36.82%	41,601,153	88,358,265
2016	9,324,066	40,646,884	38.98%	10,764,028	60,734,978
2017	9,631,618	43,381,151	38.98%	116,099,350	169,112,119
2018	9,895,922	44,504,675	38.98%	94,134,740	148,535,337

**Schedule of Deductions by Type**

<b>Fiscal Year</b>	<b>Benefit Payments</b>	<b>Refunds of Contributions</b>	<b>Administrative Expenses</b>	<b>Total Deductions</b>
2009	\$43,467,322	\$761,803	\$337,334	\$44,566,459
2010	47,096,822	406,863	349,179	47,852,864
2011	49,429,119	466,363	362,889	50,258,371
2012	52,043,157	357,901	372,137	52,773,195
2013	55,266,464	300,847	415,119	55,982,430
2014	61,715,421	572,284	431,064	62,718,769
2015	67,276,713	480,447	443,230	68,200,390
2016	70,352,623	397,188	510,544	71,260,355
2017	72,534,389	641,609	481,574	73,657,572
2018	77,478,191	360,176	618,207	78,456,574

Schedule of Benefit Payments by Type

Fiscal Year	Service Annuity	Service-Connected Disability	Ordinary Disability	Survivor Benefit	Total
2009	\$39,708,613	\$1,241,328	\$90,442	\$2,426,939	\$43,467,322
2010	43,069,896	1,218,305	90,804	2,717,817	47,096,822
2011	45,302,801	1,173,023	109,018	2,844,277	49,429,119
2012	47,757,201	1,180,749	149,163	2,956,044	52,043,157
2013	50,784,313	1,212,826	147,739	3,121,586	55,266,464
2014	56,871,422	1,179,687	130,181	3,534,131	61,715,421
2015	62,221,104	1,182,810	134,897	3,737,902	67,276,713
2016	65,061,094	1,262,170	135,167	3,894,192	70,352,623
2017	67,080,670	1,148,156	136,519	4,169,044	72,534,389
2018	71,721,421	1,248,701	145,058	4,363,011	77,478,191

Schedule of Retired Members by Benefit Type

Fiscal Year	Service Annuity	Service-Connected Disability	Ordinary Disability	Survivor Benefit	Total
2009	660	30	6	92	788
2010	691	30	6	97	824
2011	716	30	7	97	850
2012	735	30	7	104	876
2013	764	30	6	107	907
2014	813	29	6	118	966
2015	862	29	6	115	1,012
2016	880	30	6	123	1,039
2017	915	30	6	131	1,082
2018	952	28	6	133	1,119

Schedule of Average Monthly Benefit Amounts

Fiscal Year	Service Annuity	Service-Connected Disability	Ordinary Disability	Survivor Benefit	Average
2009	\$4,805	\$3,439	\$1,261	\$2,301	\$4,434
2010	4,956	3,360	1,290	2,305	4,559
2011	5,154	3,284	1,776	2,392	4,745
2012	5,320	3,370	1,825	2,385	4,877
2013	5,427	3,334	1,844	2,418	4,979
2014	5,551	3,385	1,874	2,469	5,087
2015	5,592	3,236	1,877	2,515	5,153
2016	5,599	3,556	1,877	2,424	5,143
2017	5,664	3,350	1,896	2,493	5,200
2018	5,745	3,688	1,921	2,482	5,285

	Schedule of Average Benefit Payments						
	Years of Credited Service*						
	2-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30+
<b><u>Period 7/1/2007 to 6/30/2008</u></b>							
Average Monthly Benefit	\$ -	\$ -	\$2,178	\$3,084	\$4,964	\$5,043	\$5,388
Average of Final Monthly Salaries	\$ -	\$ -	\$5,725	\$5,696	\$7,390	\$6,770	\$5,959
Number of Retirees	-	-	1	1	11	13	1
<b><u>Period 7/1/2008 to 6/30/2009</u></b>							
Average Monthly Benefit	-	4,163	-	1,559	4,494	5,823	-
Average of Final Monthly Salaries	-	5,810	-	3,929	6,992	7,269	-
Number of Retirees	-	1	-	1	12	13	-
<b><u>Period 7/1/2009 to 6/30/2010</u></b>							
Average Monthly Benefit	-	-	3,069	-	4,278	5,307	-
Average of Final Monthly Salaries	-	-	5,936	-	7,866	7,182	-
Number of Retirees	-	-	2	-	4	32	-
<b><u>Period 7/1/2010 to 6/30/2011</u></b>							
Average Monthly Benefit	-	4,163	-	4,580	4,169	6,193	6,504
Average of Final Monthly Salaries	-	6,062	-	6,669	7,099	8,246	7,576
Number of Retirees	-	1	-	1	8	20	2
<b><u>Period 7/1/2011 to 6/30/2012</u></b>							
Average Monthly Benefit	-	600	-	-	4,565	5,800	-
Average of Final Monthly Salaries	-	3,711	-	-	7,437	7,661	-
Number of Retirees	-	1	-	-	4	17	-
<b><u>Period 7/1/2012 to 6/30/2013</u></b>							
Average Monthly Benefit	-	-	4,339	-	4,070	5,702	7,525
Average of Final Monthly Salaries	-	-	6,319	-	7,416	8,056	8,661
Number of Retirees	-	-	1	-	4	27	3
<b><u>Period 7/1/2013 to 6/30/2014</u></b>							
Average Monthly Benefit	-	-	-	3,147	4,041	5,795	6,965
Average of Final Monthly Salaries	-	-	-	6,728	7,192	8,016	,837
Number of Retirees	-	-	-	2	9	37	7
<b><u>Period 7/1/2014 to 6/30/2015</u></b>							
Average Monthly Benefit	-	997	3,202	3,758	4,059	5,624	8,047
Average of Final Monthly Salaries	-	5,519	6,235	6,925	7,507	7,840	8,698
Number of Retirees	-	1	2	2	3	32	5
<b><u>Period 7/1/2015 to 12/31/2015</u></b>							
Average Monthly Benefit	-	3,726	-	3,113	3,590	5,792	8,409
Average of Final Monthly Salaries	-	5,589	-	6,492	6,977	7,982	9,192
Number of Retirees	-	1	-	1	1	15	5
<b><u>Period 7/1/2016 to 12/31/2016</u></b>							
Average Monthly Benefit	-	967	3,416	2,999	3,876	5,739	6,814
Average of Final Monthly Salaries	-	6,031	6,565	6,478	7,386	7,976	7,628
Number of Retirees	-	1	2	1	5	33	3
<b><u>Period 7/1/2017 to 12/31/2017</u></b>							
Average Monthly Benefit	-	2,340	2,243	-	4,469	6,267	7,219
Average of Final Monthly Salaries	-	5,541	6,510	-	7,652	8,542	8,206
Number of Retirees	-	2	2	-	4	31	5

\* The Years of Credited Service is the service used in the determination of benefits, which may be different than service for eligibility.

Active Participants Count 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	43	53	-	-	-	-	-	-	96
25 to 29	30	142	28	2	-	-	-	-	202
30 to 34	8	63	49	80	1	-	-	-	201
35 to 39	2	19	18	99	77	2	-	-	217
40 to 44	-	6	15	41	144	50	-	-	256
45 to 49	-	5	2	20	86	96	30	4	243
50 to 54	-	-	2	17	23	32	24	5	103
55 to 59	-	1	2	5	4	4	6	3	25
60 to 64	-	1	-	1	-	1	1	2	6
65 & up	-	-	-	-	-	1	-	-	1
<b>Total</b>	<b>83</b>	<b>290</b>	<b>116</b>	<b>265</b>	<b>335</b>	<b>186</b>	<b>61</b>	<b>14</b>	<b>1,350</b>

Active Participants 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	\$2,412,543	\$3,223,066	\$-	\$-	\$-	\$-	\$-	\$-	\$5,635,609
25 to 29	1,757,333	9,333,590	1,968,580	145,841	-	-	-	-	13,205,344
30 to 34	453,800	4,511,612	3,685,677	6,613,788	79,341	-	-	-	15,344,218
35 to 39	150,813	1,369,597	1,358,331	8,328,945	6,727,480	193,355	-	-	18,128,521
40 to 44	-	432,014	1,145,111	3,425,288	13,032,460	4,985,304	-	-	23,020,177
45 to 49	-	374,933	154,154	1,685,490	7,602,225	9,647,953	3,440,397	442,637	23,347,789
50 to 54	-	-	156,487	1,442,986	2,040,874	3,076,750	2,624,395	565,215	9,906,707
55 to 59	-	83,488	163,530	406,875	342,240	418,383	595,316	377,354	2,387,186
60 to 64	-	80,392	-	83,273	-	83,101	91,160	381,168	719,094
65 & up	-	-	-	-	-	85,565	-	-	85,565
<b>Total</b>	<b>\$4,774,489</b>	<b>\$19,408,692</b>	<b>\$8,631,870</b>	<b>\$22,132,486</b>	<b>\$29,824,620</b>	<b>\$18,490,411</b>	<b>\$6,751,268</b>	<b>\$1,766,374</b>	<b>111,780,210</b>

### Retirees by Location

Retirees by State	
State	% of Total
VA	74.77%
FL	8.94%
NC	4.52%
SC	3.51%
MD	2.60%
TX	1.36%
GA	1.24%
PA	1.24%
WV	1.02%
TN	0.79%

Retirees Living in Fairfax County	
County	% of Total
Fairfax County	15.52%

Retirees by Fairfax County City	
City	% of Total
Centreville	3.85%
Fairfax	1.61%
Herndon	1.50%
Springfield	1.39%
Clifton	1.28%
Fairfax Station	0.96%
Lorton	0.86%
Alexandria	0.75%
Vienna	0.75%
Burke	0.54%
Chantilly	0.54%
Reston	0.43%
Falls Church	0.32%
Oakton	0.32%
Annandale	0.21%
Franconia	0.11%
Great Falls	0.11%

# POLICE Officers RETIREMENT SYSTEM

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