HPOPS

FOR TODAY & TOMORROW

LIFE CYCLE PLANNING

A Component Unit of

The City of Houston, Texas

Comprehensive Annual Financial Report

for the years ended June 30, 2018 and June 30, 2017

The mission of the Houston Police Officers' Pension System is to responsibly manage the System in the best interests of the members and beneficiaries so that they may have peace of mind knowing their pension benefits are secure.

HOUSTON POLICE OFFICERS' PENSION SYSTEM

HPOPS

FOR TODAY & TOMORROW

INTRODUCTORY SECTION

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Dwayne Ready
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Melissa Dubowski
CITY TREASURER

Don A. Sanders
MAYOR'S REPRESENTATIVE

EXECUTIVE DIRECTOR
John E. Lawson

Houston Police Officers' Pension System
602 Sawyer, Suite 300
Houston, Texas 77007
(713) 869-8734 phone
(713) 869-7657 fax
www.hpops.org

December 5, 2018

The Membership
Houston Police Officers' Pension System
Houston, Texas

The Comprehensive Annual Financial Report (CAFR) of the Houston Police Officers' Pension System (the System) for the fiscal year ended June 30, 2018 is submitted herewith. Responsibility for both the accuracy of the data, and the completeness and fairness of the presentation, rests with the management of the System. We trust that you will find this CAFR helpful in understanding your retirement system, a system that strives to provide responsible stewardship of assets contributed by the members and the City of Houston (the City). This CAFR is divided into five sections:

- Introductory Section – This section contains the administrative organization, the letter of transmittal and Chairman's report.
- Financial Section – This section contains the report of the Independent Auditor, Management's Discussion and Analysis, the financial statements of the System and certain required supplementary information.
- Investment Section – This section contains a report on investment activity, investment policies, investment results, and various investment schedules.
- Actuarial Section – This section contains the Actuary's Certification Letter and summary results of the annual actuarial valuation.
- Statistical Section – This section includes historical financial and benefits related data pertaining to the System.

The financial statements and related information included in the *Financial Section* of this report are the responsibility of the Board of Trustees and management of the System. The financial statements have been prepared in accordance with generally accepted accounting principles (GAAP) and presented in accordance with guidance provided by applicable statements issued by the Governmental Accounting Standards Board (GASB). The System's independent auditor, BDO, conducted an independent audit of the basic financial statements in accordance with U.S. generally accepted auditing standards. This audit is described in the *Independent Auditors' Report* found in the *Financial Section*. Management has provided the external auditors with full and unrestricted access to the System's staff to discuss their audit and related findings to facilitate independent validation of the integrity of the System's financial reporting.

The *Financial Section* also contains *Management's Discussion and Analysis*, which serves as an introduction to and an overview of the financial statements. The System is considered a component unit of the City of Houston for financial reporting purposes and, as such, the financial statements in this report are also included in the *City of Houston's Comprehensive Annual Financial Report*.

In developing and evaluating the System's accounting system, the adequacy of internal accounting controls is a primary concern. The System's controls are designed to provide reasonable assurance regarding the safekeeping of assets and the reliability of financial records. These controls include strategic design of the System's business and accounting systems, the appropriate segregation of duties and responsibilities, sound practices in the performance of those duties, capable personnel, and the structure of the organization. There are limits to internal control, such as the cost to mitigate some risks may outweigh the risk itself, internal controls may be overridden, or collusion may thwart control design. We believe the System's internal controls are adequate and are working as designed.

The System was established in 1947, funded by a $100,000 Treasury note, and offered retiring members a pension of $75 per month. Today, the System has investments of $5.5 billion and offers a variety of pension benefits to members and their beneficiaries. Members have the option to defer their benefits or retire under a regular service retirement. Members also may access a disability retirement, either duty or non-duty connected.

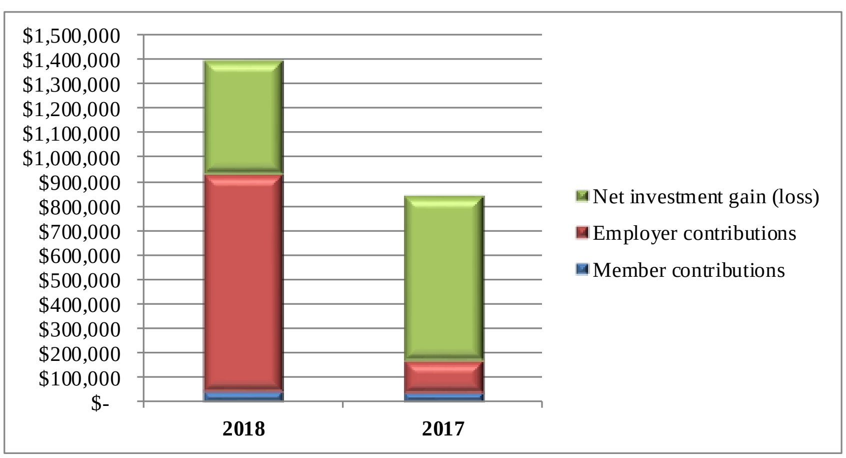
Additions to Plan Net Position

The System relies on the contributions of members and the City of Houston, as well as income generated from investments, to provide funds needed to finance retirement and disability benefits. Under the Governing Statute, the employer contribution rate is determined actuarially, based on a Risk Sharing Valuation Study (RSVS). The Governing Statute required a Final Risk Sharing Valuation Study (RSVS) as of June 30, 2016, which was completed September 25, 2017. For fiscal year 2018, the actual employer contribution rate equaled 31.77% of compensation, as established in the initial RSVS. For fiscal year 2019, the City's contribution is to be 31.85% of compensation. In addition to the actuarially determined contributions, the Governing Statute required the City to fund $750,000 thousand of the System's unfunded liability on or before December 31, 2017, through the issuance of pension obligation bonds (POB). The proceeds of these pension obligation bonds were received on December 22, 2017.

The number of active members increased in fiscal year 2018 compared to 2017 as the number of new hires to the Houston Police Department (HPD) outpaced retirements. Contributions from members increased in fiscal 2018 as the Governing Statute was amended to require all members to contribute 10.50% of pay. For fiscal year 2017, members hired prior to October 9, 2004 were required to contribute 9.00% of pay and members hired or rehired subsequent to October 9, 2004 were required to contribute 10.25% of pay. The System experienced a positive time-weighted investment return of 10.2% in 2018, as opposed to a positive return of 16.8% in 2017. This increase was mainly due to sustained global growth and growth in the U.S. markets based on favorable corporate earnings and enthusiasm over U.S. tax cuts.

Active members:	2018	2017	Increase (Decrease)
Fully vested	1,808	1,814	(6)
Nonvested:			
Hired or rehired before October 9, 2004	613	772	(159)
Hired or rehired after October 9, 2004	2,826	2,585	241
	5,247	5,171	76

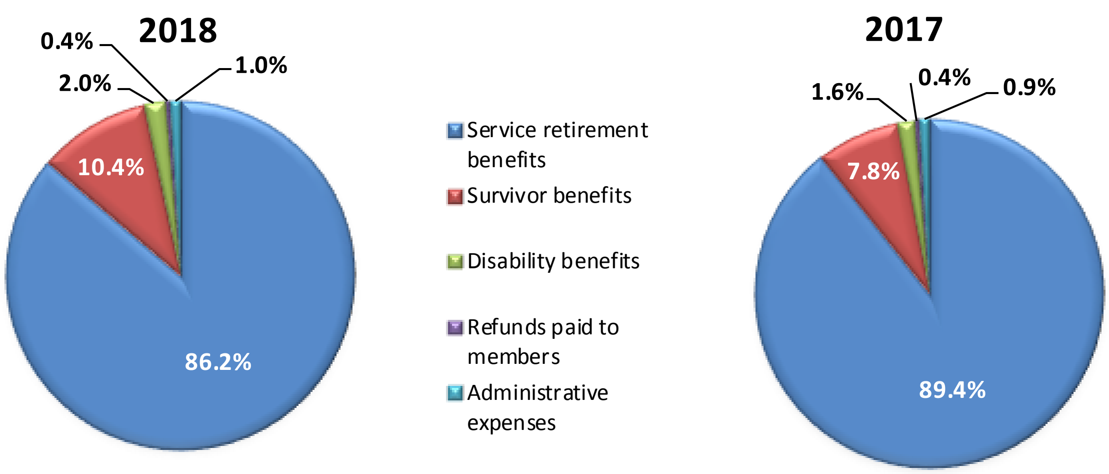
	$000's		Increase (Decrease)	Increase (Decrease)
	2018	2017	Amount	Percentage
Member contributions	$ 45,254	$ 40,104	$ 5,150	12.8%
Employer contributions	887,143	133,805	753,338	563.0%
Net investment gain (loss)	463,080	667,476	(204,396)	30.6%
Total	$ 1,395,477	$ 841,385	$ 554,092	65.9%



Deductions from Plan Net Position

The System was created to provide retirement benefits to retired Houston police officers and their dependents. Although this is still the primary purpose of the System, over the course of 71 years the System has also added survivor benefits and disability benefits. The cost of these programs includes benefit payments and refunds of contributions to terminated employees. The cost of administering the System is also paid from System assets.

	$000's		Increase (Decrease) Amount	Increase (Decrease) Percentage
	2018	2017		
Service retirement benefits	$ 315,624	$ 415,260	$ (99,636)	(24.0%)
Survivor benefits	38,081	36,031	2,050	5.7%
Disability benefits	7,328	7,442	(114)	(1.5%)
Refunds paid to members	1,329	1,696	(367)	(21.6%)
Administrative expenses	3,679	4,238	(559)	(13.2%)
Total	$ 366,041	$ 464,667	$ (98,626)	(21.2%)



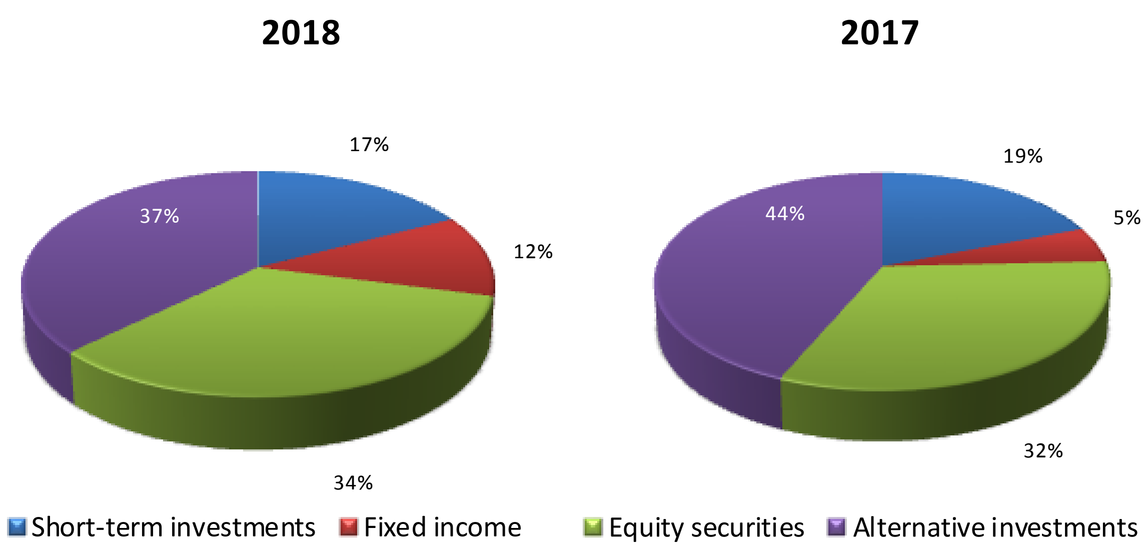
Total benefits paid, which include lump sum payments, decreased in 2018 as compared to 2017 due mainly to a decrease in lump sum benefits offset by cost of living increases and an increase in the number of retirees. Administrative expenses decreased mainly due to completion of negotiations with the City resulting in a decrease for actuarial services and the completion of enterprise system projects and maintenance. For further information regarding the System's financial condition, refer to Management's Discussion and Analysis in the Financial Section of this report.

Investments

The System invests funds entrusted to it exclusively for the benefit of its members. It avows an investment rule commonly known as the "prudent expert" rule, whereby from a procedural as well as substantive standpoint, it acts with the care, skill, prudence and diligence that a "prudent expert" acting in a similar capacity would act under similar circumstances.

The Board of Trustees believes that the System's assets should be managed in a way that reflects the uniqueness of the System, and that the System's assets should be diversified over a spectrum of investment vehicles. The determination of the appropriate asset mix is based on capital market assumptions that incorporate both historical and projected returns, volatility, liquidity and correlations of various asset classes.

	$000's		Increase (Decrease) Amount	Increase (Decrease) Percentage
	2018	2017		
Short-term investments	$ 942,332	$ 844,812	$ 97,520	11.5%
Fixed income	642,196	235,049	407,147	173.2%
Equity securities	1,841,327	1,435,775	405,552	28.2%
Alternative investments	2,026,412	1,939,049	87,363	4.5%
Total	$ 5,452,267	$ 4,454,685	$ 997,582	22.4%



Fiscal year 2018 continued the strong growth from the previous year fueled by positive corporate earnings, sustained global growth, and continued positive investor sentiment. Investor concerns about trade wars and faster inflation receded throughout the year, which combined with the passage of U.S. tax cuts helped stimulate the economy. All of this resulted in the System's investment return being a positive 10.2% for fiscal year 2018. The System outperformed its benchmark rate of return by 0.5%, primarily due to its allocation to US equities, both public and private. The System's domestic equity allocation returned 16.5%, outperforming its benchmark by 1.7% while the System's international equity allocation, returning 4.4%, underperformed its benchmark rate of return by 2.9%. The System's alternative investments in private equity returned 23.4% and outperformed its benchmark by 7.3% while the System's real estate allocation outperformed its benchmark by 5.7%.

The Board firmly believes that by maintaining a disciplined investment approach and with reasonable diversification, the System will enhance the likelihood of meeting its long-term investment goals. Further details regarding the System's investments are included in the Investment Section of this report.

Funding

It is the System's objective to have enough money in reserve to provide members with promised benefits upon their retirement. The System's actuary conducts a periodic valuation to determine the adequacy of the current employer contribution rates, to describe the current financial condition of the System, and to analyze changes in the System's condition. An actuarial accrued liability is the liability for service already rendered by former and present employees. An actuarial accrued surplus is the excess of the System's actuarial value of assets over the actuarial accrued liability. Any liability or surplus is amortized over 30 years from the valuation date.

The most recent actuarial valuation shows the funded position of the System increased slightly from 78.3% at July 1, 2017 to 79.3% at July 1, 2018. The actuarial accrued liability increased $245.6 million and the actuarial value of assets increased $260.2 million. As a result, the System's Unfunded Actuarial Accrued Liability decreased $14.6 million to $1,335.0 million as of July 1, 2018. The increase in the Unfunded Actuarial Accrued Liability is due to a combination of factors including the increase in the actuarial value of assets greater than assumed and receipt of $750 million of Pension Obligation bonds as more fully described in the footnotes and schedules to the financial statements. Further details regarding the System's actuarial liability are included in the Actuarial Section of this report.

Major Initiatives

The System continues to provide a high level of service to our members. The Financial Planning and Estate Planning services allow members to meet one on one with System professional staff to discuss financial issues and work to prepare different legal documents in order to protect the member's estate. These services are free of charge and continue to be highly valued by System members.

The Member Website continues to grow and provide members and survivors more information on their benefits and provide them a self-service for standard processes. The System continues to receive positive feedback and increased participation through the Member Website.

Professional Services

The Board of Trustees appoints professional consultants to perform services that are considered essential for the operation of the System. The independent auditor's report, issued by BDO USA, LLP, is included on page 17 of this report. The actuarial report, certified by Gabriel Roeder Smith & Company, is included on page 69. Professional service providers who provided services to the System during the year are listed below.

Actuarial	Gabriel Roeder Smith & Company	**Legal Service/Lobbyists**	HillCo Partners, LLC Locke Lord LLP
Auditing	BDO USA, LLP Bickley Prescott & Co.	**Money Management**	AQR Capital Management LLC BlackRock Institutional Trust Company Blackstone Alternative Solutions LLC Bridgewater Associates, Inc. The Northern Trust Company Parametric Shenkman Capital Management, Inc.
Consulting	Franklin Park Associates, LLC Mercer Investment Consulting Inc.		
Custodian	The Northern Trust Company		
Legal Service	Burford Perry LLP IceMiller LLP Kasowitz, Benson, Torres & Friedman LLP		

Certificate of Achievement

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to the Houston Police Officers' Pension System for its comprehensive annual financial report for the fiscal year ended June 30, 2017. This was the 24th consecutive year that the System has achieved this prestigious award. In order to be awarded a Certificate of Achievement, a government unit 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 comprehensive 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.

Acknowledgements

The compilation of this report reflects the combined effort of the System's staff under the guidance of the Board of Trustees. Its goal is to provide complete and reliable information as a basis for management decisions and compliance with legal provisions as well as responsible stewardship of funds contributed by its members and the City of Houston.

We would like to take this opportunity to express our gratitude to the staff, System advisors, and to the many other people who have contributed to the successful operation of the System.

Sincerely,

Board of Trustees

Board of Trustees

December 5, 2018

To the Members
Houston Police Officers' Pension System
Houston, Texas

PENSION BOARD
Terry A. Bratton
CHAIRMAN

George Guerrero
VICE CHAIRMAN

J. Larry Doss
SECRETARY

Michael J. Newsome
TRUSTEE

Dwayne Ready
TRUSTEE

Melissa Dubowski
CITY TREASURER

Don A. Sanders
MAYOR'S
REPRESENTATIVE

EXECUTIVE DIRECTOR
John E. Lawson

The Houston Police Officers' Pension System (HPOPS) is pleased to bring you the fiscal year 2018 Comprehensive Annual Financial Report (CAFR). The CAFR provides a comprehensive picture of HPOPS' finances for the fiscal year ending June 30, 2018, as well as an overview of the year's highlights.

This past year HPOPS has experienced both changes and strong growth leading to a healthier pension plan. During the year, the Texas legislature approved the pension reform bill negotiated by representatives of the employee retirement plans and the City of Houston. As a result, plan assets increased during the year as HPOPS received $750 million of pension obligation bond proceeds from the City of Houston.

Solid economic data in the U.S. and positive investor sentiment helped create strong global growth, with HPOPS experiencing a positive return of 10.2% and outperforming its benchmark rate of return by 0.5%. The year began with continued strong growth from the previous year in both the U.S. and global markets. Domestic markets were buoyed by strong corporate earnings and the passage of the Tax Cuts and Jobs Act of 2017. International markets fared well, but later in the year the prospect of trade wars and a stronger dollar created pressure that dampened growth. Taking into consideration the aging bull market and in order to protect against the event of a market correction, HPOPS increased our fixed income exposure during the year. HPOPS will continue to diligently maintain perspective with an ever vigilant eye on the opportunities and risks in the coming year.

The lessons learned over the past few years and our stewardship allow us to fulfill our mission to responsibly manage the System in the best interests of the members and beneficiaries so that they may have peace of mind knowing their pension benefits are secure. I wish to express appreciation to the staff and professional consultants who work so effectively to ensure the continued successful operation of HPOPS.

We at HPOPS continue to plan for the future of all of our current members as well as those members to come. We encourage you to read on to learn more about HPOPS.

Houston
Police Officers'
Pension System
602 Sawyer, Suite 300
Houston, Texas 77007
(713) 869-8734 phone
(713) 869-7657 fax
www.hpops.org

Sincerely,

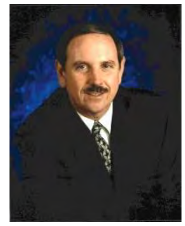
Terry A. Bratton
Chairman

BOARD OF TRUSTEES AND ADMINISTRATIVE STAFF

TRUSTEES ELECTED BY ACTIVE, INACTIVE AND RETIRED POLICE OFFICERS

TERRY BRATTON
Chairman

GEORGE GUERRERO
Vice-Chairman



J. LARRY DOSS
Secretary

DWAYNE READY
Trustee

MICHAEL J. NEWSOME
Trustee

TRUSTEES BY STATE STATUTE

MELISSA DUBOWSKI
City Treasurer

DON A. SANDERS
Mayor's Representative

POLICE PENSION OFFICE PERSONNEL

JOHN E. LAWSON
Executive Director

TIFFANY WILLIAMSON
Administrative Assistant

MICHELLE HARTSFIELD
Receptionist

CLARK OLINGER
Benefits Director

SHERYL BAINES
Benefits Specialist

REGINA WARD
Benefits Specialist

JUDY G. BAKER
Benefits Manager

BEVERLY LOCKETT
Benefits Specialist

RICHARD GABLE
Financial Planner

PATRICK S. FRANEY
Chief Investment Officer

STACEY GALO
Investment Analyst

NEAL WALLACH
Investment Analyst/Strategist

KEVIN T. O'TOOLE
Accounting Director

LAJUANA WINTERS
Accountant

ROXANNA OLIVER
Investments Accountant & Administrator

GREG SIMEON
IT Director

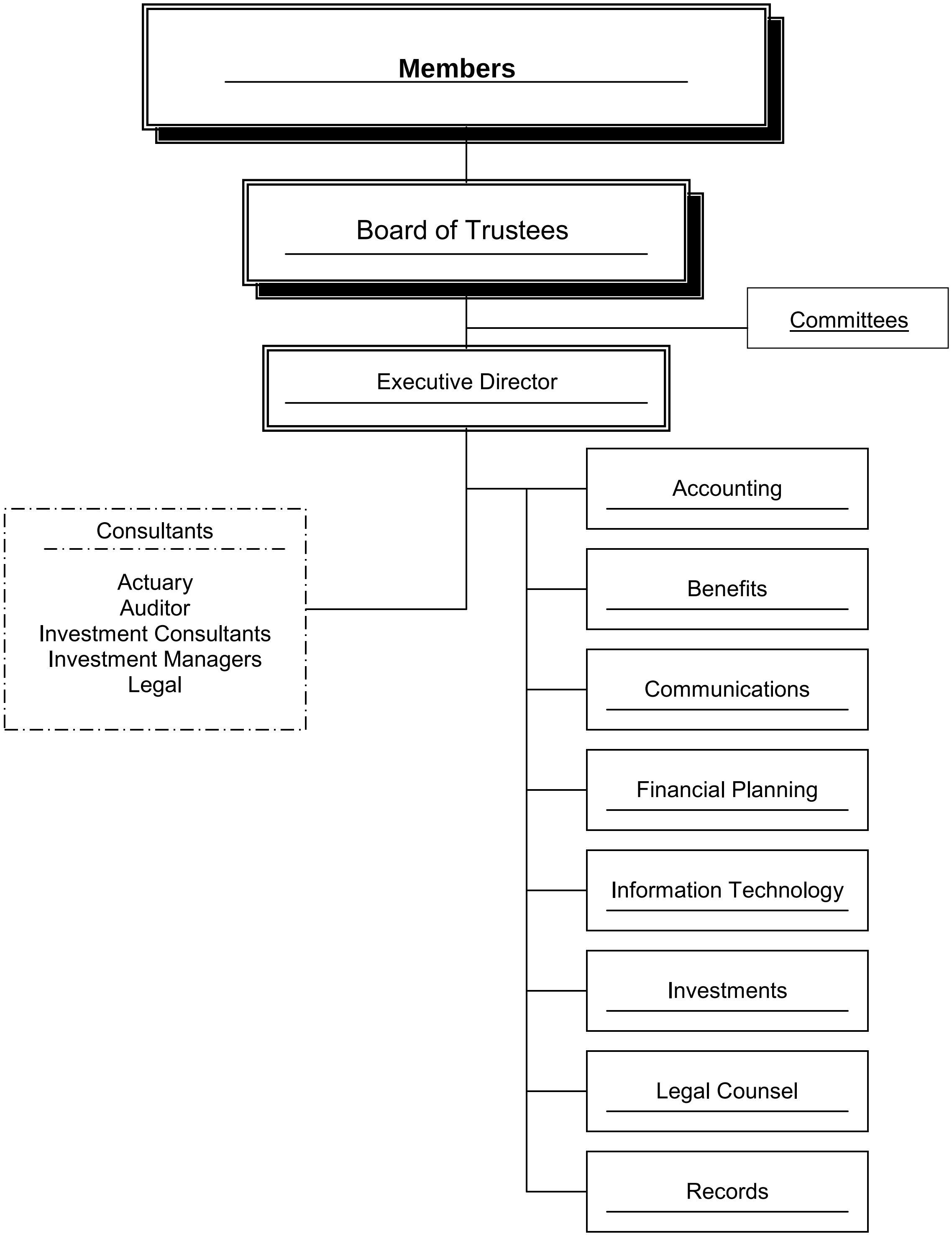
CHRISTOPHER SAUCEDA
IT Systems Administrator

STEPHANIE SEGURA
Records Manager

NICK DANG
General Counsel

CHRISTOPHER FLORES
Attorney

ORGANIZATION CHART



See Page 53 – Summary of Investment and Professional Services for a list of Consultants

Government Finance Officers Association

Certificate of Achievement for Excellence in Financial Reporting

Presented to

Police Officers Pension System

of the City of Houston, Texas

For its Comprehensive Annual
Financial Report
for the Fiscal Year Ended

June 30, 2017

Christopher P. Morrill

Executive Director/CEO

SECTION TWO

FINANCIAL SECTION

Tel: 713-960-1706
Fax: 713-960-9549
www.bdo.com

2929 Allen Parkway, 20th Floor
Houston, Texas 77019-7100

Independent Auditor's Report

The Board of Trustees
Houston Police Officers' Pension System
Houston, Texas

Report on the Financial Statements

We have audited the accompanying financial statements of Houston Police Officers' Pension System (the System), a component unit of the city of Houston, Texas, as of June 30, 2018 and 2017, and the related notes to the financial statements, which collectively comprise the System's basic financial statements as listed in the table of contests.

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 audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits 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 financial position of the System as of June 30, 2018 and 2017, and the changes in its financial position for the years then ended, in accordance with accounting principles generally accepted in the United States of America.

BDO USA, LLP, a New York limited liability partnership, is the U.S. member of BDO International Limited, a UK company limited by guarantee, and forms part of the international BDO network of independent member firms.

BDO is the brand name for the BDO network and for each of the BDO Member Firms.

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2929 Allen Parkway, 20th Floor
Houston, Texas 77019-7100

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that "Management's Discussion and Analysis" and the "Required Supplementary Information" listed on the Table of Contents 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 these 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 audits 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 audits were conducted for the purpose of forming an opinion on the basic financial statements as a whole. The accompanying supplemental schedules of "Investment, Professional and Administrative Expenses" and "Summary of Investments and Professional Services" are presented for the purpose of additional analysis and are not a required part of the basic financial statements. Such information is the responsibility of the System's management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. The information has been subjected to the auditing procedures applied in the audits 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 information is fairly stated in all material respects in relation to the basic financial statements as a whole.

BDO USA, LLP

Houston, Texas
October 9, 2018

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BDO is the brand name for the BDO network and for each of the BDO Member Firms.

The discussion and analysis of the financial performance of the Houston Police Officers' Pension System (the System), provides an overall review of the System's financial activities for the fiscal years ended June 30, 2018, 2017 and 2016. The intent of this discussion and analysis is to look at the System's financial performance as a whole; readers should review the financial statements, notes to the financial statements, required supplementary information and other schedules, in order to enhance their understanding of the System's financial performance.

Financial Statements

These financial statements consist of the Statements of Fiduciary Net Position, Statements of Changes in Fiduciary Net Position, Notes to Financial Statements, Schedules, and other unaudited required supplementary information. The System is a single employer contributory defined benefit pension plan. The System is a component unit of the City of Houston, Texas (the City) only to the extent the System receives contributions equal to a fixed amount or percentage of the pensionable pay of active members in accordance with Article 6243g-4, Vernon's Texas Civil Statutes (the Governing Statute), or contracts pursuant to Section 27 thereof, and as such, its reports are included in the Fiduciary Funds of the City as restricted assets.

Financial Highlights

The System presents its financial statements solely on the accounts of the System. The accrual basis of accounting is used by the System, whereby revenues are recognized when they are earned and collection is reasonably assured, and expenses are recognized when the liability has been incurred. Investments are reported at fair value.

A summary of the Statements of Fiduciary Net Position for the System is as follows ($000's):

As of June 30:	**2018**	2017	2016
Assets			
Investments at fair value	**$ 5,452,267**	$ 4,454,685	$ 4,040,927
Invested securities lending collateral	**109,070**	25,778	24,211
Receivables	**39,684**	5,997	41,949
Cash	**33**	104	304
Total Assets	**5,601,054**	4,486,564	4,107,391
Liabilities			
Due for purchase of investments	**3,502**	2,018	894
Securities lending collateral	**109,070**	25,778	24,211
Accrued investment and professional fees	**1,399**	1,127	1,172
Other liabilities	**469**	463	654
Total Liabilities	**114,440**	29,386	26,931
Net position restricted for pensions	**$ 5,486,614**	$ 4,457,178	$ 4,080,460

The System's net position increased by approximately $1,029,436 thousand in fiscal year 2018 over 2017 after an increase by approximately $376,718 thousand in fiscal year 2017 over 2016. The increase in fiscal year 2018 was attributable to the System receiving $750,000 thousand from the City through the issuance of pension obligation bonds (POB) in December, 2017, and investment returns. The markets in fiscal year 2018 continued the strong growth from the previous year with evidence of sustained global growth and better than expected economic data in the U.S. and positive corporate earnings through the fall despite increasing tensions with North Korea and a particularly destructive hurricane season. The second half of the year began strong as markets remained euphoric with improving global economic growth, favorable corporate earnings and enthusiasm over recent U.S. tax cuts. However, the remainder of the year saw market growth slow due to rising and falling concerns regarding fears of trade wars, faster inflation and higher interest rates. Fiscal year 2017 began strong with positive U.S. economic developments and less-negative-than-expected international news. The uncertainty of the U.S. presidential election slowed growth, but U.S. equity markets reached all-time highs after the election while international markets were driven by solid economic data. Positive investor sentiment fueled by improving U.S. economic data and decreasing political risk helped global markets perform in line with US markets for the first time since the financial crisis, which allowed the System to experience positive returns each month throughout the year.

The System experienced a positive time-weighted investment return of 10.2% in 2018 as opposed to a positive return of 16.8% in 2017 and a negative return of (3.1)% in 2016. These rates of return calculations were prepared using a time-weighted rate of return in accordance with The CFA Institute's Global Investment Performance Standards and, as such, cannot be recalculated from the information provided herein. Changes in receivables are primarily a result of the timing of investment transactions.

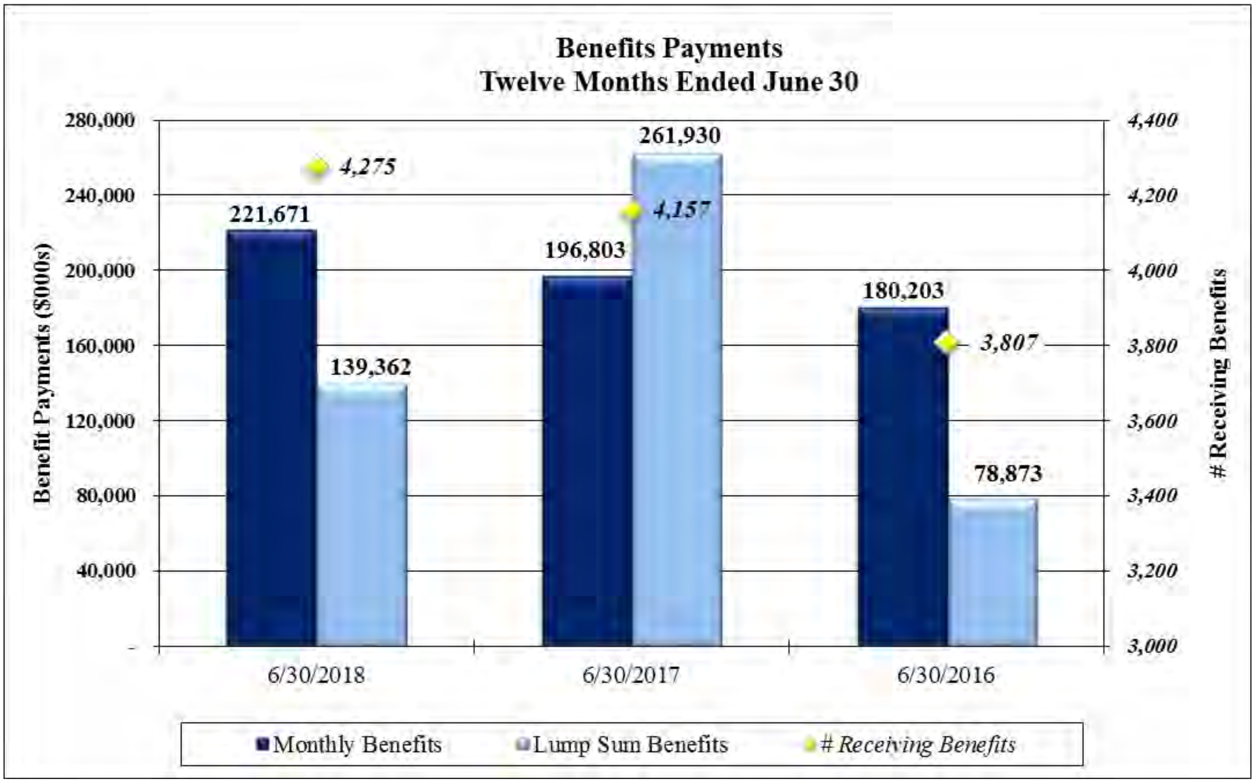
A summary of the Statements of Changes in Fiduciary Net Position for the System is as follows ($000's):

Years ended June 30:	**2018**	2017	2016
Additions:			
Contributions:			
City	**$ 887,143**	$ 133,805	$ 137,392
Members	**45,254**	40,104	39,017
Total contributions	**932,397**	173,909	176,409
Net income (loss) from investing activities	**462,801**	667,171	(136,018)
Net income from securities lending activities	**279**	305	185
Total additions	**1,395,477**	841,385	40,576
Deductions:			
Benefits paid to members	**361,033**	458,733	259,076
Refunds to members	**1,329**	1,696	978
Professional and administrative expenses	**3,679**	4,238	4,585
Total deductions	**366,041**	464,667	264,639
Net increase/(decrease)	**1,029,436**	376,718	(224,063)
Net position restricted for pensions			
Beginning of period	**4,457,178**	4,080,460	4,304,523
End of period	**$ 5,486,614**	$ 4,457,178	$ 4,080,460

The Governing Statue as amended on July 1, 2017, requires contribution payments for fiscal year 2018 equal to 31.77% of payroll, resulting in contributions of $137,143. In addition, the Governing Statute required the City to provide $750,000 thousand through the issuance of pension obligation bonds (POB), which accounts for the increase in City contributions for the year ended June 30, 2018. For fiscal years 2017 and 2016, the June 30, 2011 Agreement with the City contractually required contribution payments in fixed amounts of $133,000 thousand and $123,000 thousand respectively. These contractual provisions account for the increase in City contributions for the years ended

June 30, 2017 and June 30, 2016. As discussed in Note 2 to the financial statements, the contributions for fiscal year 2018 were paid from both the City budget and POB. The contributions were paid in their entirety from the City budget in fiscal years 2017 and 2016.

"Benefits paid to members" consist of both lump sum payments and monthly payments of retirement, disability, and survivor benefits. The System's benefit payment structure provides that members and survivors have the option to receive distributions from their lump sum accounts either on or after the date they begin receiving monthly benefit payments. Due to this ad hoc nature of lump sum distributions the summary results in the accompanying Statements of Changes in Fiduciary Net Position will not show any distinct trends in the "Benefits paid to members" category. The chart below compares the components of benefits paid to members for the years ended June 30, 2018, 2017, and 2016.



For each year, the annual cost of living adjustment (COLA) along with the increase in the number of benefit recipients accounts for the majority of the increase in benefit payments. Total benefits paid in 2018 decreased from 2017 by approximately $(97,700) thousand or (21.3)% compared to an increase of approximately $199,657 thousand or 77.1% between 2016 and 2017. The decrease in 2018 is due to an $(122,569) thousand decrease in lump sum benefits offset by a $24,869 thousand increase in monthly benefits compared to an $183,057 thousand increase in lump sum benefits and a $16,600 thousand increase in monthly benefits in 2017. Average monthly benefit payments were $18,473 thousand and $16,400 thousand per month for 2018 and 2017 respectively. The increase of $2,073 thousand or 12.6% in 2018 was greater than the increase of $1,383 thousand or 9.2% in 2017 while the number of members and survivors who are receiving benefits increased by 118 in 2018 and 350 in 2017.

There was a decrease of $559 thousand in professional and administrative expenses during 2018 as compared to 2017. This decrease is due mainly to completion of negotiations with the City resulting in a decrease of $364 thousand for actuarial services and the completion of enterprise system projects and maintenance resulting in a decrease of $303 thousand for information technology. The decrease of $347 thousand in professional and administrative expenses during 2017 as compared to 2016 was mainly due to the completion in the previous fiscal year of the upgrade project for the System's enterprise software system and website and an increase in actuarial services.

System Highlights

The System's funded ratio pursuant to its most recent actuarial valuation dated July 1, 2017 was 78.3% representing an unfunded actuarial accrued liability of $1,349,679 thousand. The System's funded ratio as of July 1, 2016 was 78.2% representing an unfunded actuarial accrued liability of $1,323,313 thousand.

Contacting the System's Management

This financial report is designed to provide members and other users with a general overview of the System's finances and to show the System's accountability for the funding it receives. If you have questions about this report, you may contact the System's Executive Director at 602 Sawyer, Suite 300, Houston, TX 77007 or by phone at 713-869-8734.

Houston Police Officers' Pension System

Statements of Fiduciary Net Position ($000's)

June 30,		2018		2017
Assets				
Investments, at fair value (Note 3 and Note 4)				
Short term investments	**$**	**942,332**	$	844,812
Fixed income investments		**642,196**		235,049
Equity securities		**1,841,327**		1,435,775
Alternative investments		**2,026,412**		1,939,049
Total Investments		**5,452,267**		4,454,685
Invested securities lending collateral (Note 4)		**109,070**		25,778
Receivables				
City (Note 2)		**5,682**		-
Members		**1,876**		1,516
Investments		**6,466**		3,196
Due from sale of investments		**25,616**		1,262
Other receivables		**44**		23
Total Receivables		**39,684**		5,997
Cash		**33**		104
Total Assets	**$**	**5,601,054**	$	4,486,564
Liabilities				
Payables				
Due for purchase of investments		**3,502**		2,018
Securities lending collateral (Note 4)		**109,070**		25,778
Accrued investment and professional fees		**1,399**		1,127
Other liabilities		**469**		463
Total Liabilities (Note 8)		**114,440**		29,386
Net position restricted for pensions	**$**	**5,486,614**	$	4,457,178

See accompanying notes to financial statements.

Houston Police Officers' Pension System

Statements of Changes in Fiduciary Net Position ($000's)

Years ended June 30,		**2018**		2017
Additions				
Contributions (Note 2 and Note 5)				
City	**$**	**887,143**	$	133,805
Members		**45,254**		40,104
Total contributions		**932,397**		173,909
Investment income				
Net appreciation in fair value of investments		**413,755**		632,552
Interest:				
Short-term investments		**14,070**		5,574
Fixed income investments		**17,725**		10,215
Total interest income		**31,795**		15,789
Dividends		**31,590**		32,923
Total investment income		**477,140**		681,264
Less: investment expense		**(14,339)**		(14,093)
Net income from investing activities		**462,801**		667,171
Securities lending activities (Note 4)				
Securities lending income		**373**		407
Securities lending expense		**(94)**		(102)
Net income from securities lending activities		**279**		305
Total additions		**1,395,477**		841,385
Deductions				
Benefits paid to members		**361,033**		458,733
Refunds to members (Note 1)		**1,329**		1,696
Professional and administrative expenses		**3,679**		4,238
Total deductions		**366,041**		464,667
Net increase in net position		**1,029,436**		376,718
Net position restricted for pensions				
Beginning of period		**4,457,178**		4,080,460
End of period	**$**	**5,486,614**	$	4,457,178

See accompanying notes to financial statements.

1. Plan Description and Contribution Information

General – The Houston Police Officers' Pension System (the System) was created in 1947 by an act of the Fiftieth Legislature of the State of Texas, and is governed by Article 6243g-4, Vernon's Texas Civil Statutes (the Governing Statute) and contracts pursuant to Section 27 thereof. The System is a single employer contributory defined benefit pension plan covering police officers employed full time by the City of Houston (the City or the Employer) that provides for service, disability and death benefits for eligible members and their beneficiaries. The System is a local governmental plan and, therefore, is not subject to the Employee Retirement Income Security Act of 1974 (ERISA). The System is a component unit of the City only to the extent the System receives contributions equal to an amount or percentage of pay of active members in accordance with the Governing Statute.

The System's Board of Trustees in accordance with the Governing Statute is responsible for the general administration, management, and operation of the pension system, including the direction of investment and oversight of the fund's assets. The System's Board of Trustees is composed of seven members as follows: (1) the administrative head of the City or the administrative head's authorized representative; (2) three employees of the police department having membership in the pension system, elected by the active, inactive, and retired members of the pension system; (3) two retired members who are receiving pensions from the system and are not officers or employees of the City, elected by the active, inactive, and retired members of the pension system; and (4) the treasurer of the City or the person discharging the duties of the City treasurer.

At June 30, the System's membership consisted of the following:

June 30,	2018	2017
Retirees and beneficiaries:		
Currently receiving benefits	4,275	4,157
Not yet receiving benefits	26	27
Active members:		
Fully vested	1,808	1,814
Nonvested:		
Hired or rehired before October 9, 2004	613	772
Hired or rehired after October 9, 2004	2,826	2,585
Total members	9,548	9,355

The following sections describe the benefit structure in effect for the plan year ending June 30, 2018. On September 29, 2004, the System and the City entered into an agreement (the October 9, 2004 Agreement) that altered the benefit structure of the System. On June 30, 2011, the System and the City entered into an agreement (the June 30, 2011 Agreement) that altered the City payment schedule and extended the contract term which began on October 9, 2004, through June 30, 2023 and thereafter renews for one-year terms through June 30, 2040 unless either party terminates the agreement. Additional changes to the benefit structure became effective July 1, 2017 due to passage of Senate Bill 2190 by the 85th Legislature of Texas, Regular Session. The benefits described below include those for members hired or rehired on or before October 9, 2004 as well as benefits for members hired or rehired subsequent to October 9, 2004.

Eligibility – Members become eligible to receive a service pension upon retirement with 20 years of service. Members also have the option to select a Delayed Retirement, which allows for vesting after 10 years of service with a pension benefit payable at age 60. Members hired or rehired subsequent to October 9, 2004 are eligible to receive a service pension upon satisfying the Rule of 70 (age plus service equals 70). If a member separates with more than 10 years of service but has yet to satisfy the Rule of 70, the member may apply for a Delayed Retirement payable when age and service total 70.

Benefits – Retirement benefits are equal to 2.75% of the member's pensionable pay for each of the member's first 20 years of service plus 2.00% of pensionable pay for each year in excess of 20 years with no maximum percentage. Members hired or rehired subsequent to October 9, 2004 accrue benefits equal to 2.25% of the member's pensionable pay for each of the member's first 20 years of service plus 2.00% of the member's pensionable pay for each year in excess of 20 years subject to a maximum of 80%. Retired members and surviving spouses are entitled to receive an additional $150 per month in order to defray group medical insurance costs.

Pensionable Pay - Eligible members of the System will have their retirement or DROP benefit (see below) calculated on pensionable pay, which is referred to as Final Average Pay, and is defined as the average of all pay types received by a member over the three years prior to retirement or entrance into DROP exclusive of all categories of overtime. Clothing allowance, motorcycle allowance and mentor pay earned after June 30, 2017 is also excluded.

Deferred Retirement Option Plan – The Deferred Retirement Option Plan (DROP) provides for an optional method of accruing pension benefits. Generally, members with at least 20 years of service are eligible to participate in the DROP. Members hired or rehired subsequent to October 9, 2004 are not eligible to participate in DROP. Upon termination of employment participating members receive their pension benefit in the form of an annuity and a lump sum benefit. The annuity is the member's pension benefit at the time of enrollment in the DROP plus any subsequent cost of living adjustments received prior to July 1, 2017. The lump sum benefit is the accumulated balance in the member's notional DROP account which is equal to an amount calculated as if the member's annuity, employee contributions and an interest component had been deposited in a separate account in the member's name during the member's participation in DROP. Prior to October 9, 2004, 100% of a member's contributions were credited to his or her notional DROP account. Subsequent to that date, an eligible member contributes 9.00% of pensionable pay with 8.75% of pensionable pay credited to his or her notional DROP account and the additional 0.25% credited to the System's general fund. Effective July 1, 2017, member contributions are no longer credited to the DROP account.

Cost of Living Adjustments (COLA) – Pension benefits for eligible members and survivors are adjusted each year at a rate equal to the most recent five fiscal years' smoothed return minus 500 basis points, subject to minimum and maximum increases of 0.0% and 4.0%, respectively. For years 2018, 2019, and 2020, only members and eligible survivors who are 70 years of age or older will receive a COLA. For COLAs beginning with year 2021, eligible members are retired members and eligible survivors age 55 and older as of April 1 of the applicable year, a member or survivor who received benefits before June 8, 1995, or a survivor of an active member who died in the line of duty.

Disability Benefits – Duty connected disability benefits are equal to the greater of 55% of pensionable pay or the accrued service pension. Disabled members who qualify for a Catastrophic Disability, as defined, receive a disability benefit equal to 100% of pensionable pay. Members hired or rehired subsequent to October 9, 2004 are eligible for a duty connected disability benefit equal to the greater of 45% of the member's pensionable pay or the accrued service pension.

Members determined to be eligible for a non-duty connected disability benefit are entitled to a benefit of either 27.5% of pensionable pay, if the member has 10 or fewer credited years of service, or 2.75% per year for credited service in excess of 10 years. Members hired or rehired subsequent to October 9, 2004 are eligible for a non-duty connected disability benefit equal to the greater of 22.5% of the member's pensionable pay or 2.25% per year for credited service equal to or in excess of 10 years up to 20 years and 2.00% per year for credited service equal to or in excess of 20 years.

Death Benefits – Death benefits are available to a surviving spouse, dependent children or a dependent parent in the event of the death of a member either after disability or service retirement, or prior to retirement.

Refunds of Member Contributions – A member with less than 20 years of credited pension service may elect to obtain a refund of member contributions upon termination of service with the Houston Police Department (HPD). This refund does not include interest. Members who terminate with at least 10 years of credited pension service but have not met the requirements for an immediate service retirement, have the option fora Delayed Retirement benefit in lieu of a refund.

Delayed Retirement – A member with at least 10 but less than 20 years of credited pension service at termination of employment with the HPD has the option of either a refund of member contributions, without interest, or a Delayed Retirement benefit. The Delayed benefit is payable at age 60 and is calculated at 2.75% of pensionable pay for each year of credited pension service. Members hired or rehired subsequent to October 9, 2004 with more than 10 years of service are eligible for a Delayed Retirement payable when the sum of his or her age and service total 70 (Rule of 70) calculated at 2.25% of pensionable pay for each year of credited pension service.

Supplemental Monthly Benefit (13th check) – In years in which certain investment performance and actuarial funding requirements are met, the System issues a supplemental monthly benefit payment to retired members and a supplemental credit to DROP participants' accounts in an amount equal to their normal monthly benefit. This benefit is not available for any year in which the System's funded ratio is less than 120%. Members hired or rehired subsequent to October 9, 2004 are not eligible for this benefit.

Lump Sum Benefit – Members retiring with a service or disability benefit receive a one-time $5,000 lump sum benefit. Members hired or rehired subsequent to October 9, 2004 are not eligible for this benefit.

Post Retirement Option Plan – The Post Retirement Option Plan (PROP) allows retired members and survivors to have all or a portion of their DROP lump sum credited to a notional account maintained by the System which accumulates interest and can be disbursed under certain options as designated by the System. Members hired or rehired subsequent to October 9, 2004 are not eligible for this benefit.

Partial Lump Sum Option Plan – The Partial Lump Sum Option Plan (PLOP) provides for an optional lump sum payment of a portion of a member's retirement benefit. A lump sum payment of not more than 20% of the actuarial value of the member's accrued pension at retirement shall be made available to persons who become active members of the System subsequent to October 9, 2004. The benefit shall be actuarially neutral. Thus, the value of the pension the member receives shall be reduced actuarially to reflect the lump sum payment.

2. Contributions and Reserves

Contributions – On July 1, 2017, the Governing Statue was amended. For fiscal year 2018, all members are required to contribute 10.50% of pay. For fiscal year 2017, members hired prior to October 9, 2004 were required to contribute 9.00% of pay and members hired or rehired subsequent to October 9, 2004 were required to contribute 10.25% of pay. Contributions are made on a pre-tax basis pursuant to Governing Statutes.

Under the Governing Statute, the employer contribution rate is determined actuarially, based on a Risk Sharing Valuation Study (RSVS). The Governing Statute required a Final Risk Sharing Valuation Study (RSVS) as of June 30, 2016, which was completed September 25, 2017. This initial RSVS established a corridor midpoint for the employer contribution rate. While inside the RSVS Corridor, the actual employer contribution rate will be the greater of the estimated employer contribution rate and the corridor midpoint. For fiscal year 2018, the actual employer contribution rate equaled the corridor midpoint which was 31.77%, as established in the initial RSVS. Prior to fiscal year 2018 under the October 9, 2004 Agreement, it was agreed that in lieu of contributions to the System made pursuant to actuarial valuations, the City would make cash payments to the System in accordance with a payment schedule as provided for in such Agreement. In the June 30, 2011 Agreement, it was agreed that for fiscal year 2017 the amount to be contributed was a $133,000 thousand fixed payment. For all subsequent fiscal years, the actual employer contribution rate will be the greater of the estimated employer contribution rate and the corridor midpoint.

In addition to the actuarially determined contributions, the Governing Statute required the City to fund $750,000 thousand of the System's unfunded liability on or before December 31, 2017, through the issuance of pension obligation bonds (POB). On August 11, 2017, the System and the City entered into an agreement pursuant to the Governing Statute and allowed under Chapter 107, Texas Local Government Code, as amended (Chapter 107) for the City to fund $750,000 thousand of the System's unfunded liability through the issuance of pension obligation bonds (POB). The proceeds of these pension obligation bonds were received on December 22, 2017.

City contributions in the Statements of Changes in Fiduciary Net Position may be greater than the statutorily required amounts, as members are allowed to contribute accumulated sick and vacation pay to the System upon retirement and such contributions are classified as City contributions.

Pursuant to the Governing Statute and based on the July 1, 2017 actuarial valuation, the City contribution rates and the Actuarial Determined Contributions (ADC) are as shown in the table below for the ten years ending June 30, 2028.

($000's)

Years Ended June 30,	Compensation	Employer Contribution Rate *	Actuarially Determined Contribution (ADC)
2019	$ 452,731	31.85 %	$ 144,195
2020	465,181	31.82	148,021
2021	479,121	31.84	152,552
2022	493,310	31.92	157,465
2023	508,005	31.98	162,460
2024	522,862	32.03	167,473
2025	537,740	32.07	172,453
2026	553,136	32.10	177,557
2027	569,045	32.12	182,777
2028	585,482	32.13	188,115

* The corridor midpoint is used for years 2020 – 2028.

3. Summary of Significant Accounting Policies

Basis of Presentation – As defined by generally accepted accounting principles established by the Governmental Accounting Standards Board (GASB), the accompanying financial statements include solely the accounts of the System, which include all programs, activities and functions relating to the accumulation and investment of the assets and related income necessary to provide the service, disability and death benefits required under the terms of the Governing Statutes and amendments thereto.

Basis of Accounting - Basis of accounting is the method by which revenues and expenses are recognized in the accounts and are reported in the financial statements. The accrual basis of accounting is used for the System. Under the accrual basis of accounting, revenues are recognized when they are earned and collection is reasonably assured, and expenses are recognized when the liability is incurred. Member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due and the employer has made a legally required commitment to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of the Governing Statute. Dividend income is recorded on the ex-dividend date. Income from other investments is recorded when earned. Gains and losses on sales of securities are recognized on the trade date. The cost of investments sold is determined using the average cost method.

Administrative Costs – All administrative costs of the System are paid from the System's assets.

Federal Income Tax – A favorable determination that the System is qualified and exempt from Federal income taxes was received on September 24, 2014. The System’s Board of Trustees believes that the System is designed and continues to operate in compliance with the applicable requirements of the Internal Revenue Code.

Use of Estimates – The preparation of the System’s financial statements, in conformity with accounting principles generally accepted in the United States of America, requires management to make significant estimates and assumptions that affect the reported amounts and net plan assets at the date of the financial statements and the actuarial information included in the footnotes to the financial statements as of the benefit information date, the changes in the System’s net position during the reporting period and, when applicable, disclosures of the contingent assets and liabilities at the date of the financial statements. Actual results could differ from those estimates.

4. Investments

Investment Policy – The System's policy in regard to the allocation of invested assets is established and may be amended by the System's Board of Trustees by a majority vote of its members. It is the policy of the System's Board of Trustees to pursue an investment strategy with a view toward the long term that maximizes the return on the System's assets with acceptable target levels of leverage, and loss of capital, liquidity and volatility risk through the prudent diversification of the portfolio across a broad selection of distinct asset classes. The System's investment policy discourages the use of cash equivalents, except for liquidity purposes. The following was the Board's adopted asset allocation policy as of June 30, 2018:

Asset Class	Target Allocation	
Domestic equity	27.50	%
International equity	22.50	
Fixed income	6.00	
Credit	10.50	
Alternative investments:		
Private equity	17.50	
Real estate	10.00	
Risk parity	7.25	
Hedge funds	8.50	
Cash	(9.75)	
Total	100.00	%

Investment Valuation - Statutes of the State of Texas authorize the System to invest surplus funds in a manner provided by the Government Code, Title 8, Subtitle A, Subchapter C. These statutes stipulate that the governing body of the System is responsible for the management and administration of the funds of the System and shall determine the procedure it finds most efficient and beneficial for the management of the reserve fund of the System. The governing body may directly manage the investments of the System or may choose and contract for professional investment management services. Investments are reported at fair value in accordance with GASB 72*, Fair Value Measurement and Application*, which defines fair value, establishes a framework for measuring fair value, and establishes disclosures about fair value measurements.

GASB 72 establishes a hierarchal disclosure framework which prioritizes and ranks the level of market price observability used in measuring investments at fair value. Market price observability is impacted by a number of factors, including the type of investment and the specific characteristics of the investment. Fair value represents the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Investments with readily available actively quoted prices or for which fair value can be measured from actively quoted prices generally will have a higher degree of market price observability and lesser degree of judgment used in measuring fair value.

Investments measured and reported at fair value are classified and disclosed in one of the following categories:

> Level 1 – Investments traded in an active market with available quoted prices for identical assets as of the reporting date.
>
> Level 2 – Investments not traded on an active market but for which observable market inputs are available for an asset, either directly or indirectly, as of the reporting date.
>
> Level 3 – Investments not traded in an active market and for which no significant observable market inputs are available as of the reporting date.

The System has established a framework to consistently measure the fair value of the System's assets and liabilities in accordance with applicable accounting, legal, and regulatory guidance. This framework has been provided by establishing valuation policy and procedures that will provide reasonable assurance that assets and liabilities are carried at fair value. In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, an investment's level within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement. The System's assessment of the significance of a particular input to the fair value measurement requires judgment and considers factors specific to the investment.

The following tables summarize the valuation of the System's investments in accordance with the above mentioned fair value hierarchy levels as of June 30, 2018 and 2017.

Investments Measured at Fair Value
($000's)

		Fair Value Measurements Using		
	6/30/2018	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level				
Short term investments				
US Treasury bills	$ 99,298	$ 99,298	$ -	$ -
Short term investment funds	843,034	-	843,034	-
Total short term investments	942,332	99,298	843,034	-
Fixed income				
Corporate bonds	151,843	-	151,843	-
ETF funds	71,032	-	71,032	-
High yield funds	61,874	-	61,874	-
Total fixed income	284,749	-	284,749	-
Equity securities				
Domestic equities	261,517	(987)	262,504	-
Total equity securities	261,517	(987)	262,504	-
Alternative investments				
Private equity				
Leveraged buyouts	376,218	-	-	376,218
Energy	154,462	-	-	154,462
Special situations	116,986	-	-	116,986
Private equity secondaries	80,499	-	-	80,499
Venture capital	23,965	142	-	23,823
Other alternatives				
Real estate	333,411	-	-	333,411
Credit	189,105	-	56,144	132,961
Total alternative investments	1,274,646	142	56,144	1,218,360
Total investments by fair value level	2,763,244	$ 98,453	$ 1,446,431	$ 1,218,360
Investments measured at the net asset value (NAV)				
Domestic equities commingled funds	919,988			
International equities commingled funds	659,822			
Portable alpha hedge funds	358,400			
Global macro hedge funds	224,027			
Multi-strategy hedge funds	119,615			
Fixed income commingled funds	357,447			
Long/short credit hedge funds	24,439			
Long/short equity hedge funds	25,285			
Total investments measured at the NAV	2,689,023			
Total investments measured at fair value	$ 5,452,267			

Investments Measured at Fair Value
($000's)

		Fair Value Measurements Using		
	6/30/2017	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level				
Short term investments				
US Treasury bills	$ 90,017	$ 90,017	$ -	$ -
Short term investment funds	754,795	-	754,795	-
Total short term investments	844,812	90,017	754,795	-
Fixed income				
Corporate bonds	124,099	-	124,099	-
High yield funds	59,640	-	59,640	-
Total fixed income	183,739	-	183,739	-
Equity securities				
Domestic equities	258,131	(365)	258,496	-
Total equity securities	258,131	(365)	258,496	-
Alternative investments				
Private equity				
Leveraged buyouts	291,414	-	-	291,414
Energy	126,410	-	-	126,410
Special situations	103,426	-	-	103,426
Private equity secondaries	52,308	-	-	52,308
Venture capital	27,234	-	-	27,234
Other alternatives				
Real estate	294,990	-	-	294,990
Credit	160,895	-	24,190	136,705
Hedge funds - long/short credit	22	-	22	-
Hedge funds - long/short Equity	616	-	616	-
Total alternative investments	1,057,315	-	24,828	1,032,487
Total investments by fair value level	2,343,997	$ 89,652	$ 1,221,858	$ 1,032,487
Investments measured at the net asset value (NAV)				
Domestic equities commingled funds	659,358			
International equities commingled funds	518,286			
Portable alpha hedge funds	474,501			
Global macro hedge funds	210,679			
Multi-strategy hedge funds	126,611			
Fixed income commingled funds	51,310			
Long/short credit hedge funds	45,458			
Long/short equity hedge funds	24,485			
Total investments measured at the NAV	2,110,688			
Total investments measured at fair value	$ 4,454,685			

Short-term investments include funds held in short-term investment funds of the System's custodian and asset managers.

Fixed income investments include US corporate bonds, foreign securities such as dollar denominated and non-dollar denominated issues of private corporations, plus units of commingled fixed income funds of US government securities.

Equity securities consist of individual shares of equity securities plus units of commingled ETF funds of US entities.

Alternative investments consist of investments in hedge funds, real estate, and private equity. These investments are in various investment vehicles including limited partnerships and commingled funds.

The System's custodian bank provides security valuations for equity and fixed income securities utilizing vendor supplied pricing. Based upon the procedures described below, equity securities and short term investments that are valued based on quoted prices in active markets are generally classified as Level 1 while fixed income securities are generally considered to be Level 2 or Level 3 investments. Vendor supplied pricing data for equity securities is based upon the daily closing price from the primary exchange of each security while vendor supplied pricing data for fixed income securities is based upon a combination of market maker quotes, recent trade activity, and observed cash flows. To minimize the potential for inaccurate valuations, multiple price types are obtained from multiple providers and whenever possible prices are put through tolerance checks with exceptions researched and resolved on a same day basis as part of the pricing process. An integral part of the custodian's pricing process is to allow portfolio managers and interested third parties to challenge custodian provided prices which provides additional validation to the custodian's pricing. The evaluation process is handled by the custodian's internal pricing system, which automatically validates substantially all of the System's securities, leaving only exceptions and missing prices for human intervention. The rules this system applies are multi-dimensional and can be applied at a number of different levels, ranging from general to security specific in nature. Consistent with the System's valuation policy, the System's staff maintains and documents an understanding of the custodian's and underlying manager's valuation process and has implemented a program to review and evaluate the reconciliation process and the fair value estimates provided by the custodian and the investment manager.

The System's custodian values the System's investment in limited partnerships at the dollar value provided by the general partners. Based upon the procedures described below, these limited partnerships are generally considered to be Level 3 assets. The fair value of securities held by limited partnerships has been estimated by the general partners in the absence of readily ascertainable fair values. The general partners utilize valuation methods which rely on significant assumptions and inputs of the portfolio company's most recent financial information such as EBITDA and debt and the equity structure of the portfolio company. Valuations may be derived by reference to observable valuation measures for comparable companies and may be adjusted for differences between the investment and the referenced comparables. General partners also utilize relevant information such as discounted cash flow analysis, pending recent transactions and potential initial public offering values in the determination of fair value. Consistent with the System's valuation policy, the System's staff maintains and documents an understanding of the general partner's valuation process and has implemented a program to review and evaluate the fair value estimates provided by each partnership.

The System's custodian values commingled funds at the net asset value provided by the commingled fund's custodian or administrator, as is applicable. The unit values of commingled funds are calculated by the custodian or administrator by dividing the commingled fund's net asset value on the calculation date by the number of units of the commingled fund that are outstanding on the calculation date. The commingled fund's net asset value is calculated by the commingled fund's custodian or administrator by using Level 1, Level 2 or Level 3 prices, as appropriate, to value each security and/or other asset held by the commingled fund on the calculation date, pursuant to the commingled fund's valuation policy. In short, the net asset value of the commingled fund is calculated based on a compilation of primarily observable market information. The number of units of a commingled fund that are outstanding on the calculation date is derived from observable purchase and redemption activity in the commingled fund. Consistent with the System's valuation policy, the System's staff maintains and documents an understanding of the underlying fund's valuation process and has implemented a program to review and evaluate the fair value estimates provided by the commingled fund.

The valuation method for investments measured at the net asset value (NAV) per share (or its equivalent) is presented on the following tables as of June 30, 2018 and 2017.

Investments Measured at the NAV ($000's)

		6/30/2018	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Domestic equities commingled funds	(1)	$ 919,988	$ -	Daily	1 day
International equities commingled funds	(1)	659,822	-	Daily	4 days
Portable alpha hedge funds	(2)	358,400	-	Quarterly/Semi-Annually	60-90 days
Global macro hedge funds	(3)	224,027	-	Monthly/Quarterly	60-90 days
Multi-strategy hedge funds	(4)	119,615	13,500	Various up to two years	60-90 days
Fixed income commingled funds	(5)	357,447		Daily	2 days
Long/short credit hedge funds	(6)	24,439		Quarterly/Annually	60-90 days
Long/short equity hedge funds	(7)	25,285		Quarterly	60-90 days
Total investments measured at the NAV		$ 2,689,023	$ 13,500		

1. *Equities Commingled Funds* – This type invests in five funds, two that are invested in domestic equities and three that are invested in international equities. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These funds have daily liquidity.
2. *Portable Alpha Funds* - This type invests in three funds that are invested in risk parity strategies and global macro or multi-strategy hedge fund strategies. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These strategies generally have quarterly or semi-annual liquidity.
3. *Global Macro Hedge Funds* - This type invests in two hedge funds that take long and short positions in global equity, credit, interest rate, and currency markets. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These funds have monthly or quarterly liquidity.
4. *Multi-Strategy Hedge Funds* - This type invests in seven hedge funds that pursue multiple strategies to diversify risks and reduce volatility. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. One of these funds has monthly liquidity, one fund has quarterly liquidity, three funds have annual liquidity, and two funds have liquidity every two years.
5. *Fixed Income Commingled Funds* – This type invests in domestic bonds. The fair value of the investment in this type has been determined using the NAV per share (or its equivalent) of the investments. These funds have daily liquidity.
6. *Long / Short Credit Hedge Funds* - This type includes investments in two hedge funds that invest both long and short primarily in U.S. credit instruments. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These strategies have quarterly or annually liquidity.
7. *Long / Short Equity Hedge Funds* - This type includes investments in one hedge fund that invests both long and short primarily in U.S. common stocks. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. This fund generally has quarterly liquidity.

Investments Measured at the NAV ($000's)

		6/30/2017	Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Domestic equities commingled funds	(1)	$ 659,358	$ -	Daily	1 day
International equities commingled funds	(1)	518,286	-	Daily	4 days
Portable alpha hedge funds	(2)	474,501	-	Quarterly/Semi-Annually	60-90 days
Global macro hedge funds	(3)	210,679	-	Monthly/Quarterly	60-90 days
Multi-strategy hedge funds	(4)	126,611	-	Various up to two years	60-90 days
Fixed income commingled funds	(5)	51,310	-	Daily	2 days
Long/short credit hedge funds	(6)	45,458	-	Quarterly/Annually	60-90 days
Long/short equity hedge funds	(7)	24,485	-	Quarterly	60-90 days
Total investments measured at the NAV		$ 2,110,688	$ -		

1. *Equities Commingled Funds* – This type invests in two funds, one that is invested in domestic equities and one that is invested in international equities. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These funds have daily liquidity.
2. *Portable Alpha Funds* - This type invests in three funds that are invested in risk parity strategies and global macro or multi-strategy hedge fund strategies. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These strategies generally have quarterly or semi-annual liquidity.
3. *Global Macro Hedge Funds* - This type invests in two hedge funds that take long and short positions in global equity, credit, interest rate, and currency markets. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. These funds have monthly liquidity.
4. *Multi-Strategy Hedge Funds* - This type invests in seven hedge funds that pursue multiple strategies to diversify risks and reduce volatility. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. One of these funds has monthly liquidity, one fund has quarterly liquidity, three funds have annual liquidity, and two funds have liquidity every two years. One of these funds is in the process of liquidation.
5. *Fixed Income Commingled Funds* – This type invests in domestic bonds. The fair value of the investment in this type has been determined using the NAV per share (or its equivalent) of the investments. These funds have daily liquidity.
6. *Long / Short Credit Hedge Funds* - This type includes investments in three hedge funds that invest both long and short primarily in U.S. credit instruments. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. Two of these strategies have quarterly liquidity and one fund has annual liquidity. One of these funds is in the process of liquidation.
7. *Long / Short Equity Hedge Funds* - This type includes investments in one hedge fund that invests both long and short primarily in U.S. common stocks. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. This fund generally has quarterly liquidity and is in the process of liquidation.

Concentrations – As of both June 30, 2018 and 2017, the System did not have any single investment in any one organization which represented greater than 5% of plan net position.

Rate of return – For the year ended June 30, 2018, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 9.8%. For the year ended June 30, 2017, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 16.8%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Investment Risk – The System's investments have been categorized to address deposit and investment risks related to custodial credit risk, credit risk, concentration of credit risk, interest rate risk, and foreign currency risk.

- *Custodial Credit Risk for Deposits and Investments* – Custodial credit risk for investments is the risk that in the event of a failure of the counterparty, the System will not be able to recover the value of the investment or collateral in possession of the counterparty. The System's policy regarding custodial credit risk requires counterparty exposures of each investment manager and strategy, as well as the overall counterparty exposure of the Fund, will be actively managed and monitored by investment managers and Staff. The System considers only demand deposits as cash. As of June 30, 2018 and June 30, 2017, the System had a balance of $33 thousand and $104 thousand, respectively, on deposit at a financial institution. The Federal Depository Insurance Corporation (FDIC) covered cash on deposit up to $250 thousand at this financial institution. Therefore, as of June 30, 2018, none of the System's bank balance of $33 thousand was exposed to custodial credit risk. At June 30, 2018, the System did not have any other investments with other financial institutions subject to custodial credit risk.
- *Credit Risk* – Credit risk is the risk that the counterparty will not fulfill its obligations. As of June 30, 2018 and 2017, the System's fixed income assets that are not U.S. government guaranteed represented 93.7% and 91.7%, respectively, of the System's fixed income plus short term investments portfolio. The tables below and on the following page summarize the System's fixed income portfolio and short term investment exposure levels and credit qualities as of June 30, 2018 and 2017.

Average Credit Quality and Exposure Levels of Non-U.S. Government Guaranteed Securities ($000's)

Fixed Income Security Type	Fair Value **6/30/2018**	Percent of Total	Weighted Average Credit Quality
Corporate Bonds	$ 151,843	10.2	B
Mutual Bond Funds	490,353	33.0	Not Rated
Short Term Investment Funds	843,034	56.8	Not Rated
Total	$ 1,485,230	100.0	

Fixed Income Security Type	Fair Value **6/30/2017**	Percent of Total	Weighted Average Credit Quality
Corporate Bonds	$ 124,099	12.5	B
Mutual Bond Funds	110,950	11.2	BB
Short Term Investment Funds	754,795	76.3	Not Rated
Total	$ 989,844	100.0	

Ratings Dispersion Detail
($000's)

Credit Rating Level **6/30/2018**	Corporate Bonds	Mutual Bond Funds	Short Term Investment Funds
BBB	$ 6,432	$ -	$ -
BB	68,537	-	-
B	66,618	-	-
CCC	8,423	-	-
CC	119	-	-
NR	1,714	490,353	843,034
Total	$ 151,843	$ 490,353	$ 843,034

Credit Rating Level **6/30/2017**	Corporate Bonds	Mutual Bond Funds	Short Term Investment Funds
BBB	$ 3,280	$ -	$ -
BB	49,877	59,640	-
B	57,324	-	-
CCC	11,657	-	-
NR	1,961	51,310	754,795
Total	$ 124,099	$ 110,950	$ 754,795

The System's investment policy allows investment managers full discretion in adopting investment strategies to deal with these risks. Unless otherwise provided in the individual investment manager agreement, the average quality rating of each individual fixed income portfolio on a weighted value basis shall be A-rated or higher, and no issue should have a rating below investment grade (Baa or higher). Certain managers, such as high yield managers, may be exempted from these requirements as provided for in their contracts.

Credit risk for derivative instruments held by the System results from counterparty risk, which is essentially that the counterparty will be unable to fulfill its obligations, which are then assumed by the System. Information regarding the System's credit risk related to derivatives is found under the derivatives disclosures.

Policies regarding credit risk pertaining to credit risk associated with the System's securities lending program are found under the securities lending disclosures.

- *Concentration of Credit Risk* – Concentration of credit risk is the risk of loss attributable to the magnitude of the System's investment in a single issue. The System's investment policy for each specific portfolio limits investments in any one single equity issue to 15% of each portfolio at market value and for any one single equity issue to 5% of the issued and outstanding shares in the issuer corporation. As of both June 30, 2018 and 2017, the System did not have any single investment in any one organization which represented greater than 5% of plan net position.

- *Interest Rate Risk* – Interest rate risk is the risk that changes in interest rates will adversely affect the fair values of the System's financial instruments. This risk is managed within the portfolio using the modified duration methodology. It is widely used in the management of fixed income portfolios and estimates the sensitivity of a bond's price to interest rate changes. The System's investment policy delegates the management of interest rate risk to the individual investment managers in accordance with each manager's designated strategy. Investment managers have full discretion in adopting investment strategies to deal with these risks, and all of the System's fixed income portfolios are managed in accordance with guidelines that are specific as to the degree of interest rate risk taken. The reporting of modified duration as of June 30, 2018 and 2017, found in the tables below and on the following page quantify the interest rate risk of the System's fixed income and short term investments. Interest rate risks associated with derivative instruments are found in the derivatives disclosures of these notes.

Modified Duration by Security Type
($000's)

Security Type **6/30/2018**	Fair Value ($000's)	Percent of Total	Weighted Average Modified Duration (years)
Corporate Bonds	$ 151,843	9.6 %	4.3
Mutual Bond Funds	490,355	30.9	5.2
Short Term Investment Funds	942,332	59.5	0.1
Total	$ 1,584,530	100.0 %	2.3

Security Type **6/30/2017**	Fair Value ($000's)	Percent of Total	Weighted Average Modified Duration (years)
Corporate Bonds	$ 124,099	11.5 %	4.9
Mutual Bond Funds	110,950	10.3	5.2
Short Term Investment Funds	844,812	78.2	0.1
Total	$ 1,079,861	100.0 %	1.2

Modified Duration Analysis by Security Type
($000's)

Corporate Bonds	Fair Value **6/30/2018**	Average Modified Duration	Contribution to Modifed Duration
Less than 1 year	$ 2,112	0.6	0.0
1 to 5 years maturities	91,089	3.3	2.0
5 to 10 years maturities	55,129	5.7	2.1
Greater than 10 years maturities	3,513	10.1	0.2
Total	$ 151,843		4.3
Mutual Bond Funds			
Less than 1 year	$ 10,245	5.2	0.1
1 to 5 years maturities	183,630	5.2	1.9
5 to 10 years maturities	214,103	5.2	2.3
Greater than 10 years maturities	82,377	5.2	0.9
Total	$ 490,355		5.2
Short Term Investment Funds			
Less than 1 year	$ 902,753	0.1	0.1
1 to 5 years maturities	39,579	0.1	0.0
Total	$ 942,332		0.1

Modified Duration Analysis by Security Type
($000's)

Corporate Bonds	Fair Value **6/30/2017**	Average Modified Duration	Contribution to Modifed Duration
Less than 1 year	$ 431	0.7	0.0
1 to 5 years maturities	39,825	3.3	1.1
5 to 10 years maturities	82,961	5.6	3.7
Greater than 10 years maturities	882	9.3	0.1
Total	$ 124,099		4.9
Mutual Bond Funds			
Less than 1 year	$ 4,512	5.2	0.2
1 to 5 years maturities	35,889	5.2	1.7
5 to 10 years maturities	55,748	5.2	2.6
Greater than 10 years maturities	14,801	5.2	0.7
Total	$ 110,950		5.2
Short Term Investment Funds			
Less than 1 year	$ 809,429	0.1	0.1
1 to 5 years maturities	35,383	0.1	0.0
Total	$ 844,812		0.1

- *Foreign Currency Risk* – Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of an investment. The books and records of the System are maintained in US dollars. Foreign currencies and non-US dollar denominated investments are translated into US dollars at the bid prices of such currencies against US dollars at each Statement of Net Position date. Realized and unrealized gains and losses on investments which result from changes in foreign currency exchange rates have been included in the net appreciation in fair value of investments. Net realized foreign currency gains and losses resulting from changes in exchange rates include foreign currency gains and losses between trade date and settlement date of investment securities transactions, foreign currency transactions and the difference between the amounts of interest and dividends recorded on the books of the System and the amount actually received. International and global managers have the permission to use currency forward and futures contracts to hedge currency against the U.S. dollar. Currency forwards and futures used for the purpose of hedging currency shall be subject to the following guidelines: 1) net forward and futures sales of any currency may not exceed total market value of the assets denominated in that currency. This limitation does not apply to global fixed income managers and currency overlay managers if provided for in their contracts, 2) foreign currency exchange contracts with a maturity exceeding 12 months are not permitted, 3) currency options may be entered into in lieu of or in conjunction with forwards sales of currencies with the same limitations as currency forwards and futures. Cross hedging, the selling of one foreign currency for another foreign currency, which may or may not be the base currency of the portfolio, is permitted. The System's exposure to foreign currency risk in U.S. dollars as of June 30, 2018 and 2017, are shown in the table on the following pages.

Foreign Currency Exposure by Asset Class ($000's)
June 30, 2018

Currency	Short Term Investments	Fixed Income	Equities	Alternative Investments	Total
Euro	$ (66,751)	$ 84	$ 271,267	$ 6,260	$ 210,860
Japanese yen	(48,965)	-	198,574	-	149,609
Chinese yuan renminbi	-	-	135,770	-	135,770
Canadian dollar	44,245	-	79,407	-	123,652
British pound sterling	(36,316)	-	148,524	-	112,208
Australian dollar	-	-	57,448	7,325	64,773
Swiss franc	-	-	64,424	-	64,424
South Korean won	-	-	60,539	-	60,539
New Taiwan dollar	-	-	48,293	-	48,293
Indian rupee	-	-	35,737	-	35,737
South African rand	-	5,926	26,296	-	32,222
Brazilian real	-	6,804	24,084	-	30,888
Hong Kong dollar	-	-	29,867	-	29,867
Swedish krona	-	-	21,265	-	21,265
Russian ruble	-	4,073	15,734	-	19,807
Mexican peso	-	7,390	12,054	-	19,444
Indonesian rupiah	-	6,632	7,922	-	14,553
Thai baht	-	4,784	9,031	-	13,814
Danish krone	-	-	13,703	-	13,703
Malaysian ringgit	-	2,958	9,700	-	12,658
Polish zloty	-	6,741	4,588	-	11,329
Singapore dollar	-	-	10,544	-	10,544
Chilean peso	-	2,167	4,611	-	6,779
Philippine peso	-	2,278	3,906	-	6,184
Norwegian krone	-	-	6,125	-	6,125
Colombian peso	-	4,077	1,989	-	6,066
Turkish lira	-	1,749	3,140	-	4,890
New Israeli shekel	-	-	4,333	-	4,333
Peruvian nuevo sol	-	2,262	1,715	-	3,977
Hungarian forint	-	2,439	1,124	-	3,563
Czech koruna	-	2,414	743	-	3,157
United Arab Emirates dirham	-	-	2,650	-	2,650
Qatari riyal	-	-	2,291	-	2,291
New Romanian Leu	-	2,287	-	-	2,287
Dominican peso	-	2,242	-	-	2,242
Uruguayan peso uruguayo	-	2,106	-	-	2,106
New Zealand dollar	-	-	1,755	-	1,755
Argentine austral	-	1,542	-	-	1,542
Egyptian pound	-	-	559	-	559
Pakistan rupee	-	-	279	-	279
Total	$ (107,787)	$ 70,954	$ 1,319,991	$ 13,585	$ 1,296,743

Foreign Currency Exposure by Asset Class ($000's)
June 30, 2017

Currency	Short Term Investments	Equities	Alternative Investments	Total
Euro	$ (109,510)	$ 202,334	$ 8,301	$ 101,125
Canadian dollar	28,096	59,465	-	87,561
Japanese yen	(78,854)	149,295	-	70,441
British pound sterling	(59,261)	122,960	-	63,699
Australian dollar	-	45,207	14,095	59,302
Swiss franc	-	56,772	-	56,772
Chinese yuan renminbi	-	53,919	-	53,919
South Korean won	-	30,408	-	30,408
New Taiwan dollar	-	25,726	-	25,726
Hong Kong dollar	-	21,979	-	21,979
Swedish krona	-	18,911	-	18,911
Indian rupee	-	16,832	-	16,832
South African rand	-	14,779	-	14,779
Brazilian real	-	14,526	-	14,526
Danish krone	-	11,450	-	11,450
Singapore dollar	-	8,908	-	8,908
Mexican peso	-	8,414	-	8,414
Russian ruble	-	7,164	-	7,164
Malaysian ringgit	-	5,716	-	5,716
Indonesian rupiah	-	4,889	-	4,889
Thai baht	-	4,515	-	4,515
Norwegian krone	-	4,276	-	4,276
New Israeli shekel	-	3,500	-	3,500
Polish zloty	-	2,827	-	2,827
Turkish lira	-	2,698	-	2,698
Philippine peso	-	2,605	-	2,605
Chilean peso	-	2,417	-	2,417
Colombian peso	-	1,063	-	1,063
New Zealand dollar	-	957	-	957
Peruvian nuevo sol	-	791	-	791
United Arab Emirates dirham	-	738	-	738
Qatari riyal	-	655	-	655
Hungarian forint	-	545	-	545
Czech koruna	-	361	-	361
Egyptian pound	-	342	-	342
Pakistan rupee	-	130	-	130
Total	$ (219,529)	$ 908,077	$ 22,396	$ 710,944

Securities Lending Program – The System's Board of Trustees' policies permit the System to lend securities (domestic and international equities and fixed income) to securities firms on a temporary basis through its custodian bank. The System receives fees for all loans and retains the right to all interest and dividend payments while the securities are on loan. Cash, letters of credit or various government securities having market values equal to or exceeding 102% and 105% of the value of the loaned securities for domestic and international securities, respectively, collateralize all security loan agreements. Whenever the market value of the securities on loan changes, the borrower must adjust the collateral accordingly. The System's bank pools all collateral received from securities lending transactions and invests any cash collateral. The System holds an undivided share of the collateral provided by the borrowers of the securities. At June 30, 2018 the weighted-average maturity of the collateral pool was 30 days. The relationship between the maturities of the collateral pool and the System's loans has not been determined. Cash collateral invested in the custodian bank collateral pool at June 30, 2018 and 2017, was $109,070 thousand and $25,778 thousand, respectively. The System also had non-cash collateral at June 30, 2018 and 2017, of $14,284 thousand and $10,173 thousand respectively, consisting of treasury securities and letters of credit. The System cannot sell or pledge the collateral unless the borrower fails to return the securities borrowed.

The market value of securities on loan at June 30, 2018 and 2017 was $120,404 thousand and $35,189 thousand, respectively. At June 30, 2018, the System had no credit risk exposure to borrowers because the amounts the System owes the borrowers, $123,354 thousand, exceeds the amounts the borrowers owe the System, $120,404 thousand.

Derivatives – The System's investment managers may invest in derivatives if permitted by the manager's contract with the System's Board of Trustees. The System's staff monitors guidelines and compliance. From time to time the System's investment managers will invest in equity, fixed income and short term futures contracts along with foreign currency forward contracts. No derivatives are purchased with borrowed funds.

The fair value balance of posted margin and collateral and notional amounts of derivative instruments outstanding at June 30, 2018 and 2017, classified by type, and the changes in fair value of such derivative instruments for the year then ended is shown in the tables below. The Change in Fair Value figures are reported as a component of net appreciation (depreciation) in the Statements of Changes in Fiduciary Net Position.

Derivative Investments by Type
($000's)

	Year ending June 30, 2018	As of June 30, 2018			
	Changes in Fair Value	Posted Margin	Collateral Held at Custodian Bank	Collateral Held at Broker	Notional Value
Equity Futures	$ 77,436	$ 66,351	$ 707,144	$ -	$ 1,154,202
Currency Futures	(16,584)	(872)	27,856	-	(188,056)
Fixed Income Futures	810	-	2	-	-
Equity Options	14,434	-	19,815	39,504	(373,544)

	Year ending June 30, 2017	As of June 30, 2017			
	Changes in Fair Value	Posted Margin	Collateral Held at Custodian Bank	Collateral Held at Broker	Notional Value
Equity Futures	$ 147,599	$ 54,388	$ 603,968	$ -	$ 1,005,928
Currency Futures	11,794	6,969	35,263	-	(218,903)
Equity Options	11,081	-	16,177	29,857	(259,682)

Futures are used to obtain market exposure and to take advantage of mis-pricing opportunities. When a position is taken in a futures contract, a margin is posted and the contract is subject to daily mark-to-market adjustments. For options, no margin is posted. Instead, options are purchased at a premium, which is either forfeited or recouped, depending on the gain or loss on the contract. Foreign currency contracts are used to hedge against the currency risk in the System's investments in foreign equity and fixed income securities. To liquidate the contract prior to expiration an offsetting position in the same contract must be taken.

These derivative instruments are subject to the following risks:

- *Custodial Credit Risk* – Custodial credit risk for derivative instruments is the risk that, in the event of the failure of the counterparty to a transaction, the System will not be able to recover the value of the derivative instruments or collateral securities that are in the possession of an outside party. Consistent with the System's investment policy, the System's derivative instruments were held by the counterparty that was acting as the System's agent.
- *Credit Risk* –Credit risk is the risk that the counterparty will not fulfill its obligations. The System does not have an investment policy specifically regarding credit risk for derivative instruments and instead allows investment managers full discretion in adopting investment strategies to deal with this risk. The System's investment managers seek to control this risk through counterparty credit evaluations and approvals, counterparty credit limits, and exposure monitoring procedures.

- *Interest Rate Risk* – Interest rate risk is the risk that changes in interest rates will adversely affect the fair values of the System's derivative instruments.
- *Foreign Currency Risk* – Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of derivative instruments. The System's exposure to foreign currency risk derives from its positions in foreign currency denominated international equity and fixed income investments as outlined in the following schedule. The System has a currency hedging program in place that hedges fifty percent of the exposure to the Euro, Pound, and Yen exposure in these investment programs. This hedging program is disclosed elsewhere in this footnote. The System's derivative instruments exposure to foreign currency risk in U.S. dollars as of June 30, 2018 and 2017, is shown in the tables below and on the following page.

Foreign Currencey Exposure for Derivatives ($000's)
June 30, 2018

Currency	Equity Derivatives	Currency Derivatives	Total
Canadian dollar	$ 43,645	$ 41,507	$ 85,152
Euro	150,048	(66,751)	83,297
Japanese yen	110,000	(48,965)	61,035
Chinese yuan renminbi	52,184	-	52,184
British pound sterling	82,275	(36,316)	45,959
Swiss franc	35,688	-	35,688
Australian dollar	31,823	-	31,823
South Korean won	23,269	-	23,269
New Taiwan dollar	18,562	-	18,562
Hong Kong dollar	16,545	-	16,545
Indian rupee	13,736	-	13,736
Swedish krona	11,780	-	11,780
South African rand	10,107	-	10,107
Brazilian real	9,257	-	9,257
Danish krone	7,591	-	7,591
Singapore dollar	5,841	-	5,841
Russian ruble	5,623	-	5,623
Mexican peso	4,633	-	4,633
Malaysian ringgit	3,728	-	3,728
Thai baht	3,471	-	3,471
Norwegian krone	3,393	-	3,393
Indonesian rupiah	3,045	-	3,045
New Israeli shekel	2,400	-	2,400
Chilean peso	1,772	-	1,772
Polish zloty	1,763	-	1,763
Philippine peso	1,501	-	1,501
Qatari riyal	1,305	-	1,305
Turkish lira	1,207	-	1,207
United Arab Emirates dirham	1,018	-	1,018
New Zealand dollar	972	-	972
Colombian peso	764	-	764
Peruvian nuevo sol	659	-	659
Hungarian forint	432	-	432
Czech koruna	286	-	286
Egyptian pound	215	-	215
Pakistan rupee	107	-	107
Total	$ 660,646	$ (110,525)	$ 550,121

Foreign Currencey Exposure for Derivatives ($000's)
June 30, 2017

Currency	Equity Derivatives	Currency Derivatives	Total
Canadian dollar	$ 27,935	$ 28,734	$ 56,669
Chinese yuan renminbi	27,843	-	27,843
Swiss franc	25,178	-	25,178
Australian dollar	21,617	-	21,617
South Korean won	15,581	-	15,581
New Taiwan dollar	12,477	-	12,477
Hong Kong dollar	10,842	-	10,842
Euro	99,861	(109,510)	(9,649)
Swedish krona	8,864	-	8,864
Indian rupee	8,793	-	8,793
Japanese yen	70,793	(78,854)	(8,061)
Brazilian real	6,624	-	6,624
South African rand	6,509	-	6,509
British pound sterling	53,497	(59,273)	(5,776)
Danish krone	5,755	-	5,755
Singapore dollar	3,998	-	3,998
Mexican peso	3,684	-	3,684
Russian ruble	3,156	-	3,156
Indonesian rupiah	2,452	-	2,452
Malaysian ringgit	2,373	-	2,373
Thai baht	2,170	-	2,170
Norwegian krone	2,077	-	2,077
New Israeli shekel	1,435	-	1,435
Polish zloty	1,295	-	1,295
Philippine peso	1,180	-	1,180
Turkish lira	1,176	-	1,176
Chilean peso	1,136	-	1,136
United Arab Emirates dirham	738	-	738
Qatari riyal	655	-	655
New Zealand dollar	514	-	514
Colombian peso	449	-	449
Peruvian nuevo sol	368	-	368
Hungarian forint	325	-	325
Czech koruna	175	-	175
Pakistan rupee	130	-	130
Egyptian pound	129	-	129
Total	$ 431,783	$ (218,903)	$ 212,880

Alternative Investments – As of June 30, 2018 and 2017, the System was invested in various partnerships, separate accounts and commingled funds across various types of alternative investments as detailed in the table below.

Investment Type	Fair Value ($000's) June 30, 2018	June 30, 2017
Private Equity		
Leveraged Buyouts	$ 376,217	$ 291,414
Energy	154,462	126,410
Special Situations	116,986	103,426
Private Equity Secondaries	80,499	52,308
Venture Capital	23,966	27,234
Other Alternatives		
Real Estate	333,411	294,990
Credit	189,105	160,895
Hedge Funds		
Portable alpha hedge funds	358,400	474,501
Global macro hedge funds	224,027	210,679
Multi-strategy hedge funds	119,615	126,611
Long/short credit hedge funds	24,439	45,480
Long/short equity hedge funds	25,285	25,101
	$ 2,026,412	$ 1,939,049

Supplemental Information on investment and professional expenses included in Schedule II on page 53 herein does not include the investment management fees and performance fees embedded in the structure of the private equity and other limited partnership investments listed above. Rather, these fees are a component of the Net appreciation in fair value of investments in the accompanying Statements of Changes in Fiduciary Net Position.

5. Deferred Retirement Option Program (DROP) Balances

The Deferred Retirement Option Plan (DROP) is an optional method of accruing pension benefits under the System's benefit structure. Members with at least 20 years of service and who were hired prior to October 9, 2004, are eligible to participate in the DROP. The lump sum benefit is the accumulated balance in the member's notional DROP account which is equal to an amount calculated as if the member's annuity, employee contributions and an interest component had been deposited in a separate account in the member's name during the member's participation in DROP. Prior to October 9, 2004, 100% of a member's contributions were credited to his or her notional DROP account. Subsequent to that date, an eligible member contributes 9.00% of pensionable pay with 8.75% of pensionable pay credited to his or her notional DROP account and the additional 0.25% credited to the System's general fund. The tables on the following page shows the change in DROP accounts during the years ended June 30, 2018 and 2017.

DROP Activity

Year ended June 30, 2017	DROP Accounts ($000's)		DROP Participants
Balance at June 30, 2016	$ 957,323	Participants at June 30, 2016	2,058
Accumulations	155,058	Entrants	90
Transfers to PROP	(228,259)	Withdrawals	(342)
Distributions	(109,051)	Participants at June 30, 2017	1,806
Balance at June 30, 2017	$ 775,071		

Year ended June 30, 2018	DROP Accounts ($000's)		DROP Participants
Balance at June 30, 2017	$ 775,071	Participants at June 30, 2017	1,806
Accumulations	162,511	Entrants	137
Transfers to PROP	(101,910)	Withdrawals	(149)
Distributions	(40,187)	Participants at June 30, 2018	1,794
Balance at June 30, 2018	$ 795,485		

The Post Retirement Option Plan (PROP) allows retired members to have all or a portion of their monthly retirement and DROP lump sum credited to a notional account maintained by the System which accumulates interest and can be disbursed to the member under certain options as designated by the System. Surviving spouses can transfer a DROP or PROP balance to a PROP account of their own but are not eligible to credit all or a portion of their survivor benefit to a PROP account. Members hired or rehired subsequent to October 9, 2004 are not eligible for this benefit. The following tables shows the change in PROP accounts during the years ended June 30, 2018 and 2017.

PROP Activity

Year ended June 30, 2017	PROP Accounts ($000's)		PROP Participants
Balance at June 30, 2016	$ 871,432	Participants at June 30, 2016	1,569
Accumulations	49,295	Entrants	208
Transfers from DROP	228,259	Withdrawals	(17)
Distributions	(152,781)	Participants at June 30, 2017	1,760
Balance at June 30, 2017	$ 996,205		

Year ended June 30, 2018	PROP Accounts ($000's)		PROP Participants
Balance at June 30, 2017	$ 996,205	Participants at June 30, 2017	1,760
Accumulations	42,894	Entrants	79
Transfers from DROP	101,910	Withdrawals	(15)
Distributions	(98,706)	Participants at June 30, 2018	1,824
Balance at June 30, 2018	$ 1,042,303		

6. Net Pension Liability

The net pension liability is measured as the total pension liability, less the amount of the pension plan's fiduciary net position. The components of the net pension liability at June 30, 2018 and 2017 were as follows ($000's):

	6/30/2018	6/30/2017
Total pension liability	$ 6,745,438	$ 6,508,122
Plan fiduciary net position	5,486,613	4,457,178
System's net pension liability	$ 1,258,825	$ 2,050,944
Plan fiduciary net position as a percentage of the total pension liability	81.34%	68.49%

Actuarial assumptions – The total pension liability was determined by an actuarial valuation as of July 1, 2018 and July 1, 2017, using the following actuarial assumptions, applied to all periods included in the measurement:

	July 1, 2018	July 1, 2017
Inflation	2.75%	2.75%
Salary Increases	0.00% to 12.00% , plus a 2.75% inflation and productivity component	0.00% to 12.00% , plus a 2.75% inflation and productivity component
Investment Rate of Return	7.00%, net of pension plan investment expense, including inflation	8.00%, net of pension plan investment expense, including inflation
Mortality	Healthy retirees - The Gender-distinct RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustment for Males and no collar adjustment for Females. The rates are projected on a fully generational basis by the ultimate values of scale MP-2014 to account for future mortality improvements. Disabled males and females – The gender-distinct RP-2014 Disabled Retiree Mortality Tables are used without adjustment. The rates are projected on a fully generational basis by the ultimate values of scale MP-2014 to account for future mortality improvements. Active members - The Gender-distinct RP-2014 Employee Mortality Tables with Blue Collar Adjustment. The rates are projected on a fully generational basis by the ultimate values of scale MP-2014 to account for future mortality improvements..	Healthy retirees - The Gender-distinct RP2000 Combined Healthy Mortality Tables with Blue Collar Adjustment are used with male rates multiplied by 109% and female rates multiplied by 103%. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements. Disabled males and females – The gender-distinct RP2000 Disabled Retiree Mortality Tables are used without adjustment. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements. Active members - The Gender-distinct RP2000 Combined Healthy Mortality Tables with Blue Collar Adjustment are used with male rates multiplied by 54% and female rates multiplied by 51%. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements. An additive factor of .0003 is applied to all active mortality rates.

The long-term expected rate of return on the System's 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 real rates of return for each major asset class included in the pension plan's target asset allocation as of June 30, 2018 (see the discussion of the pension plan's investment policy) are summarized in the table on the following page:

Asset Class	Long-Term Expected Real Rate of Return
Domestic equity	3.90 %
International equity	4.30
Fixed income	-
Credit	5.40
Alternative investments:	
Private equity	5.80
Real estate	5.00
Risk parity	8.30
Hedge funds	4.40
Cash	(1.25)

Discount rate – A single discount rate of 7.00% was used to measure the total pension liability for the June 30, 2018 measurement date. This single discount rate was based on the expected rate of return on pension plan investments of 7.00% and the current municipal bond rate was not applicable. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at the rate determined actuarially in the annual RSVS. Based on these 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, a single discount rate of 7.00% was applied to all periods of projected benefit payments to determine the total pension liability. For the June 30, 2017 measurement date, the single discount rate used was 7.00%.

Sensitivity of the net pension liability to changes in the discount rate – The following table presents the net pension liability as of July 1, 2018, calculated using the discount rate of 7.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate:

($000's)	**1% Decrease 6.00%**	**Current Discount Rate 7.00%**	**1% Increase 8.00%**
Net pension liability	$ 2,006,435	$ 1,258,825	$ 648,429

7. Litigation

In May 2015, HPOPS, along with hundreds of other entities, was named as a defendant in a bankruptcy adversary proceeding, Official Committee of Unsecured Creditors of Motors Liquidation Co. f/k/a/ General Motors Corp. v. JPMorgan Chase Bank , N.A., 09-00504 (Bankr. S.D.N.Y. 2009). In this litigation, the Unsecured Creditors' Committee for the General Motors (GM) bankruptcy is attempting to claw back funds used to pay off a piece of GM term debt that HPOPS held in 2009. A total of $587,248 is potentially at stake, but if a clawback were ordered, JP Morgan admits that it would be obligated to reimburse HPOPS for all but $15,948 of that amount. The litigation is ongoing.

8. Commitments and Contingencies

As described in Note 1, there are 3,439 non-vested active members of the System who are entitled to refunds of their accumulated contributions, without interest, upon termination of employment with the City prior to being eligible for pension benefits. At June 30, 2018 and 2017, aggregate contributions from these members of the System were approximately $168,949 thousand and $160,034 thousand, respectively. The portion of these contributions that might be refunded to members who terminate prior to pension eligibility has not been determined.

At June 30, 2018 and 2017, the total accumulated lump sum benefit due to DROP members was approximately $795,485 thousand and $775,071 thousand, respectively.

At June 30, 2018 and 2017, the total accumulated lump sum benefit due to PROP participants was $1,042,303 thousand and $996,205 thousand, respectively.

The System has outstanding investment commitments to various limited partnerships totaling $965,500 thousand and $942,205 thousand, as of June 30, 2018 and 2017, respectively. These outstanding commitment amounts include amounts that are due for investments that may have been made on behalf of the limited partnerships prior to the Statement of Net Position dates.

The System has a lease for the office it occupies through October 31, 2020. The monthly base rental and outstanding lease commitment is as detailed in the following chart ($000's).

Period	Monthly Base Rent	Fiscal Year	Total Rent
May 2017 - April 2018	$ 21	2019	$ 259
May 2018 - April 2019	22	2020	265
May 2019 - April 2020	22	2021	90
May 2020 - October 2020	23	Beyond 2021	-
			$ 614

9. Subsequent Events

The System has evaluated subsequent events through October 9, 2018, the date the financial statements were available for issuance.

Schedule of Changes in the Net Pension Liability and Related Ratios
($000's)

Fiscal year ending June 30,	2018	2017	2016	2015	2014
Total Pension Liability					
Service Cost	$ 63,632	$ 60,930	$ 66,098	$ 56,062	$ 52,844
Interest	445,113	433,598	488,223	473,065	466,649
Benefit Changes (1)	-	(1,006,000)	-	-	-
Difference between Expected and Actual Experience	69,534	80,023	10,390	26,706	(41,034)
Assumption Changes	21,399	778,710	(676,151)	664,974	162,849
Benefit Payments	(361,033)	(458,733)	(259,076)	(225,656)	(211,690)
Refunds	(1,329)	(1,696)	(978)	(945)	(906)
Net Change in Total Pension Liability	237,316	(113,168)	(371,494)	994,206	428,712
Total Pension Liability - Beginning	6,508,122	6,621,290	6,992,784	5,998,578	5,569,866
Total Pension Liability - Ending (a)	$ 6,745,438	$ 6,508,122	$ 6,621,290	$ 6,992,784	$ 5,998,578
Plan Fiduciary Net Position					
Employer Contributions	$ 887,143	$ 133,805	$ 137,392	$ 113,665	$ 103,372
Employee Contributions	45,254	40,104	39,017	37,719	37,012
Pension Plan Net Investment Income	463,080	667,476	(135,833)	35,341	649,153
Benefit Payments	(361,033)	(458,733)	(259,076)	(225,656)	(211,690)
Refunds	(1,329)	(1,696)	(978)	(945)	(906)
Pension Plan Administrative Expense	(3,679)	(4,238)	(4,585)	(3,478)	(3,439)
Net Change in Plan Fiduciary Net Position	1,029,436	376,718	(224,063)	(43,354)	573,502
Plan Fiduciary Net Position - Beginning	4,457,178	4,080,460	4,304,523	4,347,877	3,774,375
Plan Fiduciary Net Position - Ending (b)	$ 5,486,614	$ 4,457,178	$ 4,080,460	$ 4,304,523	$ 4,347,877
Net Pension Liability - Ending (a) - (b)	$ 1,258,824	$ 2,050,944	$ 2,540,830	$ 2,688,261	$ 1,650,701
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	81.34%	68.49%	61.63%	61.56%	72.48%
Covered Payroll	$ 412,786	$ 424,300	$ 407,058	$ 395,360	$ 388,756
Net Pension Liability as a Percentage of Covered Employee Payroll	304.96%	483.37%	624.19%	679.95%	424.61%

(1) The benefit changes in fiscal year 2017 are detailed in the "Final Risk Sharing Valuation Study as of June 30, 2016" dated September 25, 2017, include changes to normal retirement eligibility, normal retirement benefit, and post-retirement Cost of Living Adjustments (COLA).

(2) This schedule is intended to present information for 10 years. GASB Statement 67 established the requirement for this schedule and went into effect for fiscal year ending June 30, 2014. The statement allows that if retroactive information is not presented for the full 10 years, required supplementary information should be presented for as many years for which information measured in conformity with the requirements of this Statement is available in the transition year and until 10 years of such information is available.

Schedule of Employer Contributions
($000's)

Measurement Year Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2014	$ 139,991	$ 103,372	$ 36,619	$ 388,756	26.59 %
2015	150,949	113,665	37,284	395,360	28.75
2016	161,154	137,392	23,762	407,058	33.75
2017	167,980	133,805	34,175	424,300	31.54
2018	131,142	887,143	(756,001)	412,786	214.92

This schedule is intended to present information for 10 years. GASB Statement 67 established the requirement for this schedule and went into effect for fiscal year ending June 30, 2014. The statement allows that if retroactive information is not presented for the full 10 years, required supplementary information should be presented for as many years for which information measured in conformity with the requirements of this Statement is available in the transition year and until 10 years of such information is available.

Notes to Schedule

Valuation Date: July 1, 2018

Actuarially determined contribution rates, payable by the City, are determined in accordance with the 2016 Risk Sharing Valuation Study (RSVS) and become effective in the fiscal year beginning one year after the valuation date. Previously, actual contributions were based on the terms of the 2011 Meet and Confer Agreement. For more information regarding the actuarially determined contribution, refer to the July 1, 2018 HPOPS Valuation Report.

A new set of assumptions were adopted in the July 1, 2018 actuarial valuation and will be first reflected in the contribution rate determined for the fiscal year ending 2020.

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial Cost Method	Ultimate Entry Age Normal
Amortization Method	Level Percentage of Payroll, 30 year closed laddered bases
Remaining Amortization Period	30 years
Asset Valuation Method	The actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actuarial value of assets was set equal to the market value of assets as of July 1, 2016.
Inflation	2.75%
Salary Increases	0.00% to 12.00% , plus a 2.75% inflation and productivity component
Investment Rate of Return	7.00%
Retirement Age	Experience-based table of rates based on age and years of service. The assumption was last updated in the July 1, 2018 valuation pursuant to an experience study of the five-year period ending June 30, 2017.
Mortality	Healthy retirees - The Gender-distinct RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustment for males and no collar adjustment for females. The base rates were developed using the 2006 central rates, projected forward to 2018 using the MP-2017 projection scale. The rates are projected on a fully generational basis by ultimate values of scale MP-2014 to account for future mortality improvements. Disabled males and females – The gender-distinct RP-2014 Disabled Retiree Mortality Tables are used without adjustment. The rates are projected on a fully generational basis by the ultimate values of scale MP to account for future mortality improvements. (continued on next page) (continued from previous page) Active members - The Gender-distinct RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustment are used without adjustment. The rates are projected on a fully generational basis by the ultimate values of scale MP to account for future mortality improvements.

Schedule of Investment Returns

Fiscal Year Ended June 30,	Annual Money-weighted Rate of Return, net of Investment Expense
2014	17.4 %
2015	0.8 %
2016	(3.2)%
2017	16.8 %
2018	9.8 %

This schedule is intended to present information for 10 years. GASB Statement 67 established the requirement for this schedule and went into effect for fiscal year ending June 30, 2014. The statement allows that if retroactive information is not presented for the full 10 years, required supplementary information should be presented for as many years for which information measured in conformity with the requirements of this Statement is available in the transition year and until 10 years of such information is available.

Houston Police Officers' Pension System

Investment, Professional and Administrative Expenses ($000's)

Year ended June 30,	2018	2017
Investment services:		
Custodial services	$ 249	$ 242
Money management services	12,680	12,480
Consulting services	812	800
Department operating expense	598	571
Total investment services	14,339	14,093
Professional services:		
Actuarial services	118	482
Auditing services	126	101
Election audit services	21	35
Legal services	66	96
Lobbyist services	372	393
Total professional services	703	1,107
Administrative expenses:		
Information technology	264	575
Education	29	36
Fiduciary insurance	93	91
Office rent	237	245
Other office costs	2,353	2,184
Total administrative expenses	2,976	3,131
	$ 18,018	$ 18,331

Houston Police Officers' Pension System

Summary **of Investment and Professional Services ($000's)**

Twelve Months Ended June 30, 2018	Official System Position	Expense	Nature of Services
Franklin Park Associates, LLC	Consultant	$ 400	Consulting
Mercer Investment Consulting LLC	Consultant	412	Consulting
The Northern Trust Company	Custodian	249	Custodian
AQR Capital Management LLC	Money Manager	2,992	Money Management
BlackRock Institutional Trust	Money Manager	539	Money Management
Blackstone Alternative Solutions LLC	Money Manager	78	Money Management
Bridgewater Associates, Inc.	Money Manager	5,818	Money Management
The Northern Trust Company	Money Manager	1,093	Money Management
Parametric	Money Manager	1,631	Money Management
Shenkman Capital Management, Inc.	Money Manager	529	Money Management
Gabriel Roeder Smith & Co.	Actuary	118	Actuarial
BDO USA, LLP	Auditors	126	Auditing
Burford Perry LLP	Attorneys	54	Legal Service
IceMiller LLP	Attorneys	7	Legal Service
Kasowitz, Benson, Torres & Friedman LLP	Attorneys	1	Legal Service
HillCo Partners, LLC	Attorneys	157	Lobbyists
Locke Lord LLP	Attorneys	211	Lobbyists
Bickley Prescott & Co.	Consultant	21	Election Auditing
Other	Other	8	Other
Total investment and professional services		$ 14,444	


HOUSTON
CITY OF HOUSTON POLICE
SPACE CITY U.S.A.
POLICE

SECTION THREE

INVESTMENT SECTION

Responsibilities of the Board of Trustees

The primary fiduciary fiscal responsibility of the Board of Trustees is to insure that the System's assets are responsibly managed in accordance with the actuarial needs of the System, and also with sound, generally accepted financial investment procedures. The determination of the appropriate asset mix is based on capital market assumptions that incorporate historical returns, volatility and correlation of various asset classes as well as the consideration of liquidity and current and forward-looking market expectations.

The Standard of Investment for the System in making investments is to exercise the judgment and care in the circumstances then prevailing which persons of prudence, discretion and intelligence exercise in the management of their own affairs. The Trustees' responsibility is to invest the System's funds solely in the interest of the membership and their beneficiaries, and for the exclusive purpose of providing benefits to the membership and their beneficiaries and defraying reasonable expenses of administering the System.

Investment Philosophy and Objectives

The Board of Trustees believes that the System's assets should be managed in a way that reflects the uniqueness of the System and that the System's assets should be diversified over a spectrum of investment strategies. Specifically, the Board recognizes and adheres to the following philosophical positions:

- Diversification should be based upon the prudent allocation of risk rather than solely the allocation of capital.

- Asset classes are priced to have long-term expected returns above cash and their return above cash is proportional to their risk (they have similar Sharpe Ratios). Since asset classes have similar expected Sharpe Ratios, they can be made competitive through the prudent use of leverage or leverage-like techniques.

- Over the long term, the risk of owning equities has been, and should continue to be, rewarded with a somewhat greater return than that available from fixed income investments.

- Fixed income investments provide the System with an investment strategy that contributes diversification, liquidity and a predictable stream of income; and that dampens volatility in investment returns.

- Diversification into alternative investments provides the System with an opportunity to enhance returns and to achieve broader diversification of the System's assets.

Investment Policy

The Board of the Houston Police Officers' Pension System (HPOPS) has established an Investment Policy with the following broad guidelines and objectives.

- Establish overall financial objectives and set investment policy
- Select appropriate investment options
- Select qualified investment manager(s) and consultants
- Select a qualified custodian
- Communicate on a structured and ongoing basis with those responsible for investment results; and
- Monitor performance to assure that objectives are being met and that policy and guidelines are being followed.

This Investment Policy represents the formal document for HPOPS and is to be communicated to the appointed Investment Manager(s) and is their principal source for developing an appropriate investment strategy and, in addition, serves as the basis for these Managers' and the System's future performance evaluation.

Investment Strategy and Performance

The System's asset allocation strategy is reviewed periodically by the Board and is changed in anticipation of or in response to changing market conditions. The current asset allocation targets and the actual asset allocation of the System at June 30, 2018 are as follows:

	Target % of Fund	Current Actual % of Fund	Dollars Invested (000's)
Domestic Equity	27.5%	30.3%	$ 1,484,436
International Equity	22.5%	23.9%	1,128,138
Total Equity	50.0%	54.2%	2,612,574
Credit Strategies	10.5%	7.0%	381,711
Traditional Fixed Income	6.0%	8.7%	478,440
Total Fixed Income	16.5%	15.7%	860,151
Private Equity	15.0%	10.9%	596,451
Risk Parity	7.3%	6.8%	373,727
Hedge Funds	8.5%	8.3%	452,063
Real Estate	10.0%	6.1%	333,686
Energy	2.5%	2.8%	154,462
Total Alternatives	43.3%	34.9%	1,910,389
Total Cash	-9.8%	-4.7%	95,959
Total Fund	100.0%	100.0%	$ 5,479,073

Fiscal year 2018 was driven by sustained global growth, strong corporate earnings and positive investor sentiment. Global economies continued to expand throughout the year, allowing investors to shrug off trade war fears, Fed hike speculation and inflation concerns. Passage of the Tax Cuts and Jobs Act of 2017 further stimulated the economy due to more favorable laws relating to the corporate sector. The System fully participated in this risk on environment returning 10.2%.

Plan assets also increased during the year due to pension reform. During the year, the Texas legislature voted to approve a pension reform bill negotiated by the City of Houston and representatives of the employee retirement plans. Implementation of the pension reform measures also required voter approval in order for the City of Houston to issue pension obligation bonds. Voter approval was obtained and in December 2017 the plan received $750 million of pension obligation bond proceeds from the City of Houston.

HPOPS outperformed its benchmark rate of return by 0.5%, due primarily to its domestic equity allocation, both public and private. The public domestic equity portfolio is a passive allocation that can be leveraged within a range as established by the Board. The leverage utilized in the System's domestic equity portfolio allowed it to outperform its benchmark by approximately 1.7%. The System's private equity portfolio returned 23.4% outperforming the Cambridge Private Equity Index by 7.3%. In addition to the fundamentals driving the global economy, private equity also benefitted from continued cheap financing, high valuations and the need to deploy an abundance of capital.

Concerns surrounding the aging bull market and elevated equity valuations lead to the expansion of the System's fixed income allocation. During the year, the mandate to traditional investment grade government bonds was increased for the purpose of downside protection. The increased fixed income allocation has primarily been funded through further reductions to the hedge fund and risk parity mandates. Both strategies have underperformed versus expectations and a catalyst to reverse this performance trend is not visible.

Domestic Equity

The U.S equity portfolio generated a 16.5% return, outperforming the 14.8% return of its benchmark, the Russell 3000. This outperformance of the System's domestic equity portfolio versus the benchmark was primarily due to the System's use of leverage within the Parametric U.S. Futures portfolio. During FY 2018 the Parametric U.S. Futures portfolio outperformed the Russell 3000 index by 1.7%.

Assets under management, annualized rates of return and fees paid to domestic equity managers for the fiscal year ending June 30, 2018 are as follows (dollars in 000's):

Manager	Style	Assets	% Returns	Fees
BlackRock	S&P 500 Index	$ 714,379	14.3%	$ 94
Northern Trust [1]	Russell 3000	205,609	-2.0%	18
Parametric [2]	Russell 3000 Futures	564,448	19.6%	404
		$ 1,484,436		$ 516

[1] Funded January 16, 2018, returns are not annualized.

[2] See footnote 4 to the finacial statements for disclosure of leverage in this strategy.

International Equity

The System's non-U.S. equity target allocation was increased during the year based on the view that the U.S. is later in the economic cycle versus developed international markets. While this view continues to be prevalent among many economists, returns have not supported this argument and the System began reducing this overweight subsequent to year end. The international equity portfolio returned 4.4%, underperforming the 7.3% return of the MSCI ACWI ex U.S. benchmark for the fiscal year. This performance was primarily attributed to the overweight to emerging markets and the impact of the System's currency hedge.

Assets under management, annualized rates of return and fees paid to international equity managers for the fiscal year ending June 30, 2018 are on the following page (dollars in 000's):

Manager	Style	Assets	% Returns	Fees
BlackRock	World Equity ex-US	$ 420,900	7.4%	$ 279
Parametric	World Equity ex-US Futures[1]	441,294	5.6%	302
Parametric	Currency Hedge	27,021	-3.6%	79
Northern Trust	World Equity ex-US [2]	118,412	-7.0%	28
Blackrock	Emerging Markets [3]	120,511	1.7%	78
		$ 1,128,138		$ 766

[1] See footnote 4 to the financial statements for disclosure of leverage in this strategy.

[2] Funded January 17, 2018, returns are not annualized.

[3] Funded September 27, 2017, returns are not annualized.

Credit

HPOPS has a dedicated allocation to credit strategies designed to take advantage of perceived opportunities in the credit markets. Credit investments are segregated by HPOPS as a separate investment category with a target allocation of 10.5% of the System's total assets.

The System has reduced its allocation to high yield within the credit category to 3.0% in favor of opportunistic strategies, as given where we are in the economic cycle, the structure of the illiquid credit funds appears more attractive. The opportunity set remains extensive due to reduced lending within the banking industry and we continue to believe that there is potential outperformance versus high yield resulting from the illiquidity premium. In addition, these illiquid funds should be less volatile than high yield while at the same time distributing current income.

Assets under management, annualized rates of return and fees paid to credit-oriented managers for the fiscal year ending June 30, 2018 are listed below (dollars in 000's):

Manager	Style	Assets	% Returns	Fees
MacKay Shields[1]	High Yield	$ 16	NA	$ -
Shenkman Capital Mgmt	High Yield	130,484	2.4%	519
Northern Trust	High Yield	61,874	4.2%	297
Golub BDC2[2]	Opportunistic Credit	5,500	6.7%	37
GSO Capital Opps III[2]	Opportunistic Credit	6,710	12.8%	97
Mesa West IV[2]	Opportunistic Credit	7,715	5.5%	375
OZ RE Credit[2]	Opportunistic Credit	3,658	14.1%	28
Silver Point[2]	Opportunistic Credit	26,104	8.0%	522
SP Speciality Credit[2]	Opportunistic Credit	30,040	14.2%	262
OZ Structured Products II[2]	Opportunistic Credit	12,489	35.1%	209
Golub X[2]	Opportunistic Credit	21,250	7.9%	220
Monroe Capital II[2]	Opportunistic Credit	21,631	9.8%	319
Monroe Capital III[2]	Opportunistic Credit	232	0.0%	50
Anchorage Illiquid III[2]	Opportunistic Credit	9,736	22.4%	371
Anchorage Illiquid V[2]	Opportunistic Credit	44,272	7.6%	554
		$ 381,711		$ 3,860

[1] Terminated May 30.2014

[2] Fees paid to Opportunistic Credit managers in this schedule are not explicitly paid by the System, but instead are deducted from assets by the managers. Thus, these fees are not included as a component of investment expense in the financial statements.

Fixed Income

The System has re-established a 6.0% target allocation to fixed income. Given the duration of the economic recovery, high valuations and geopolitical risks in the market, the System has implemented the fixed income portfolio for downside protection. Forecasted returns for the fixed income asset class remain low, therefore the System has diversified its fixed income allocation to include emerging market local currency debt and corporate debt.

Assets under management, annualized rates of return and fees paid to credit-oriented managers for the fiscal year ending June 30, 2018 are listed below (dollars in 000's):

Manager	Style	Assets	% Returns	Fees
Blackrock	BC US Aggregate	$ 357,447	-0.6%	$ 89
Parametric [1]	Local Currency Debt	71,050	-10.6%	10
Shenkman [2]	Short Duration	49,943	-0.2%	7
		$ 478,440		$ 106

[1] Funded March 5, 2018, returns are not annualized.

[2] Funded May 31, 2018, returns are not annualized.

Alternative Investments

The System's alternative investment program consists of allocations to private equity, energy assets, real estate, hedge funds, and risk parity strategies. The private equity program is now managed by Franklin Park, although the portfolio still contains funds recommended by Abbott Capital who managed the asset class from 1997 – 2008, as well as funds recommended by Mercer (formerly Hammond Associates) who served as the interim manager between Abbott Capital and Franklin Park. Although the private equity program is a relatively mature strategy, it remains underfunded by approximately 4.1% due primarily to the increased allocation to the asset class and also to distributions exceeding drawdowns in recent years. The System had investments in, or commitments to, 102 individual private equity and energy partnerships with 56 general partners as of June 30, 2018. The current allocation within this strategy is approximately 50% leveraged buyouts, 16% special situation funds, 3% venture capital, 11% secondary and 21% in energy funds. This program required $123.6 million of additional funding during fiscal 2018 while at the same time generating distributions of $114.8 million for the same period. The private equity program generated a 23.4% return for the 2018 fiscal year versus a return of 16.1% for its benchmark, the Cambridge Private Equity Index. The System's energy allocation returned 13.3%, underperforming its benchmark, the S&P 500 Energy Index by 7.6%. This underperformance of the energy portfolio is due to the valuation methodology of the illiquid funds, which do not immediately reflect the trends in the public market and are less correlated.

$ millions

Strategy	Number of Funds	Committed Capital	Contributed Capital	Unfunded Commitment	Distributed Capital	Remaining Value	Exposure	TVPI	Net IRR
Buyout	51	708	554	223	487	399	623	1.60	17.6%
Debt for Control	1	10	4	-	2	0	0	0.46	-28.8%
Distressed Debt	2	35	33	2	22	25	27	1.42	9.9%
Energy	16	270	222	72	119	154	226	1.23	9.4%
Growth Equity	7	60	60	0	69	17	18	1.43	9.6%
Mezzanine	1	2	2	0	2	0	0	1.34	12.3%
Multi-Strategy	11	226	226	93	101	99	193	0.89	12.5%
Structured Finance	2	45	30	24	12	23	47	1.17	10.9%
Turnaround	3	45	37	12	19	26	37	1.19	8.4%
Venture Capital	8	46	45	1	56	7	8	1.39	4.9%
	102	1,447	1,212	428	887	751	1,178	1.35	11.1%

▫ Remaining Value is defined as the investor's value as reported by the fund's manager.
▫ Exposure is defined as the sum of an investor's Remaining Value plus Unfunded Commitment.
▫ TVPI is the ratio of Distributed Capital plus Remaining Value to Contributed Capital.
▫ Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, of fees and expenses, including late closing interest.
▫ Results include fully liquidated investments (if applicable).
▫ Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date.

As of June 30, 2018 the market value of real estate assets comprised 6.0% of the System's total assets. The 4.0% shortfall between the target allocation and the current allocation is due to the increased target allocation during 2015, in addition to the timing and relatively immature nature of the portfolio. The System began committing to the asset class during 2007, immediately prior to the great recession. During the recession, capital was not called due to extreme market uncertainty, essentially delaying investment into the asset class for approximately two years. The System had investments in, or commitments to, 32 individual real estate partnerships with 19 general partners as of June 30, 2018. This program required $65.3 million of additional funding during fiscal 2018 while at the same time generating distributions of $62.6 million for the same period. The System's real estate portfolio returned 12.8% during fiscal year 2018, outperforming its benchmark the NCREIF Property Index by 5.7%.

$ millions

Strategy	Number of Funds	Committed Capital	Contributed Capital	Unfunded Commitment	Distributed Capital	Remaining Value	Exposure	TVPI	Net IRR
European Diversified	1	25	10	15	0	12	27	1.19	18.4%
Global Distressed Real Estate Debt	3	63	35	28	21	26	55	1.36	14.6%
Global Diversified	12	225	118	124	77	96	220	1.47	16.5%
US Diversified	9	245	149	105	35	158	263	1.29	9.8%
US Multi-Family	2	45	14	31	17	4	36	1.52	11.0%
US Office	1	10	8	2	11	1	3	1.66	17.7%
US Real Estate Debt	3	70	48	22	26	37	59	1.32	7.7%
US Hospitality	1	35	-	35	-	-	35	na	na
	32	718	380	363	188	334	696	1.37	11.6%

- Remaining Value is defined as the investor's value as reported by the fund's manager.
- Exposure is defined as the sum of an investor's Remaining Value plus Unfunded Commitment.
- TVPI is the ratio of Distributed Capital plus Remaining Value to Contributed Capital.
- Net IRR is defined as the annualized, compound rate of return using daily draws, distributions and Remaining Value as of the Report Date, of fees and expenses, including late closing interest.
- Results include fully liquidated investments (if applicable).
- Commitments made in a foreign currency have been converted into U.S. dollars using an exchange rate as of the Report Date.

The target hedge fund allocation is now 8.5% and the System had $373.7 million invested as of June 30, 2018. Hedge funds generated fiscal year performance of approximately 8.4%, outperforming the HFR Fund of Funds Composite Index by 3.2%. Hedge fund performance benefited this year from rising global equity markets, low cost financing, and recovering commodity markets.

The System reduced its allocation to risk parity to 7.3% during the year. Risk parity funds underperformed their benchmark, a 60% S&P 500 / 40% BC US Aggregate mix, by returning 3.9% versus an 8.3% return for the benchmark.

Assets under management, annualized rates of return and fees paid to alternative investments managers for the fiscal year ending June 30, 2018 are listed on the following page (dollars in 000's):

Manager	Style	Assets	% Returns	Base Fee
Bridgewater	Risk Parity[1]	$ 109,647	2.3%	$ 2,017
AQR	Risk Parity[1,2]	264,080	5.0%	2,992
Bridgewater	Hedge Funds[3]	224,026	8.8%	3,801
Mercer	Hedge Funds[4]	2,818	NA	-
Blackstone Opportunistic	Hedge Fund [7]	6,061	4.3%	77
Parametric Defensive	Option Trading	58,430	-0.6%	767
Mercer	Real Estate[5]	333,686	12.8%	412
Franklin Park	Private Equity[6]	596,451	23.4%	400
Franklin Park	Energy	154,462	13.3%	-
Elliott	Hedge Fund [7]	112,453	8.1%	1,628
King Street	Hedge Fund [7]	22,990	3.6%	340
Viking	Hedge Fund [7]	25,285	10.0%	368
		$1,910,389		$ 12,802

[1] Risk parity plus alpha overlay.

[2] Includes the Multi Strategy Fund VIII and the Multi Strategy Fund XI.

[3] Includes the Pure Alpha and Pure Alpha Major Markets funds.

[4] Residual Illiquid Investments from hedge funds terminated between 2010-2016.

[5] Fees consist of the Mercer $412 thousand annual consulting fee.

[6] Fees consist of the $400 thousand annual consulting fee.

[7] Management fees paid to Blackstone, Elliott, King Street and Viking are deducted directly from the assets of each fund and are not a component of investment expense in the financial statements.

Cash

The System has a cash securitization program which was initiated in order to more closely track our strategic asset allocation through the securitization of excess cash. During September 2008, the System switched to a "government only" STIF fund at its custodian bank, thereby avoiding many of the liquidity issues experienced by many STIF funds during the credit crisis.

Manager	Style	Assets (000s)	% Returns	Base Fee (000s)
Parametric	Cash Securitization[1]	$ 95,959	9.8%	$ 68
		$ 95,959		$ 68

[1] As of June 30, 2018 cash balances were securitized with 27.5% Domestic Equity exposure, 22.5% International Equity exposure and 50% unsecuritized cash.

Securities Lending

The System's master custodian, Northern Trust, operates the Securities Lending program on behalf of HPOPS. Securities are loaned on a short-term basis to brokers in exchange for (generally) cash collateral. Northern Trust then invests this collateral and the investment income is divided between HPOPS and Northern Trust in accordance with agreed-upon percentages.

This program generates incremental income for HPOPS but is subject to certain risks. These risks include (1) the possibility that the borrower cannot return the securities and (2) that the investments in which Northern invests the collateral lose money. This first risk is controlled by strict guidelines on which borrowers will be approved to participate in the program and daily adjustment of the collateral for changes in the market value of the securities that are out on loan. The second risk is controlled by strict quality and duration guidelines on the securities that the collateral can be invested in. In June 2008 the System switched to a "government only" collateral pool thus avoiding exposure to the liquidity issues experienced by many securities lending collateral pools during the credit crisis.

Vendors other than Northern Trust could be used for this program which could generate additional income but this is not likely without what has been determined to be an unacceptable increase in risk. Northern's participation in the Securities Lending program also allows for a reduction in custody fees.

Following is a chart of securities lending activity for the most recent three fiscal years (dollars in 000's).

	2018	2017	2016
Avg Securities on Loan	$ 74,931	$ 76,975	$ 76,158
Avg Eligible Securities	$ 415,198	$ 486,561	$ 543,467
% on Loan	18.0%	15.8%	14.0%
HPOPS Net Earnings	$ 279	$ 305	$ 185
Duration of Collateral Pool (days)	25	30	33

Report Preparation

This report was prepared by the Investment Department of the Houston Police Officers' Pension System.

Compound Annualized Rates of Return by Year (%)
Periods Ended June 30, 2018

Year	System Total	Composite Benchmark	Domestic Equity	Russell 3000	Int'l Equity	MSCI ACWI ex U.S.	Credit	FTSE HY Market TR	Alternative Investments
2	13.4	11.9	19.3	16.6	12.9	13.7	10.1	7.5	12.6
3	7.6	7.6	13.6	11.6	3.3	5.1	6.1	5.2	7.7
5	8.1	8.5	13.6	13.3	5.3	6.0	6.8	5.2	8.6
10	6.3	6.2	9.1	10.2	2.6	2.5	8.7	7.8	7.1

*The System did not have an allocation to fixed income during fiscal years 2014 – 2017 and only had a fixed income allocation for the final six months of fiscal 2018. For this reason, no annualized returns for fixed income are included in the schedule above as such returns would be misleading.

Rates of Return by Year (%)
Years Ended June 30th

Year	System Total	Composite Benchmark	Domestic Equity	Russell 3000	Int'l Equity	MSCI ACWI ex U.S.	Credit	Citigroup HY	Alternative Investments
2013	7.9	12.1	21.5	21.5	11.9	13.6	13.4	9.2	4.1
2014	17.4	18.7	25.2	24.9	20.5	21.8	13.5	11.3	18.5
2015	0.8	3.1	3.2	7.3	-2.5	-5.3	2.4	-0.9	1.9
2016	-3.1	-0.6	3.1	2.1	-13.4	-10.2	-1.5	0.9	-1.4
2017	16.8	14.1	22.2	18.5	22.0	20.5	12.7	12.3	12.6

These calculations were prepared using a time-weighted rate of return in accordance with The CFA Institute's Global Investment Performance Standards. The System's total rates of return are net of fees. All other rates of return are presented gross of fees. Though these standards do not apply to plan sponsors per se, we have used them herein for purposes of presenting investment rates of return. The Composite Benchmark returns are calculated as if the System's current asset allocation had been in place for all time periods.

Schedule of Ten Largest Equity Holdings

As of June 30, 2018

Shares	Description	Market Value ($000's)	% of Total Equity
726,836	Blackrock Equity Index Fd	$ 714,379	27.34%
15,204,360	Blackrock ACWI Ex-Us Superfund A	420,900	16.11%
5,098,422	Northern Trust Collective Russell 3000 Index Fund	205,609	7.87%
2,382,608	Blackrock MSCI Emerging Markets Index Fund	120,511	4.61%
704,055	Northern Trust Collective MSCI ACWI Ex-US Index Fund	118,412	4.53%
279	Futures Sep 18 ME S&P CAN 60	40,862	1.56%
11,701	Zafgen Inc.	120	0.00%
1,600	Benefitfocus Inc.	54	0.00%
409	Quad/Graphics Inc.	9	0.00%
32	Lear Corp.	6	0.00%

A complete list of all individual holdings is available upon request.

Schedule of Equity Trading Brokerage Commissions Paid

For the year ended June 30, 2018

Brokers	Shares	Commissions	Principle	Commissions Per Share
Goldman Sachs	17,677,802	$ 43,248	$ 129,158,802	$ 0.002

Schedule of Ten Largest Fixed Income Holdings

As of June 30, 2018

Shares	Description	Market Value ($000's)	% of Total Fixed Income
1,871,573	NTGI COLTV Daily Hi Yield Fxd Inc Fd	$ 61,874	7.19%
1,595,000	Davita Inc. 5.75% due 8/15/2022	1,622	0.19%
1,465,000	Boyd Gaming Corp. 6.875% due 5/15/2023	1,535	0.18%
1,395,000	Dynegy Inc. New Del 7.375% due 11/1/2022	1,458	0.17%
1,350,000	Lin T.V. Corp. 5.875% due 11/15/2022	1,377	0.16%
1,200,000	HCA Inc. 7.5% due 2/15/2022	1,305	0.15%
1,225,000	Berry Global Inc. 6.0% due 10/15/2022	1,261	0.15%
1,200,000	Aragh Packaging 6.0% due 6/30/2021	1,214	0.14%
1,150,000	Pvtpl First Data Corp. Bonds 144A 7.0 % due 12/1/2023	1,198	0.14%
1,100,000	Covanta Holding Corp. 6.375% due 10/1/2022	1,123	0.13%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SECTION FOUR

ACTUARIAL SECTION

Houston Police Officers' Pension System

ACTUARIAL VALUATION REPORT FOR THE YEAR BEGINNING JULY 1, 2018

P: 469.524.0000 | F: 469.524.0003 | www.grsconsulting.com

November 28, 2018

Board of Trustees
Houston Police Officers' Pension System
602 Sawyer
Suite 300
Houston, TX 77007

Re: Risk Sharing Valuation Study as of July 1, 2018

Dear Members of the Board:

We are pleased to present our Risk Sharing Valuation Study (RSVS, or sometimes referred to as the actuarial valuation in the report) of the Houston Police Officers' Pension System ("HPOPS" or "the System") for the plan year commencing July 1, 2018. This Report describes the current actuarial condition of HPOPS, determines the calculated employer contribution rate (the actuarially determined rate), and analyzes changes in this contribution rate from the prior year. Valuations are prepared annually, as of July 1st, the first day of the HPOPS' plan year. This report was prepared at the request of the Board and is intended for use by the HPOPS staff and those designated or approved by the Board. This report may be provided to parties other than HPOPS staff only in its entirety and only with the permission of the Board, or as required by law.

Financing objectives and funding policy

Under the HPOPS statute, the employer contribution rate is determined actuarially, based on the Board's funding policy and HPOPS' governing law. The contribution rate determined by a given actuarial valuation and implemented by the Board becomes effective twelve months after the valuation date, i.e., the rates determined by this July 1, 2018 actuarial valuation will be used by the Board when determining the employer contribution rate for the year beginning July 1, 2019 and ending June 30, 2020.

While inside the RSVS Corridor, the actual City Contribution Rate will be the greater of the Estimated City Contribution Rate determined below and the Corridor Midpoint that was established in the June 30, 2016 RSVS. The Estimated City Contribution Rate (City of Houston) for FY 2020 is 31.58%, which is less than the Corridor Midpoint of 31.82%, thus the City Contribution rate for FY2020 is 31.82%.

The Estimated City Contribution Rate and liabilities are computed using the Ultimate Entry Age Normal (UEAN) actuarial cost method. The Estimated City Contribution Rate is the sum of two pieces: the employer normal cost rate and the amortization rate. The normal cost rate is determined as a percentage of active member payroll, with the employer normal cost being the difference between the total normal cost and the member contribution rate. The amortization rate is determined as a level percentage of active member payroll. It is the amount required to amortize the unfunded actuarial accrued liability (UAAL) over a closed period using the process of "laddering".

5605 North MacArthur Boulevard | Suite 870 | Irving, Texas 75038-2631

The UAAL as of June 30, 2016, as restated in the "Final Risk Sharing Valuation Study as of June 30, 2016" (RSVS Study), which was dated September 28, 2017, is the initial base and is amortized over a closed 30-year period beginning FY2018. Each future valuation will establish either a liability gain layer or a liability loss layer. These layers will represent unexpected increases/decreases in the unfunded actuarial accrued liability (after subtracting out any remaining Legacy Liability or any remaining prior years' liability layers). New loss bases will be amortized over a 30-year period, while new gain bases will be amortized over the remaining amortization period as of one year after the valuation date of the largest remaining loss base (will typically be the initial RSVS base). The amortization of all bases will begin one year after the valuation date using a level percentage of payroll amortization method. Note that in the prior valuation, the AVA was increased by the present value of an expected $750 million in Pension Obligation Bonds (POB), discounted from January 1, 2018 at 7.00%. The proceeds from the POB issuance are reflected in the employer contribution for the year ending June 30, 2018, so the beginning of year actuarial value of assets has been adjusted in the calculations in tables 10 through 12 of Section IV to exclude the adjustment made in the prior valuation.

Gains from assets returning 9.46% on an AVA basis compared to the 7.00% assumed were largely offset by payroll growth lower than assumed, an upcoming cost of living adjustment (COLA) greater than assumed, and a liability loss due to several factors including fewer retiree deaths than expected. Note that the calculation of the COLA (return on AVA less 5.0% with a minimum of 0.0% and max of 4.0%) means that gains due to asset performance will necessarily result in liability losses due to COLAs being greater than assumed, while asset losses will result in liability gains from COLAs being less than assumed. The impact of the COLAs being different than assumed will be larger in magnitude once the Plan is outside the three-year COLA holiday. Please see Table 6 under Section IV of our Report for a detailed analysis of the change in the estimated City contribution rate from the prior year to this year.

The contribution rate is determined using an actuarial value of assets rather than market value. The actuarial value of assets recognizes 20% of the difference (typically referred to as "five year smoothing") between the market value of assets and the expected actuarial value of assets, based upon the assumed valuation rate of return of 7.00% per annum. There are currently $357.8 million in asset gains being deferred that will be recognized in the future and will provide some help with improvement in the funded status absent future asset losses.

Progress toward realization of financing objectives

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches 100%. The funded ratio as of July 1, 2018 is 79.3% which is up compared to last year's funded ratio of 78.3%. The funded ratio measured on the market value of assets is higher at 84.9% as of July 1, 2018. The funded status alone may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Benefit provisions

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2018. There were no changes in the benefit provisions since the prior valuation. The benefit provisions are summarized in Appendix B of our Report.

Actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the System's actuary. As part of the legislation enacting the 2016 RSVS benefit changes, the investment return assumption (7.0%) was set into statute (Article 6243g-4, Vernon's Texas Civil Statutes). This assumption is now considered a prescribed assumption under the actuarial standards of practice. The assumptions used in this valuation were adopted by the Board based on the recommendations from GRS following the Actuarial Experience Investigation Study for the 5-year period ending June 30, 2017. These assumptions were first used in the current actuarial valuation. Changes from the experience study included updating the mortality tables, minor changes to the retirement rates, and adjustments to the disability rates. See Section III of this report for a more detailed summary of changes.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. The actuarial calculations presented in our Report are intended to provide information for rational decision making.

The actuarial assumptions and methods used in this Report all comply with the actuarial standards of practice (ASOPs)and are described in Appendix A of our Report.

Data

Member data for retired, active and inactive members was supplied as of July 1, 2018 by the HPOPS staff. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us.

Asset and all financial information as of July 1, 2018 were supplied to us by the HPOPS staff.

Plan Experience

As part of each valuation, we examine the System's experience relative to the assumptions. The aggregate results of these analyses are disclosed in Tables 5 & 6 under Section IV of our Report.

November 28, 2018

All of the tables contained in this actuarial valuation report and in the actuarial section of the HPOPS Comprehensive Annual Financial Report (CAFR) were prepared by Gabriel, Roeder, Smith & Company. Historical information for years prior to 2008 was prepared by the prior actuarial firm and was not subjected to our actuarial review. We certify that the information presented herein is accurate and fairly portrays the actuarial position of HPOPS as of July 1, 2018.

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of State law and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. All of the undersigned are Enrolled Actuaries, Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

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EXECUTIVE SUMMARY

Item	July 1, 2018 After Changes	July 1, 2018 Before Changes	July 1, 2017
Membership (dollar amounts in thousands)			
• Number of:			
- Active members	5,226	5,226	5,164
- Retirees and beneficiaries	4,367	4,367	4,247
- Inactive members	29	29	26
- Total	9,622	9,622	9,437
• Total annualized salaries supplied by HPOPS	$ 426,662	$ 426,662	$ 406,151
Contribution Rates			
• City Contribution Rate	31.82%	31.82%	31.85%
• Member	10.50%	10.50%	10.50%
Assets ($000s)			
• Market value	$ 5,486,613	$ 5,486,613	$ 4,457,178
• Actuarial value	5,128,835	5,128,835	4,868,614
• Estimation of return on market value	9.8%	9.8%	17.0%
• Estimation of return on actuarial value	9.5%	9.5%	9.0%
• Employer contribution	$ 887,143	$ 887,143	$ 133,805
• Member contribution	$ 45,254	$ 45,254	$ 40,104
• Ratio of actuarial value to market value (prior to recognition of POB for July 1, 2017)	93.5%	93.5%	93.0%
Actuarial Information ($000s)			
• Employer normal cost %	13.51%	13.72%	13.85%
• Unfunded actuarial accrued liability (UAAL)	$ 1,335,037	$ 1,316,405	$ 1,349,679
• Amortization rate	18.07%	17.80%	17.89%
• Funding period	29.0 years	29.0 years	30.0 years
• Funded ratio	79.3%	79.6%	78.3%
Projected employer contribution			
• Fiscal year ending June 30,	2020	2020	2019
• Projected payroll (millions)	$ 450.5	$ 450.5	$ 452.7
• Projected employer contribution (millions)	$ 143.3	$ 143.3	$ 144.2

HISTORICAL SOLVENCY TEST ($000)
TABLE 14

	Aggregated Accrued Liabilities for				by Reported Assets		
Valuation Date	Active Members Contributions	Retirees Beneficiaries and Vested Terminations[1]	Members (City Financed Portion)	Actuarial Value of Assets	(5)/(2)	[(5)-(2)]/(3)	[(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
July 1, 1999	107,008	1,157,882	508,939	1,746,312	100%	100%	95%
July 1, 2000	111,099	1,324,079	531,225	2,013,491	100%	100%	100%
July 1, 2001	138,248	707,152	1,461,027	2,226,307	100%	100%	95%
July 1, 2002	145,255	718,779	1,729,696	2,337,157	100%	100%	85%
July 1, 2003	153,634	838,090	1,883,014	2,394,411	100%	100%	74%
July 1, 2004	153,088	995,841	2,190,295	2,466,070	100%	100%	60%
July 1, 2005	249,804	1,259,243	1,883,927	2,508,794	100%	100%	53%
July 1, 2006	262,514	1,421,330	1,949,301	2,681,375	100%	100%	51%
July 1, 2007	275,990	1,575,900	2,005,790	3,004,927	100%	100%	57%
July 1, 2008	294,678	1,726,121	2,058,165	3,337,612	100%	100%	64%
July 1, 2009	312,489	1,872,226	2,183,786	3,430,946	100%	100%	57%
July 1, 2010	149,252	1,998,683	2,084,797	3,526,703	100%	100%	66%
July 1, 2011	160,828	2,146,222	2,181,093	3,718,052	100%	100%	65%
July 1, 2012	167,739	2,320,239	2,259,195	3,888,504	100%	100%	62%
July 1, 2013	163,660	2,501,745	2,344,556	4,070,951	100%	100%	60%
July 1, 2014	162,982	2,834,747	2,366,263	4,342,936	100%	100%	57%
July 1, 2015	157,344	3,131,654	2,417,132	4,550,620	100%	100%	52%
July 1, 2016	151,259	3,381,371	2,548,761	4,758,079	100%	100%	48%
July 1, 2017	158,648	3,812,704	2,246,942	4,868,614	100%	100%	40%
July 1, 2018	166,807	4,033,323	2,263,742	5,128,835	100%	100%	41%

Note: Dollar amounts in $000

[1] Column (3) included AAL for DROP participants until 2000, now in Column (4)

SCHEDULE OF FUNDING PROGRESS ($000)
TABLE 15

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
July 1, 1999 *	1,746,312	1,773,829	27,517	98.4%	246,569	11.2%
July 1, 2000	2,013,491	1,966,404	(47,087)	102.4%	250,691	(18.8%)
July 1, 2001	2,226,307	2,306,427	80,120	96.5%	264,226	30.3%
July 1, 2002	2,337,157	2,593,730	256,573	90.1%	286,150	89.7%
July 1, 2003	2,394,411	2,874,738	480,327	83.3%	300,405	159.9%
July 1, 2004	2,466,070	3,339,224	873,154	73.9%	329,840	264.7%
July 1, 2005	2,508,794	3,392,974	884,180	73.9%	321,057	275.4%
July 1, 2006	2,681,375	3,633,145	951,770	73.8%	327,080	291.0%
July 1, 2007	3,004,927	3,857,680	852,753	77.9%	336,029	253.8%
July 1, 2008	3,337,612	4,078,963	741,351	81.8%	351,525	210.9%
July 1, 2009	3,430,946	4,368,501	937,556	78.5%	366,924	255.5%
July 1, 2010**	3,526,703	4,232,732	706,029	83.3%	377,779	186.9%
July 1, 2011	3,718,052	4,488,142	770,090	82.8%	388,409	198.3%
July 1, 2012	3,888,504	4,747,173	858,669	81.9%	389,884	220.2%
July 1, 2013	4,070,951	5,009,961	939,010	81.3%	391,957	239.6%
July 1, 2014	4,342,936	5,363,992	1,021,056	81.0%	399,447	255.6%
July 1, 2015	4,550,620	5,706,130	1,155,510	79.7%	406,233	284.4%
July 1, 2016***	4,758,079	6,081,392	1,323,313	78.2%	424,300	311.9%
July 1, 2017	4,868,614	6,218,293	1,349,679	78.3%	440,614	306.3%
July 1, 2018	5,128,835	6,463,872	1,335,037	79.3%	438,396	304.5%

* Definition of covered payroll changed from base pay to total direct pay less overtime
** Change to Projected Unit Credit cost method. Prior results were provided based on Entry Age Normal.
*** Change to Ultimate Entry Age Normal cost method and benefit changes to all groups.

HISTORICAL ACTIVE PARTICIPANT DATA
TABLE 17

Valuation Date	Active Count	Average Age	Average Svc	Covered Payroll	Average Salary	Percent Changes
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1990	4,073	36.2	N/A	$126,665[(1)]	$31,099	4.0%
1992	4,120	36.8	N/A	$143,020	$34,714	11.6%
1993	4,498	36.7	N/A	$159,321	$35,420	2.0%
1994	4,705	36.8	N/A	$162,143	$34,462	-2.7%
1995	4,921	36.9	N/A	$174,761	$35,513	3.0%
1996[(2)]	4,395	35.1	N/A	$150,903	$34,335	-3.3%
1997	4,282	35.5	N/A	$149,631	$34,944	1.8%
1998	4,247	35.9	N/A	$153,479	$36,138	3.4%
1999	4,253	36.3	N/A	$187,967[(3)]	$44,196[(3)]	22.3%[(3)]
2000	4,137	36.7	N/A	$179,415	$43,368	-1.9%
2001[(4)]	5,325	40.2	N/A	$264,226[(5)]	$49,620[(5)]	14.4%[(5)]
2002	5,352	40.7	N/A	$286,150	$53,466	7.8%
2003	5,387	41.3	N/A	$300,405	$55,765	4.3%
2004	5,225	41.7	N/A	$329,840	$63,127	13.2%
2005	4,867	42.0	N/A	$321,057[(6)]	$65,966[(6)]	4.5%[(6)]
2006	4,785	42.3	N/A	$327,080	$68,355	3.6%
2007	4,879	42.1	N/A	$336,029	$68,873	0.8%
2008	5,065	42.0	15.7	$351,525	$69,403	0.8%
2009	5,245	41.8	15.4	$366,924	$69,957	0.8%
2010	5,347	41.9	15.3	$377,779	$70,652	1.0%
2011	5,312	42.3	15.7	$388,409	$73,119	3.5%
2012	5,326	42.5	15.7	$389,884	$73,204	0.1%
2013	5,364	42.6	15.7	$391,957	$73,072	-0.2%
2014	5,343	42.6	15.7	$399,447	$74,761	2.3%
2015	5,261	42.8	15.9	$406,233	$77,216	3.3%
2016	5,261	42.6	15.7	$418,252	$79,500	3.0%
2017	5,164	41.7	14.5	$417,320	$80,813	1.7%
2018	5,226	41.6	14.4	$438,396	$83,887	3.8%

(1) Reflects the November 1, 1990 pay increase.
(2) For the July 1, 1996 to July 1, 2000 valuations, includes those participants currently accruing benefits (i.e.
(3) Definition of covered payroll changed from base pay to total direct pay less overtime.
(4) Beginning July 1, 2001, includes active participants eligible for DROP.
(5) Beginning July 1, 2001, the definition of total direct pay changed from the average of the last 26 pay periods to
(6) Beginning October 9, 2004, pensionable pay is the total of the last 26 pay periods, excluding CMEPP and SOSP.

RETIREES, BENEFICIARIES, AND DISABLED PARTICIPANTS ADDED TO AND REMOVED FROM ROLLS
TABLE 18

	Added to Rolls		Removed from Rolls		Rolls-End of Year			
Valuation July 1,	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances	% Increase in Annual Allowances	Average Annual Allowances
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1995	893	$ 19,109	36	$ 602	2,335	$ 48,624	65.0%	$ 20,824
1996 *	182	3,481	29	618	2,488	52,772	8.5%	21,211
1998	159	3,483	28	589	2,619	63,957	21.2%	24,420
1999	150	3,770	46	1,001	2,723	70,432	10.1%	25,866
2000	233	6,421	36	857	2,920	76,401	8.5%	26,165
2001 **	131	3,755	1,250	33,892	1,801	54,006	(29.3%)	29,987
2002	104	2,809	46	1,113	1,859	55,013	1.9%	29,593
2003	106	2,967	47	1,109	1,918	61,531	11.8%	32,081
2004	220	9,172	33	1,014	2,105	70,307	14.3%	33,400
2005	353	15,962	55	1,776	2,403	86,933	23.6%	36,177
2006	254	10,195	66	2,197	2,549	96,812	11.4%	37,980
2007	175	8,056	49	1,809	2,717	105,481	9.0%	38,823
2008	149	11,889	57	1,995	2,809	115,375	9.4%	41,073
2009	154	9,639	63	2,275	2,900	122,738	6.4%	42,324
2010	165	8,891	56	2,355	3,009	129,274	5.3%	42,963
2011	171	10,567	59	2,218	3,121	137,623	6.5%	44,096
2012	180	11,934	71	2,820	3,230	146,737	6.6%	45,429
2013	183	11,674	64	2,345	3,349	156,066	6.4%	46,601
2014	217	13,857	63	2,627	3,503	167,296	7.2%	47,758
2015	288	16,132	65	2,762	3,726	180,666	8.0%	48,488
2016	259	16,357	77	3,291	3,908	193,733	7.2%	49,573
2017	460	26,911	95	4,139	4,273	216,505	11.8%	50,668
2018	221	14,138	98	4,370	4,396	226,273	4.5%	51,473

* From June 30, 1996 through June 30, 2001 includes DROP participants.
** Beginning July 1, 2001 excludes active participants eligible for DROP.

Note: Dollar amounts in $000

MEMBERSHIP DATA
TABLE 19

	July 1, 2018 (1)	July 1, 2017 (2)	July 1, 2016 (3)
1. Active members			
a. Number	5,226	5,164	5,261
b. Number in DROP	1,795	1,797	2,057
c. Total payroll	$ 438,395,640	$ 417,319,737	$ 418,251,694
Payroll in DROP	$ 177,140,744	$ 171,696,722	$ 191,140,953
d. Average salary	83,887	80,813	79,500
e. Average age	41.6	41.7	42.6
f. Average service	14.4	14.5	15.7
2. Inactive participants			
a. Vested	29	26	32
b. Total annual benefits (deferred)	$ 758,742	$ 713,631	$ 785,324
c. Average annual benefit	26,164	27,447	24,541
3. Service retirees			
a. Number	3,425	3,322	3,002
b. Total annual benefits	$ 184,074,752	$ 175,653,532	$ 155,529,585
c. Average annual benefit	53,744	52,876	51,809
d. Average age	65.0	64.7	64.8
4. Disabled retirees			
a. Number	169	166	161
b. Total annual benefits	$ 7,858,761	$ 7,509,663	$ 7,221,166
c. Average annual benefit	46,502	45,239	44,852
d. Average age	57.0	56.5	56.0
5. Beneficiaries and spouses			
a. Number	773	759	713
b. Total annual benefits	$ 33,580,922	$ 32,628,199	$ 30,196,684
c. Average annual benefit	43,442	42,988	42,352
d. Average age	69.3	69.2	69.0

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

The following methods and assumptions were used in preparing the July 1, 2018 actuarial valuation report.

1. Valuation Date

   The valuation date is as of July 1^{st}, the first day of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

2. Actuarial Cost Method

   The Ultimate Entry Age Normal (UEAN) actuarial cost method allocates the System's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. Under UEAN, the normal cost calculation is done assuming all members earn benefits that would be applicable to a newly hired member so that the normal cost should remain fairly stable as the relative distribution of active employees in different benefit groups changes. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

   An unfunded accrued liability exists in the amount equal to the excess of accrued liability over valuation assets. The amortization period of the System is the number of years required to fully amortize the unfunded accrued liability, on an actuarial value of asset basis, with the expected amount of employer contributions in excess of the employers' portion of the normal cost.

   The contribution rate determined by this valuation will not be effective until one year later, but the determination of the rate does not reflect this deferral. It is assumed that there will be no change in the employer normal cost rate due to the deferral, and it is assumed that payments are made uniformly throughout the year.

3. Actuarial Value of Assets

   The actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual market value and the expected actuarial value of assets each year, and recognizes the cumulative excess return (or shortfall) over at a minimum rate of 20% per year. Each year a base is set up to reflect this difference. If the current year's base is of opposite sign to the deferred bases then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base (5 less the number of years between the bases year and the valuation year). This is intended to ensure the smoothed value of assets will converge towards the market value in a reasonable amount of time. Expected earnings are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of investment expenses.

   The actuarial value of assets was set equal to the market value of assets as of July 1, 2016.

4. Economic Assumptions

a. Investment return: 7.00% per year, compounded annually, composed of an assumed 2.75% inflation rate and a 4.25% net real rate of return. This rate represents the assumed return, net of all investment expenses.

b. Cost of Living Adjustment (COLA): Monthly benefits for participants receiving payments are increased each April 1 by the five-year average investment return minus 5.00%, with a minimum of 0.00% and a maximum of 4.00%. For this valuation, the annual COLA is assumed to be 2.00%.

c. Salary increase rate: A service-related component, plus a 2.75% inflation and productivity component, as follows:

Years of Service	Service-related Component	Total Annual Rate of Increase Including 2.00% Inflation & Productivity Component
(1)	(2)	(3)
1	0.00%	2.75%
2	20.00%	22.75%
3	3.00%	5.75%
4	3.00%	5.75%
5	3.00%	5.75%
6	6.00%	8.75%
7	6.00%	8.75%
8	2.00%	4.75%
9	2.00%	4.75%
10	2.00%	4.75%
11	6.00%	8.75%
12	1.00%	3.75%
13	5.00%	7.75%
14	1.00%	3.75%
15	1.00%	3.75%
16	1.00%	3.75%
17	5.00%	7.75%
18 and Over	0.00%	2.75%

d. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 2.75% per year. This increase rate is solely due to the effect of inflation on salaries, with no allowance for future membership growth.

5. Demographic Assumptions

a. Retirement Rates

	Service		
Age	<25	25 - 29	30+
40-49	3.0%	3.0%	9.0%
50-54	4.0%	6.0%	10.0%
55-59	6.8%	10.2%	17.0%
60-64	9.6%	14.4%	24.0%
65 +	100.0%	100.0%	100.0%

For members hired after October 9, 2004, 3% per year the member's first retirement eligibility exceeds 45 is added to the retirement rate at first eligibility up to a maximum increase of 30% at age 55. For members in DROP as of July 1, 2016, retirement rates are multiplied by 110% to reflect that future employee contributions are no longer credited to the DROP balance.

b. DROP Participation

100% of eligible active participants are assumed to elect the DROP.

c. DROP Entry Date

Active members (not already in DROP) are assumed to take advantage of the DROP and enter when first eligible. Participants are assumed to elect the maximum duration for the back DROP, up to 20 years.

d. DROP Interest Credit

Interest in the amount of 65% of the five-year average investment return, with a minimum of 2.50%, will be credited to existing DROP accounts on a monthly basis. For this actuarial valuation, the drop interest credit is assumed to be 5.10%.

e. Withdrawal of DROP and PROP Balances

Members are assumed to withdraw balances in equal annual installments over 10 years.

f. Mortality rates (for active and retired members)

- Healthy retirees - The Gender-distinct RP-2014 Healthy Annuitant Mortality Tables with Blue Collar Adjustment for Males and no collar adjustment for Females. The rates are projected from the 2006 central rates to the valuation year using scale MP-2017, and thereafter on a fully generational basis by the ultimate values of scale MP-2014 to account for future mortality improvements.

- Disabled males and females – The Gender-distinct RP-2014 Disabled Retiree Mortality Tables are used without adjustment. The rates are projected on a fully generational basis by the ultimate values of scale MP-2014 to account for future mortality improvements.

- Active members - The Gender-distinct RP-2014 Employee Mortality Tables with Blue Collar Adjustment. The rates are projected on a fully generational basis by the ultimate values of scale MP-2014 to account for future mortality improvements.

Sample rates are shown below for 2018:

Age	Healthy Retired Males	Healthy Retired Females	Disabled Males	Disabled Females	Healthy Active Males	Healthy Active Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
25	0.08%	0.03%	0.81%	0.23%	0.06%	0.02%
30	0.11%	0.07%	0.76%	0.29%	0.06%	0.02%
35	0.15%	0.12%	0.88%	0.38%	0.07%	0.03%
40	0.21%	0.17%	1.06%	0.52%	0.08%	0.04%
45	0.28%	0.22%	1.64%	0.87%	0.12%	0.07%
50	0.41%	0.27%	1.96%	1.14%	0.21%	0.12%
55	0.61%	0.38%	2.24%	1.39%	0.35%	0.18%
60	0.89%	0.58%	2.56%	1.63%	0.58%	0.26%
65	1.34%	0.85%	3.04%	2.00%	1.03%	0.40%
70	2.04%	1.31%	3.88%	2.71%	1.66%	0.67%
75	3.25%	2.16%	5.21%	3.94%	2.68%	1.13%
80	5.42%	3.69%	7.36%	5.86%	4.32%	1.90%

g. Termination Rates and Disability Rates

Termination rates (for causes other than death, disability or retirement) are a function of the member's service and are not applied after a member becomes eligible for a retirement benefit. Disability rates are age-based and not applied for members in the DROP or those members eligible to back DROP. All disabilities are assumed to be duty-related. Rates at selected ages and service levels are shown below.

Termination		
Service	Male	Female
1	2.71%	2.71%
3	1.95%	1.95%
5	1.40%	1.40%
7	1.01%	1.01%
9	0.72%	0.72%
11	0.52%	0.52%
13	0.37%	0.37%
15	0.27%	0.27%
17	0.19%	0.19%
19	0.14%	0.14%
20 +	0.10%	0.10%

Age Based Rates of Disability		
Age	Male	Female
20	0.1149%	0.1149%
25	0.1145%	0.1145%
30	0.1197%	0.1197%
35	0.1321%	0.1321%
40	0.1516%	0.1516%
45	0.1785%	0.1785%
50	0.2126%	0.2126%
55	0.2538%	0.2538%
60	0.3023%	0.3023%

1% is also added to the rates above during the period that members hired post-2004 would have been eligible to retire under pre-2004 retirement eligibilities, but are not yet eligible.

6. Other Assumptions

a. Percent married: 90% of employees are assumed to be married. (No beneficiaries other than the spouse assumed.)

b. Valuation payroll: To determine the amortization rate, the payroll used is the amount budgeted by the City for the fiscal year following the valuation date increased by one year of payroll growth.

c. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

d. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.

e. Percent electing deferred termination benefit: 50% of vested terminating members are assumed to elect a refund rather than take a deferred benefit at age 60.

f. There will be no recoveries once disabled.

g. No surviving spouse will remarry.

h. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.

i. Administrative expenses: Administrative expenses are accounted for as an explicit component on the normal cost rate.

j. Pay increase timing**:** Beginning of (fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

k. Decrement timing: Decrements of all types are assumed to occur mid-year.

l. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

m. Decrement relativity: Decrement rates are converted to probabilities in order to account for multiple decrements.

n. Incidence of Contributions**:** Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in our Report, and the actual payroll payable at the time contributions are made.

o. Benefit Service: All members are assumed to accrue one year of service each year**.** Exact fractional service is used to determine the amount of benefit payable.

7. Participant Data

Participant data was supplied in electronic files. There were separate files for (i) active members, (ii) inactive members, and (iii) members and beneficiaries receiving benefits.

The data for active members included birth date, gender, most recent hire date, salary paid during last fiscal year, hours worked by the employee, and employee contribution amounts. For retired members and beneficiaries, the data included date of birth, gender, amount of monthly benefit, and date of retirement. Also included was the member's Group and for members participating in DROP, their account balances and monthly DROP income.

All healthy and disabled retirees are assumed to have 100% joint and survivor annuities, prorated by the 90% marriage assumption and reflecting the three year spousal age differential described above. All beneficiaries are assumed to have life annuity only benefits.

Salary supplied for the current year was based on the earnings for the year preceding the valuation date. This salary was adjusted by the salary increase rate for one year.

In fiscal years when a 27th pay period occurs the individual pays for employees who were employed throughout the year will be adjusted by multiplying their reported pay by the ratio of 26/27. In years that have only 26 pay periods no adjustment would be needed.

Assumptions were made to correct for missing, bad, or inconsistent data. These had no material impact on the results presented.

SUMMARY OF PLAN PROVISIONS

Covered Members	All police officers sworn before September 1, 1975 are covered under Plan 1, except those who elected by December 31, 1981 to participate in Plan 3. All police officers sworn on or after September 1, 1975, but before September 1, 1981 are covered under Plan 2, except those who elected by December 31, 1981 to participate in Plan 3 and those Plan 1. All other police officers are covered by Plan 3, except those from Police Cadet Classes 70 and 71 who elected to pay additional contributions and transfer to Plan 1.
Final Compensation	
Prior to November 28, 1998	Monthly base salary paid to the participant in his/her last month of service. For any participant from a position held for less than 3 years, final compensation is the average monthly base salary for the 3 years prior to retirement.
After November 28, 1998 but prior to July 1, 2001	Monthly total direct pay less overtime paid to the participant in his/her last month of service. For any participant from a position held for less than 3 years, final compensation is the average monthly base pay for the 3 years prior to retirement plus the other current components of total direct pay.
After July 1, 2001 but prior to October 9, 2004	Highest biweekly pay period (excluding overtime) during the last 26 pay periods annualized. Amounts not paid on a biweekly basis are deducted from period paid. Annual amounts are divided by 26 and added to the highest pay period, including motorcycle allowances.
On or after October 9, 2004	Average of the last three years of compensation (excluding exempt time, overtime and strategic officer staffing pay). This average will be phased in beginning with the pay period ending after October 9, 2004 until the new definition is fully phased in after 78 pay periods.
Service Retirement	
Eligibility	
▸ Sworn prior to October 9, 2004	20 years of service.
▸ Sworn on or after October 9, 2004	The age at which the sum of age and years of service is at least 70 (Rule of 70).

Benefit

Prior to November 1, 1955	$75 per month plus $2 per month for each year of service in excess of 25 years.
After November 1, 1955 but prior to January 13, 1968	30% of final compensation plus 1 % of final compensation for each year of service in excess of 20 years.
After January 13, 1968 but prior to July 1, 1986	Plans 1 and 2: 30% of final compensation plus 2% of final compensation for each year of service in excess of 20 years. Plan 3: 2% of final compensation for each year of service up to 40 years, reduced 0.42% for each month benefit commencement precedes age 55.
After July 1, 1986 but prior to July 1, 1988	2% of final compensation for each year of service up to 40 years.
After July 1, 1988 but prior to September 1, 1997	45% of final compensation plus 2% of final compensation for each year of service in excess of 20 years; maximum 80% of final compensation. Benefit based on prior formula is payable until July 1, 1991 and recomputed benefit is payable thereafter
After September 1, 1997 but prior to July 1, 2001	50% of final compensation plus 2% of final compensation for each year of service in excess of 20 years; maximum 80% of final compensation.
After July 1, 2001 but prior to October 9, 2004	55% of final compensation plus 2% of final compensation for service in excess of 20 years. The Pension System recomputed the benefit of each person who retired before July 1, 2001. The retiree’s benefit was increased by the result of multiplying the difference between 55% and the percentage used at the time of retirement in computing the retiree’s benefit for the first 20 years of service by the base salary of the retiree at the time of retirement. Retroactive cost-of-living increases were not applied to the increased benefit. This recomputed benefit is effective for all payments on or after July 1, 2001.

- After October 9, 2004

Participants sworn prior to October 9, 2004 will receive the highest of the following alternatives using Final Average Compensation effective after October 9, 2004, from October 9, 2004 through October 7, 2007:

1) 2.75% of Final Average Compensation for each of the first 20 years of service plus 2% of Final Average Compensation for each year of service in excess of 20 years, with a maximum of 80% of Final Average Compensation.
2) Benefit participant would have received had participant retired or entered the DROP immediately before October 9, 2004
3) Benefit calculated using a sliding average of the pay received for the pay periods elapsed since October 9, 2004.

New participants after October 9, 2004:
2.25% of Final Average Compensation for each of the first 20 years of service plus 2% of Final Average Compensation for each year of service in excess of 20 years, with a maximum of 80% of Final Average Compensation.

Additional Benefits

An extra monthly benefit of $150.00 is payable for life. Effective November 28, 1998, a $5,000 lump sum is payable upon retirement for members sworn prior to October 9, 2004.

Terminated Vested Pension Benefit

Eligibility

Sworn in before October 9, 2004 and more than 10 but less than 20 years of service. Termination on or after November 28, 1998.

Benefit

2.75% of final average compensation times years of service. This benefit commences at age 60 or at termination of service if later.

Deferred Retirement Option Plan (DROP)

Eligibility

20 years of service and sworn in prior to October 9, 2004.

Benefit

- After September 1, 1995 but prior to September 1, 1997

Eligible participants may elect to participate in the DROP until they leave active service. The member's retirement pension will be calculated based on service and earnings at the time the DROP is elected.

A notional account will be maintained for each DROP participant.

This account will be credited with the following amounts while the member is participant of the DROP:

- The member's monthly retirement pension, including applicable cost-of-living adjustments,
- The member's contribution to the Pension System, limited to 8.75% of pay, and
- Investment earnings/losses at the rate of the Pension System's earnings/losses averaged over a five-year period. Effective July 1, 2001, this rate is subject to a minimum of 0%.

A benefit equal to the DROP account balance is paid at the time the member leaves active service. The payment is made as a single lump sum.

If a DROP participant suffers an on-duty disability resulting in the inability to perform his/her usual and customary duties as a police officer or dies in the line of duty, he (or his survivors) are allowed to revoke the DROP election and to receive the more generous on-duty disability or death benefits.

After September 1, 1997 but prior to December 1, 1998	The Pension System recomputed the benefit of each person who entered the DROP before September 1, 1997. The benefit was increased in the same manner as the retiree's benefit.
After December 1, 1998 but prior to July 1, 2001	The Pension System recomputed the benefit of each person who entered the DROP before December 1, 1998. The benefit was recalculated based on Total Direct Pay less overtime upon entry to the DROP. This recomputed benefit is effective for all payments on or after December 1, 1998.
After July 1, 2001 but prior to October 9, 2004	The Pension System recomputed the benefit of each person who entered the DROP before July 1, 2001. The member's benefit was increased by the result of multiplying the difference between 55% and the percentage used at the time of DROP entry in computing the member's benefit for the first 20 years of service by the base salary of the member at the time of DROP entry. Retroactive cost-of-living increases were applied to the increased benefit. The account balance for each participant was recomputed as if this new benefit had been effective since DROP entry.
After October 9, 2004	A minimum of 3.00% interest will be credited to existing DROP accounts with a maximum of 7.00%. If the actuary certifies that past service costs are fully funded, the credit may be as high as 10.00%.
After July 1, 2016	Participants may participate in the DROP for a maximum of 20 years. Cost of living adjustments will not be granted while still active, and the member's contributions to the Pension System will no longer be credited to the DROP account. DROP accounts will be credited with interest equal 65% of the five-year average investment return, with a minimum of 2.50%.

Benefit Recalculation	Effective July 1, 2001, monthly benefit at retirement will be recalculated to be the greater of (i) current monthly benefit, or (ii)monthly benefit based on service at DROP entry and Final Compensation at retirement date. The recalculation provision was discontinued effective July 1, 2016.
Back DROP Option	Effective on July 1, 2001, a back DROP option is available for all eligible participants. The DROP account is recalculated under the option based on what the account balance would have been had the participant elected the DROP earlier than he/she actually did. The initial DROP entry date cannot be backdated prior to September 1, 1995 or prior to 20 years of credited service, and must be on the first of the month selected. The Back DROP provision was discontinued effective July 1, 2016.

Postretirement Option Plan (PROP)

Eligibility	Retired from DROP and sworn in prior to October 9, 2004.
Benefit	
▸ After November 28, 1998 but prior to July 1, 2001	A retired member is allowed to leave all or a portion of their DROP account in the System. These accounts are credited every calendar year with the 30-year Treasury bond rate as of June of the preceding year.
▸ After July 1, 2001	The interest rate earned on PROP accounts will be the same as the interest rate credited to DROP accounts, including a minimum credited rate of 0%.

Partial Lump Sum Optional Payment (PLOP)

Eligibility	Participant on or after October 9, 2004.
Benefit	
▸ After October 9, 2004	Up to 20% of the actuarial value of the accrued pension at retirement.

Disability Retirement

Eligibility	Effective July 1, 2001, a disabled participant is eligible for Disability Retirement as defined below: – Disability is defined as “unable to perform his/her usual and customary duties as a police officer”.

Benefit

- Duty-connected — The service retirement benefit accrued to date of disability. For participants before October 9, 2004, the disability benefit is 2.75% of final average pay times years of service with a minimum of 55% of final average pay. For participants after October 9, 2004, the disability benefit is 2.25% of final average pay times years of service with a minimum of 45% of final average pay.

Additional Benefits — For participants before October 9, 2004, an education allowance equal to 100% of final compensation less disability benefit is payable for up to four years for off-duty or duty-related disability.
Proportionate members injured while on-duty as a municipal worker will receive immediate off-duty benefit upon Board approval.

Survivor Benefits

Eligibility — Surviving spouses and dependent children and parents of participants, including surviving spouses of retired or disabled participants who were not married at the time of retirement or disability, provided the spouse was married to the participant for at least 5 years at the time of death.

Benefit

- Prior to September 1, 1997 — If duty-connected: monthly lifetime benefit equal to 100% of final compensation at date of death.
  If not duty-connected: monthly lifetime benefit equal to 100% of the service retirement benefit the participant had accrued at the time of death.
  Spouse’s benefit upon death after retirement: monthly lifetime benefit equal to actual benefit payable at time of death.
  Dependent children’s benefit if no surviving spouse: the benefit that would have been payable to the spouse is divided equally among the dependent children.
  If there is a surviving spouse, the dependent children of Plan 1and Plan 2 participants receive $25 per month. Dependent children include unmarried children who are under age 18, and for Plan 3, full-time students under age 22, or permanently disabled children.

Dependent parent's income if no surviving spouse or children, but there is a dependent parent: the benefit that would have been payable to the spouse will be paid to the dependent parent.

- After September 1, 1997 but prior to July 1, 2001 — The Pension System recomputed the benefit of each survivor whose original benefit was computed prior to September 1, 1997. The benefit was increased in the same manner as the retiree's benefit.
- After July 1, 2001 — The Pension System recomputed the benefit of each survivor whose original benefit was computed prior to July 1, 2001. The benefit was increased in the same manner as the retiree's benefit.

Additional Benefits — Effective December 1, 1998, a $5,000 lump sum is paid upon the death of an active member who was sworn in prior to October 9, 2004.

Effective July 1, 2001, an extra monthly benefit of $150.00 is payable for life. Children receiving equivalent of the spouse's benefit do not receive this additional benefit.

Benefit Adjustments

Cost-of-Living

- Prior to October 9, 2004 — Monthly benefits for participants receiving payments are increased each April 1 by 2/3 of the increase in the Consumer Price Index for All Urban Consumers (CPI-U) for the preceding calendar year. Effective September 1, 1997 this increase is subject to a minimum of 3.0% per year compounded and a maximum increase of 8.0% per year compounded.
- Between October 9, 2004 and July 1, 2016 — Monthly benefits for participants receiving payments are increased each April 1 by 80% of the increase in the Consumer Price Index for All Urban Consumers (CPI-U) for the preceding year, with a minimum of 2.4% and a maximum of 8%.
- After July 1, 2016 — Monthly benefits for participants receiving payments are increased each April 1 by 100% of the five-year average investment return minus 5.00%, with a minimum of 0.00% and a maximum of 4.00%.
  COLAs are suspended from July 1, 2017 through July 1, 2020 for members who are not over the age of 70 or receiving a line of duty -connected survivor benefit. Following this period, members will receive their COLA once they reach age 55.

Service Adjustments	Effective November 28, 1998, participants with previous service with the City in non-classified positions may use that service to satisfy the service requirement of 20 years for retirement purposes only. Effective July 1, 2001, participants who have service credit in more than one City of Houston Pension Plan may use their combined service to qualify for DROP participation. Effective July 1, 2001, participants involuntarily transferred to the System from the Houston Municipal Employees System will receive service under this plan for years worked while serving as a City Marshall, Airport Police or Park Police.

Contributions

Employee Contributions

▸ Prior to December 1, 1998	Each participant contributes 8.75% of base salary.
▸ After December 1, 1998 but before October 9, 2004	Each participant contributes 8.75% of average total direct pay less overtime.
After October 9, 2004 – Members sworn in prior to October 9, 2004	Each participant contributes 9.00% of pay. The additional 0.25% will be credited to the Plan's general fund. 8.75% of pay is used for purposes of crediting eligible DROP accounts
– Others	Each participant contributes 10.25% of pay, which will be credited to the Plan's general fund.
▸ After July 1, 2016	Each participant contributes 10.50% of pay, which will be credited to the Plan's general fund.
Refunds	Contributions are refunded without interest.

Employer Contribution	The City of Houston will contribute the City Contribution Rate which will consistent of a normal cost contribution and a fixed layer closed amortization schedule with each new loss layer having a 30 year period. Each layer will be assumed to begin with the fiscal year beginning 12 months after the valuation date.

SECTION FIVE

STATISTICAL SECTION

Summary

This section of the System's comprehensive annual financial report presents detailed information as a context for understanding what the information in the financial statements, note disclosures, and required supplementary information says about the System's overall financial health. All information presented was derived from the comprehensive annual financial reports for the relevant year and/or the System's benefits administration system.

Financial Trends

The **Changes in Fiduciary Net Position** schedule shows the additions and deductions from plan net assets and the resulting changes in plan net assets for the ten years ending June 30, 2018. Contributions from members and the City have grown steadily, increasing 81% during this ten year period, before the one-time contribution of $750 million from pension obligation bonds in fiscal year 2018. At the same time, deductions from plan net assets, which are primarily for benefits paid to members, have increased 141% during this period. The System's investment income during this ten year period, even with losses in three of the ten years, provided 53% of additions to plan net assets.

City and member contributions to the System are external sources of the additions to plan net assets. The **Contribution Rates** schedule shows what percent the City's and the members' contributions are of payroll for the ten years ending June 30, 2018. The accompanying chart of **Contributions and Benefits Paid** compares the total contributions made and the benefits paid for the ten years ending June 30, 2018. While the growth in benefits paid exceeds the growth in contributions, under the July 1, 2017 amendment to the System's governing statute, the System received $750 million from pension obligation bonds in fiscal year 2018 and changes were made to the member and City contributions, COLAs, and benefits with the purpose of addressing the System's unfunded liability through a risk sharing approach.

Contributions are not the only source from which benefits are paid. Earnings from the System's investments are the fund's internal sources of and, in most years, the largest component of additions to plan net assets. The **Investment Income** schedule provides details of the System's net investment gain/loss for the ten years ending June 30, 2018.

Deductions from Net Position for Benefits and Refunds by Type presents a detailed view of the benefits and refunds paid to members for the ten years ending June 30, 2018, and the accompanying chart graphically represents this data. Service retirements have historically accounted for the majority of benefit payments, growing over the last several years as the number of retirees has increased. Lump sum benefits are payments members and survivors receive at their discretion from their lump sum accounts either on or after the date they begin receiving monthly benefit payments, and therefore vary from year to year. Lump sum benefits decreased (46.8)% year over year in fiscal year 2018 to $139,361 thousand after having increased 232.1% in fiscal year 2017. Service and disability retirements combined increased 12.6% year over year in fiscal year 2018 to $221,672 thousand after having increased 9.2% in fiscal year 2017.

Valuation of Assets as a Percent of Pension Liabilities shows the percentage of the pension liability that is funded and **Net Assets Compared to Pension Liability** compares the actuarial value of the System's assets to the actuarial accrued liability. These charts graphically represent the funding progress of the System for the ten years ending June 30, 2018. The existence of an unfunded actuarial liability does not necessarily indicate financial problems. The July 1, 2017 amendment to the System's governing statute addressed the System's unfunded liability through a risk sharing approach. With the $750 million from pension obligation bonds in fiscal year 2018, the changes made to the member and City contributions, COLAs, and benefits, and adequate earnings and gains provided from investments, the System has a more sustainable funded status.

Participant Information

The **Membership** schedule provides a breakdown of the System's membership for the ten years ending June 30, 2018. For fiscal year 2018, active members decreased by 76 to 5,247 and retired members and their beneficiaries increased by 118. During the past ten years, the number of active members has remained steady with only a (0.1)% decrease while the number of retired members and their beneficiaries increased by 48.6%.

Operating Information

The **Pensions in Force** and **Pensions Awarded** schedules provide the number of pensions by type, age and payment amount for the year ended June 30, 2018.

The **Average Monthly Benefit Amounts by Years Credited Service** schedule presents the average final average salary and the number of retired members, in five-year increments of credited service, for the ten years ended June 30, 2018. During the past ten years, the average final average salary has increased 22.7% while the average monthly benefit has increased 17.4%.

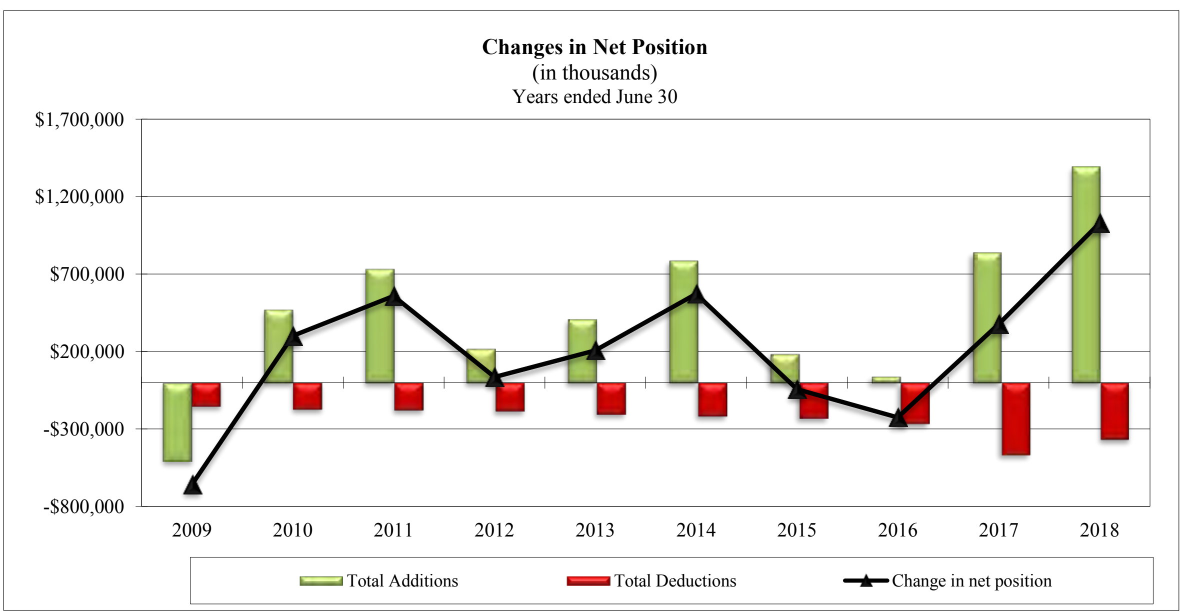
The **DROP and PROP Activity** schedules provide information about the total amount in DROP and PROP accounts and the total number of participants as well as the changes to those totals for the ten years ending June 30, 2018.

Changes in Fiduciary Net Position
Previous Ten Fiscal Years
($000's)

Fiscal Year	2009	2010	2011	2012	2013
Additions					
City contributions	$ 68,000	$ 73,192	$ 78,287	$ 83,027	$ 93,392
Members contributions	32,519	34,218	35,122	35,151	35,586
Investment income (net of expenses)	(607,482)	364,650	621,557	102,095	281,724
Securities lending income (net of expenses)	1,427	473	449	485	269
Total additions to plan net assets	(505,536)	472,533	735,415	220,758	410,971
Deductions:					
Benefits paid to members	144,112	161,735	172,041	180,014	199,255
Refunds to members	618	547	420	704	641
Professional and administrative expense	7,311	8,945	4,364	3,689	3,668
Total deductions from plan net assets	152,041	171,227	176,825	184,407	203,564
Change in net position	$ (657,577)	$ 301,306	$ 558,590	$ 36,351	$ 207,407

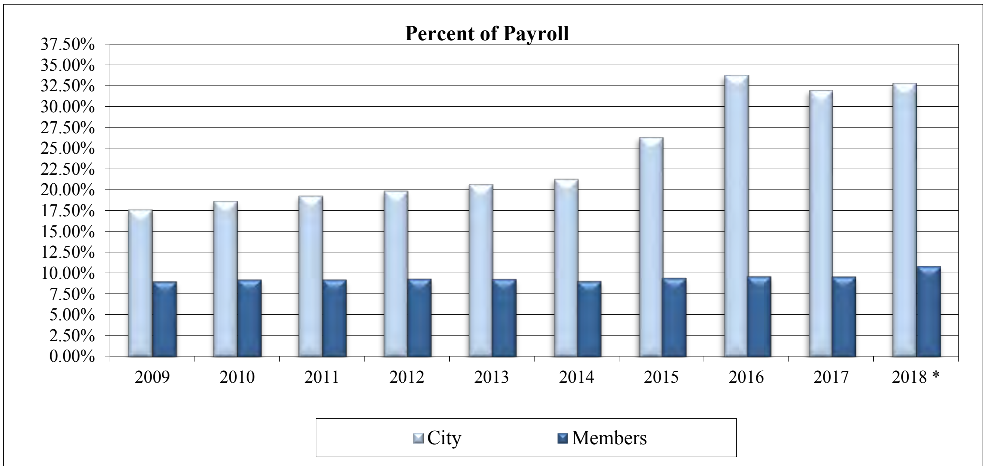
Fiscal Year	2014	2015	2016	2017	2018
Additions					
City contributions *	$ 103,372	$ 113,665	$ 137,392	$ 133,805	$ 887,143
Members contributions	37,012	37,719	39,017	40,104	45,254
Investment income (net of expenses)	649,022	35,249	(136,018)	667,171	462,801
Securities lending income (net of expenses)	131	92	185	305	279
Total additions to plan net assets	789,537	186,725	40,576	841,385	1,395,477
Deductions:					
Benefits paid to members	211,690	225,656	259,076	458,733	361,033
Refunds to members	906	945	978	1,696	1,329
Professional and administrative expense	3,439	3,478	4,585	4,238	3,679
Total deductions from plan net assets	216,035	230,079	264,639	464,667	366,041
Change in net position	$ 573,502	$ (43,354)	$ (224,063)	$ 376,718	$ 1,029,436

* City contributions in FY 2018 include a one time $750,000 thousand payment received from pension obligation bonds.

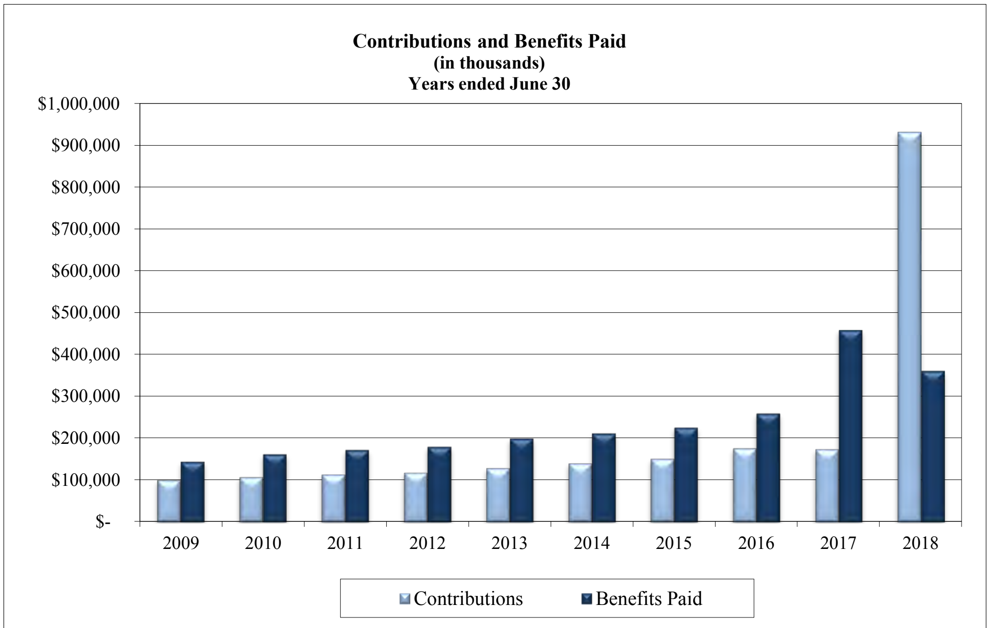


Contribution Rates
Previous Ten Fiscal Years

	Percent of Payroll	
Fiscal Year	City	Members
2009	17.73%	9.02%
2010	18.75%	9.23%
2011	19.34%	9.25%
2012	19.95%	9.33%
2013	20.72%	9.30%
2014	21.38%	9.05%
2015	26.37%	9.44%
2016	33.82%	9.60%
2017	31.99%	9.59%
2018 *	32.86%	10.84%



* 2018 percent of payroll does not include the $750,000,000 the City contributed through Pension Obligation Bonds. This amount is included in the contributions total in the table below.



Investment Income
Previous Ten Fiscal Years
($000's)

Fiscal Year	2009	2010	2011	2012	2013
Investing activities					
Net appreciation (depreciation) in fair value of investments	$ (643,053)	$ 330,724	$ 594,052	$ 53,935	$ 241,324
Interest	31,452	30,029	31,180	47,121	32,330
Dividends	13,170	16,608	18,998	19,200	20,238
Other income *	57	72	365	1,135	2,550
Total	(598,374)	377,433	644,595	121,391	296,442
Less investment expense	(9,108)	(12,783)	(23,038)	(19,296)	(14,718)
Net income (loss) from investing activities	(607,482)	364,650	621,557	102,095	281,724
Securities lending activities					
Securities lending income	1,903	631	599	646	359
Securities lending expense	(476)	(158)	(150)	(161)	(90)
Net income from securities lending activities	1,427	473	449	485	269
Total investment income (loss)	(606,055)	365,123	622,006	102,580	281,993

Fiscal Year	2014	2015	2016	2017	2018
Investing activities					
Net appreciation (depreciation) in fair value of investments	$ 625,973	$ 21,504	$ (152,667)	$ 632,552	$ 413,755
Interest	25,288	16,156	12,322	15,789	31,795
Dividends	18,119	20,714	18,714	32,923	31,590
Other income *	2,167	-	-	-	-
Total	671,547	58,374	(121,631)	681,264	477,140
Less investment expense	(22,525)	(23,125)	(14,387)	(14,093)	(14,339)
Net income (loss) from investing activities	649,022	35,249	(136,018)	667,171	462,801
Securities lending activities					
Securities lending income	175	123	250	407	373
Securities lending expense	(44)	(31)	(65)	(102)	(94)
Net income from securities lending activities	131	92	185	305	279
Total investment income (loss)	$ 649,153	$ 35,341	$ (135,833)	$ 667,476	$ 463,080

* The June 30, 2011 Agreement with the City allowed for a shortfall in the City's fixed payment for contributions for fiscal years 2012 and 2013, for which the City started making quarterly interest payments of $361 thousand in fiscal year 2012 and $542 thousand in fiscal year 2013 and 2014. These payments are included in Other income.

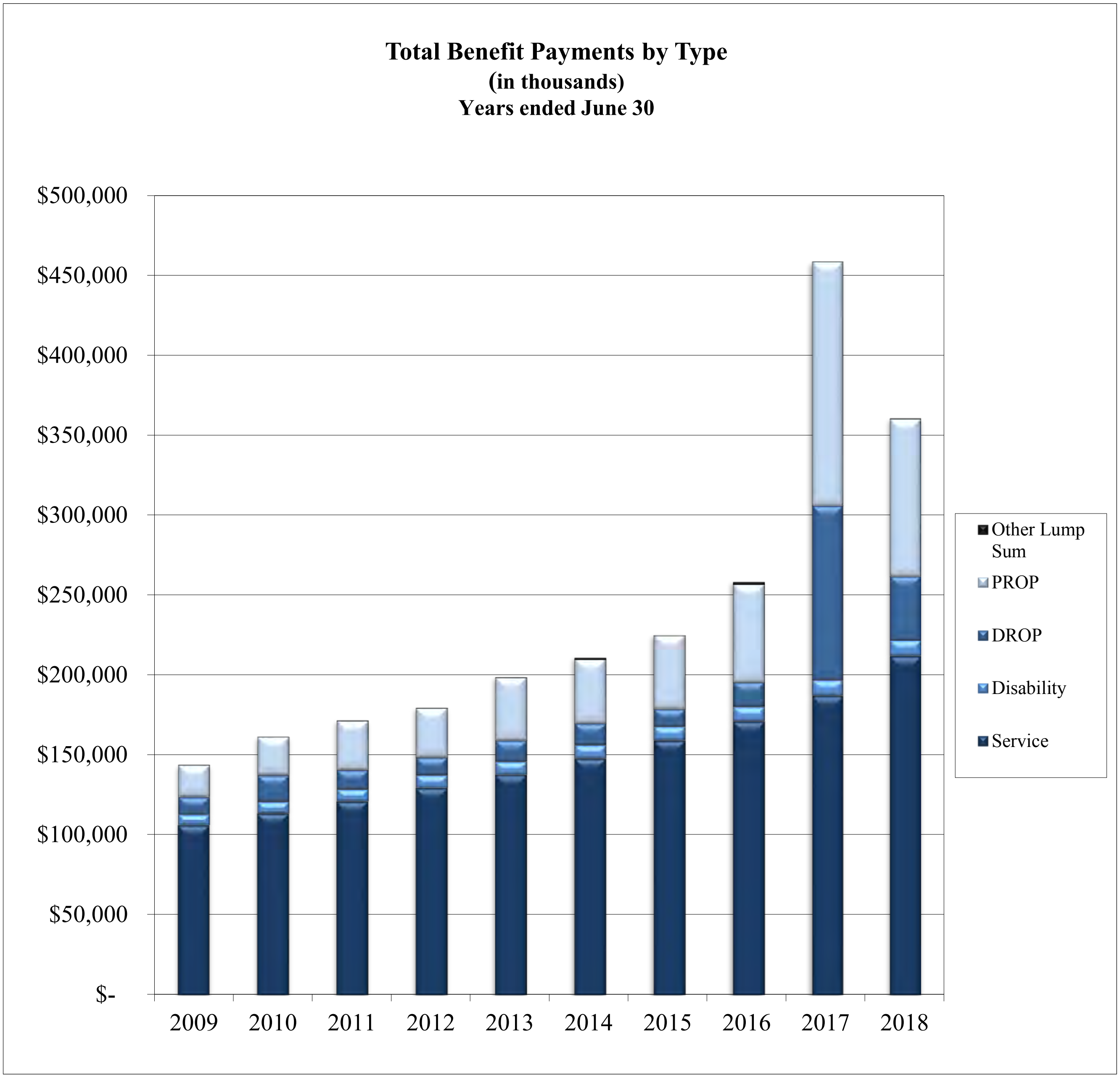
Deductions from Net Position for Benefits and Refunds by Type
Previous Ten Fiscal Years
($000's)

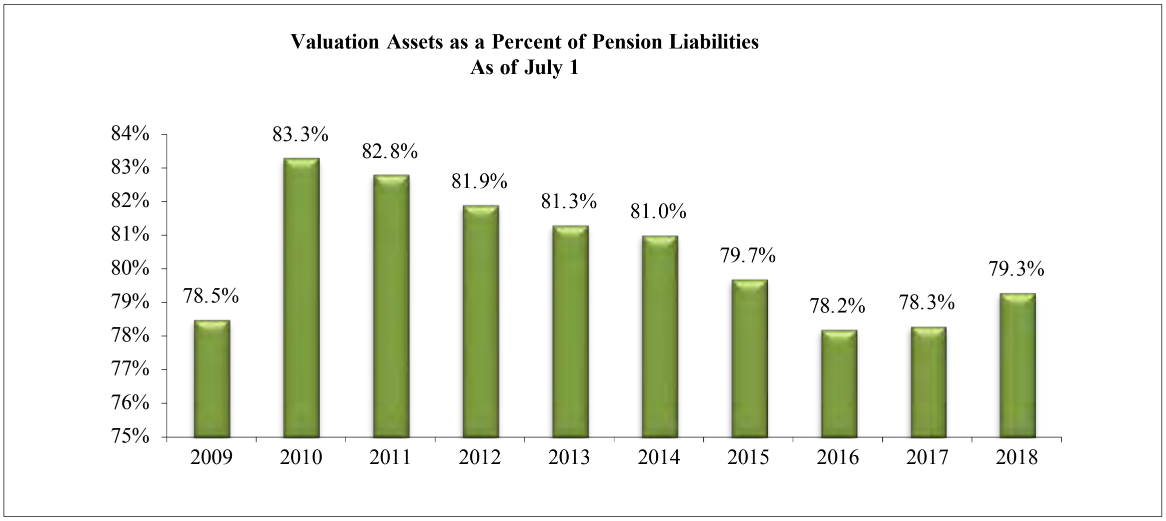
Fiscal Year	2009	2010	2011	2012	2013
Type of Benefit					
Service					
Retirees	$ 89,226	$ 95,198	$ 101,854	$ 108,886	$ 116,217
Survivors	17,291	18,612	19,425	20,694	21,586
Disability					
Retirees - duty	4,334	4,675	4,989	5,218	5,378
Retirees - nonduty	444	516	493	538	546
Survivors	1,715	1,868	1,960	2,147	2,120
Lump Sum					
DROP distributions	10,889	16,682	11,941	11,078	13,334
PROP distributions	19,922	24,035	31,125	31,180	39,857
Other *	291	149	254	273	217
Total benefits	$ 144,112	$ 161,735	$ 172,041	$ 180,014	$ 199,255
Type of Refund					
Death	$ 3	$ -	$ -	$ -	$ -
Separation	615	547	420	704	641
Total refunds	$ 618	$ 547	$ 420	$ 704	$ 641

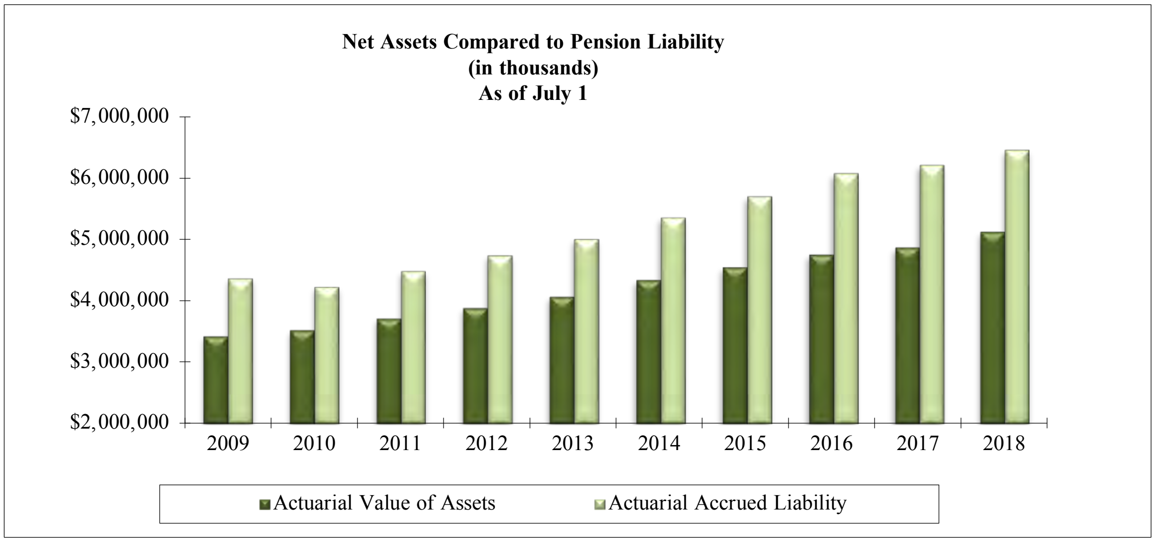
Fiscal Year	2014	2015	2016	2017	2018
Type of Benefit					
Service					
Retirees	$ 125,616	$ 135,705	$ 145,866	$ 159,686	$ 182,932
Survivors	22,333	23,510	25,244	27,371	28,956
Disability					
Retirees - duty	5,517	5,678	6,119	6,398	6,598
Retirees - nonduty	598	626	629	950	724
Survivors	2,195	2,290	2,344	2,398	2,462
Lump Sum					
DROP distributions	13,526	11,054	15,431	109,051	40,187
PROP distributions	40,623	46,575	61,580	152,780	98,690
Other *	1,282	218	1,863	99	484
Total benefits	$ 211,690	$ 225,656	$ 259,076	$ 458,733	$ 361,033
Type of Refund					
Death	$ -	$ -	$ -	$ -	$ -
Separation	906	945	978	1,696	1,329
Total refunds	$ 906	$ 945	$ 978	$ 1,696	$ 1,329

* Lump Sum, Other: Under the provisions of Article 6243g-4, Vernon's Annotated Texas Statutes (VATS), Sec. 12(b) and Sec. 15(c) a member who retires, including a member who was a DROP participant, and begins to receive a monthly service pension shall receive a one-time lump sum payment of $5,000. All one-time lump sum payments of $5,000 are reported with the DROP distributions.

Article 6243g-4, Vernon's Annotated Texas Statutes (VATS), Sec. 15(h) provides for the payment of an additional monthly disability benefit in the form of a lump sum to assist members retired due to disability with the costs of an education or training program. Payment of the additional monthly disability benefit occurs only after the member successfully completes each semester.


Total Benefit Payments by Type
(in thousands)
Years ended June 30
$500,000
$450,000
$400,000
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$-
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Other Lump Sum
PROP
DROP
Disability
Service

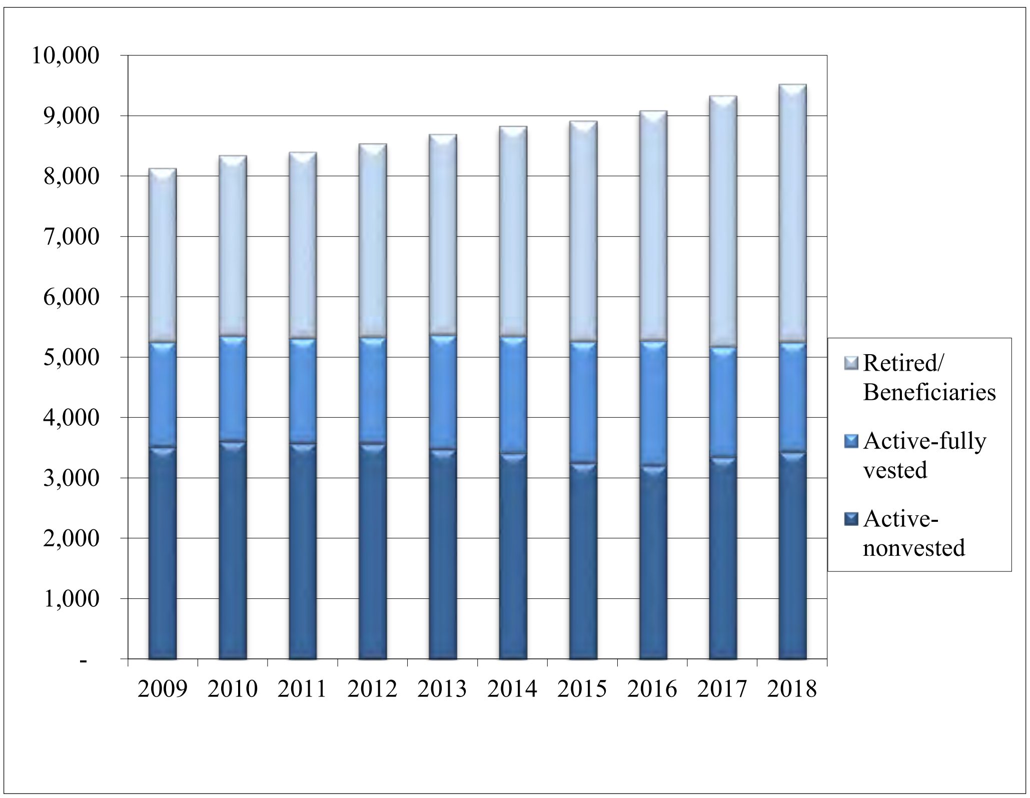




Charts through most recent actuarial valuation dated July 1, 2018.

Membership
Last Ten Fiscal Years

Fiscal Year	Active Nonvested	Active Fully Vested	Retired/ Beneficiaries	Terminated Vested	Totals
2009	3,516	1,735	2,876	19	8,146
2010	3,609	1,745	2,989	20	8,363
2011	3,578	1,733	3,087	23	8,421
2012	3,572	1,758	3,207	22	8,559
2013	3,481	1,885	3,326	24	8,716
2014	3,416	1,931	3,477	24	8,848
2015	3,255	2,007	3,647	22	8,931
2016	3,210	2,064	3,807	22	9,103
2017	3,357	1,814	4,157	27	9,355
2018	3,439	1,808	4,275	26	9,548



Total Pensions in Force by Type and by Age
Year Ended June 30, 2018

Age on June 30,	Total	Type of Pension: Service	Type of Pension: Disability	Survivor
Under 40	30	-	6	24
40-44	16	1	8	7
45-49	97	63	22	12
50-54	271	213	34	24
55-59	766	693	34	39
60-64	866	778	26	62
65-69	833	715	22	96
70-74	634	515	9	110
75-79	326	212	5	109
80-84	259	153	3	103
85 and over	177	92		85
Total	4,275	3,435	169	671

Pensions Awarded in Current Year by Type and by Age
Year Ended June 30, 2018

Age on June 30,	Total	Type of Pension: Service	Type of Pension: Disability	Survivor
Under 40	5	-	1	4
40-44	3	1	1	1
45-49	19	18	1	-
50-54	49	45	2	2
55-59	67	62	-	5
60-64	36	28	-	8
65-69	6	2	-	4
70-74	6	1	-	5
75-79	6	-	-	6
80-85	2	-	-	2
85 and over	2	-	-	2
Total	201	157	5	39

Pensions Awarded in Current Year by Type and by Monthly Amount
Year Ended June 30, 2018

Monthly Amount	Total	Type of Pension: Service	Type of Pension: Disability	Survivor
Under $1000	-	`	-	-
$1000-$2000	2	-	-	2
$2000-$3000	8	2	3	3
$3000-$4000	74	58	1	15
$4000-$5000	81	70	-	11
$5000-$6000	30	24	-	6
$6000 and over	6	3	1	2
Total	201	157	5	39

Average Monthly Benefit Amounts
Previous Ten Fiscal Years

Member Retiring During Fiscal Years		Years Credited Service										All Members
		<5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	>45	
2009	Avg monthly benefit	$ -	$ -	$ -	$ 3,064	$ 3,698	$ 3,518	$ 3,677	$ 4,396	$ 4,266	$ -	$ 3,669
	Avg final Avg salary	$ -	$ -	$ -	$ 6,415	$ 2,559	$ 5,242	$ 6,623	$ 6,635	$ 6,165	$ -	$ 5,150
	Avg DROP Balance	$ -	$ -	$ -	$ 5,000	$221,852	$359,788	$720,598	$ 980,656	$ 969,869	$ -	$477,574
	Number of retirees	-	-	-	2	29	50	36	8	3	-	128
2010	Avg monthly benefit	$ -	$ -	$ 2,832	$ 3,909	$ 3,474	$ 3,779	$ 3,851	$ 4,130	$ 3,973	$ -	$ 3,770
	Avg final Avg salary	$ -	$ -	$ 5,149	$ 5,888	$ 6,016	$ 6,382	$ 6,932	$ 6,895	$ 5,871	$ -	$ 6,457
	Avg DROP Balance	$ -	$ -	$ 5,000	$ 5,000	$194,752	$382,059	$759,037	$ 988,599	$ 987,988	$ -	$501,842
	Number of retirees	-	-	2	4	26	48	32	15	3	-	130
2011	Avg monthly benefit	$ 926	$ -	$ 2,562	$ 3,009	$ 3,679	$ 3,929	$ 3,640	$ 4,062	$ 3,941	$ -	$ 3,816
	Avg final Avg salary	$ 4,117	$ -	$ 4,658	$ 5,472	$ 6,457	$ 6,572	$ 6,581	$ 7,107	$ 6,063	$ -	$ 6,584
	Avg DROP Balance	$ -	$ -	$ 5,000	$ 5,000	$131,819	$442,433	$698,025	$1,065,857	$1,047,127	$ -	$536,243
	Number of retirees	1	-	1	1	15	68	28	17	1	-	132
2012	Avg monthly benefit	$ 972	$ 4,489	$ -	$ 2,605	$ 3,681	$ 4,011	$ 3,696	$ 4,148	$ 4,008	$ 5,642	$ 3,908
	Avg final Avg salary	$ 4,320	$ 4,489	$ -	$ 5,920	$ 6,606	$ 6,844	$ 6,663	$ 7,047	$ 6,047	$ 5,961	$ 6,726
	Avg DROP Balance	$ -	$ -	$ -	$ 5,000	$146,704	$466,282	$729,916	$1,066,076	$1,179,404	$1,536,548	$584,831
	Number of retirees	1	1	-	1	17	70	33	15	3	2	143
2013	Avg monthly benefit	$ -	$ -	$ -	$ -	$ 3,900	$ 4,024	$ 4,167	$ 4,076	$ 3,983	$ 5,535	$ 4,068
	Avg final Avg salary	$ -	$ -	$ -	$ -	$ 6,728	$ 6,554	$ 7,171	$ 7,208	$ 6,113	$ 7,236	$ 6,860
	Avg DROP Balance	$ -	$ -	$ -	$ -	$ 59,940	$514,240	$775,272	$1,161,766	$1,318,435	$1,674,363	$653,105
	Number of retirees	-	-	-	-	19	58	43	23	2	1	146
2014	Avg monthly benefit	$ -	$ -	$ -	$ 2,375	$ 3,769	$ 4,117	$ 4,162	$ 4,029	$ 3,802	$ -	$ 4,073
	Avg final Avg salary	$ -	$ -	$ -	$ 5,106	$ 6,713	$ 6,728	$ 6,841	$ 7,217	$ 6,019	$ -	$ 6,834
	Avg DROP Balance	$ -	$ -	$ -	$ 5,000	$ 87,531	$578,735	$762,664	$1,135,941	$1,309,578	$ -	$689,150
	Number of retirees	-	-	-	1	21	51	82	26	1	-	182
2015	Avg monthly benefit	$ -	$ 2,069	$ 1,246	$ 3,454	$ 3,811	$ 4,022	$ 4,286	$ 3,994	$ 4,346	$ -	$ 4,092
	Avg final Avg salary	$ -	$ 4,491	$ 5,277	$ 6,361	$ 6,786	$ 6,608	$ 7,112	$ 7,083	$ 7,076	$ -	$ 6,929
	Avg DROP Balance	$ -	$ -	$ -	$ 5,000	$132,108	$524,044	$751,329	$1,153,557	$1,443,545	$ -	$685,507
	Number of retirees	-	2	1	4	33	42	78	27	5	-	192
2016	Avg monthly benefit	$ 2,042	$ 1,744	$ 3,258	$ 2,578	$ 3,864	$ 3,928	$ 4,405	$ 4,345	$ 4,584	$ -	$ 4,183
	Avg final Avg salary	$ 4,432	$ 3,785	$ 5,784	$ 6,687	$ 6,831	$ 6,812	$ 7,198	$ 7,939	$ 8,747	$ -	$ 7,199
	Avg DROP Balance	$ -	$ -	$ -	$217,215	$106,042	$552,746	$897,392	$1,303,984	$1,842,540	$ -	$779,406
	Number of retirees	1	1	1	3	41	17	92	25	5	-	192
2017	Avg monthly benefit	$ -	$ 1,254	$ 2,514	$ 3,723	$ 4,015	$ 4,130	$ 4,470	$ 4,434	$ 4,475	$ 5,943	$ 4,355
	Avg final Avg salary	$ -	$ 5,574	$ 6,531	$ 6,769	$ 7,315	$ 7,282	$ 7,374	$ 7,809	$ 7,954	$ 8,400	$ 7,476
	Avg DROP Balance	$ -	$ -	$ -	$ 5,000	$183,834	$428,829	$927,025	$1,312,229	$1,769,362	$2,272,697	$899,158
	Number of retirees	-	2	1	1	64	28	187	77	23	4	387
2018	Avg monthly benefit	$ -	$ 2,500	$ 2,800	$ 3,333	$ 4,098	$ 4,235	$ 4,540	$ 4,465	$ 4,134	$ -	$ 4,306
	Avg final Avg salary	$ -	$ 5,555	$ 6,223	$ 6,389	$ 6,915	$ 6,661	$ 6,031	$ 5,347	$ 4,417	$ -	$ 6,319
	Avg DROP Balance	$ -	$ -	$ -	$ 46,065	$162,600	$435,687	$982,032	$1,231,062	$1,690,871	$ -	$657,970
	Number of retirees	-	2	1	2	39	36	68	13	1	-	162
Ten Years Ended June 30, 2018												
	Avg Monthly Benefit	$ 1,314	$ 2,342	$ 3,472	$ 2,720	$ 3,882	$ 3,805	$ 3,883	$ 3,965	$ 4,096	$ 5,799	$ 3,863
	Avg Final Avg Salary	$ 4,290	$ 5,468	$ 6,944	$ 5,232	$ 6,438	$ 6,121	$ 6,382	$ 6,783	$ 6,884	$ 7,537	$ 6,432
	Avg DROP Balance	$ -	$ 1,875	$ 4,286	$ 41,514	$154,774	$442,449	$776,854	$1,099,213	$1,444,654	$1,976,892	$639,751
	Number of Retirees	3	8	7	19	304	468	679	246	47	7	1,794

The above chart includes all Service, Proportionate and Disability retirements. It does not include Survivor benefits or pending Delayed Retirements. The DROP Balance includes $5,000 lump sum benefit.

DROP Activity
(dollars in thousands)
Years ended June 30

	DROP Accounts				DROP Participants		
Fiscal Year	Accumulations	Transfers to PROP	Distributions	Total	Entrants	Withdrawals	Total
2009	$ 132,351	$ (50,761)	$ (10,889)	$ 648,969	13	(126)	1,738
2010	130,524	(54,650)	(16,682)	708,161	106	(117)	1,727
2011	129,161	(61,234)	(11,941)	764,147	128	(112)	1,743
2012	142,330	(75,432)	(11,078)	819,967	148	(129)	1,762
2013	150,662	(89,028)	(13,334)	868,267	253	(143)	1,872
2014	147,948	(114,777)	(13,526)	887,912	232	(183)	1,921
2015	172,993	(128,413)	(11,054)	921,438	256	(186)	1,991
2016	189,245	(137,929)	(15,431)	957,323	253	(186)	2,058
2017	155,058	(228,259)	(109,051)	775,071	90	(342)	1,806
2018	162,511	(101,910)	(40,187)	795,485	137	(149)	1,794

PROP Activity
(dollars in thousands)
Years ended June 30

	PROP Accounts				PROP Participants		
Fiscal Year	Accumulations	Transfers from DROP	Distributions	Total	Entrants	Withdrawals	Total
2009	$ 24,721	$ 50,761	$ (19,922)	$ 275,829	113	(14)	700
2010	17,263	54,650	(24,035)	323,707	95	(22)	773
2011	19,615	61,234	(31,125)	373,431	115	(29)	859
2012	23,454	75,432	(31,180)	441,137	144	(23)	980
2013	25,364	89,028	(39,857)	515,672	162	(33)	1,109
2014	29,541	114,777	(40,623)	619,367	176	(28)	1,257
2015	41,104	128,413	(46,575)	742,309	176	(11)	1,422
2016	52,774	137,929	(61,580)	871,432	158	(11)	1,569
2017	49,295	228,259	(152,781)	996,205	208	(17)	1,760
2018	42,894	101,910	(98,706)	1,042,303	79	(15)	1,824

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