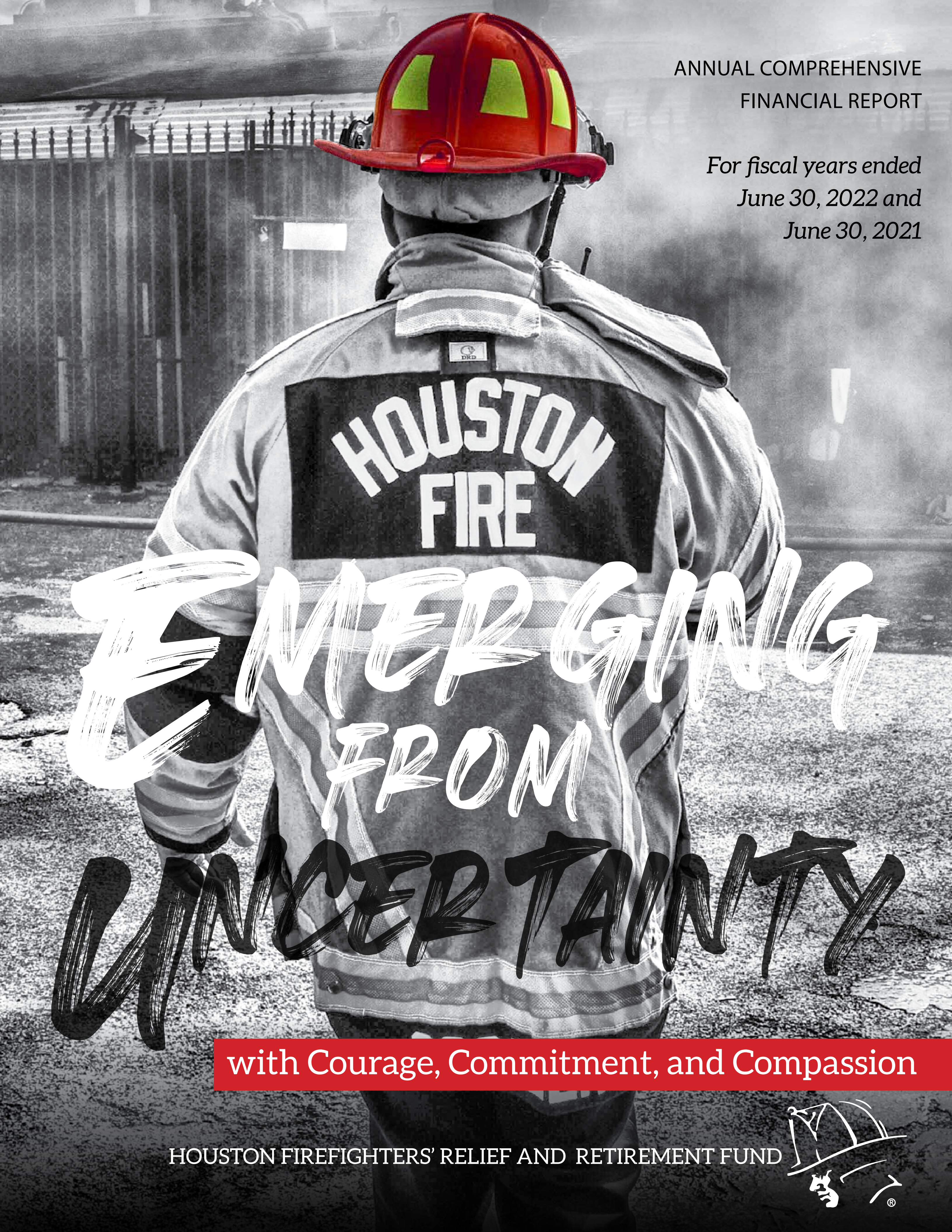
ANNUAL COMPREHENSIVE FINANCIAL REPORT

For fiscal years ended June 30, 2022 and June 30, 2021



EMERGING FROM UNCERTAINTY

with Courage, Commitment, and Compassion

HOUSTON FIREFIGHTERS' RELIEF AND RETIREMENT FUND

HOUSTON FIREFIGHTERS' RELIEF AND RETIREMENT FUND

An Independently Governed Component Unit of the City of Houston, Texas

ANNUAL COMPREHENSIVE FINANCIAL REPORT

FOR FISCAL YEARS ENDED JUNE 30, 2022 AND JUNE 30, 2021

Prepared through the combined efforts of the Houston Firefighters' Relief and Retirement Fund staff under the leadership of the Board of Trustees

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(Fiscal years ended June 30, 2022 and June 30, 2021)

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INTRODUCTION

LETTER OF TRANSMITTAL

INVESTING FOR FIREFIGHTERS AND THEIR FAMILIES®

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December 12, 2022

City Treasurer Designee
City of Houston
P.O. Box 1562
Houston, Texas 77251-1562

Dear City Treasurer:

The Annual Comprehensive Financial Report (ACFR) of the Houston Firefighters' Relief and Retirement Fund (the Fund), an independently governed component of the City of Houston, for the fiscal year ended June 30, 2022, is submitted herewith.

The Houston Firefighters' Relief and Retirement Fund was created in 1937 with the passage of a state law that provided benefits for firefighters in certain cities in Texas. In 1975, Article 6243e.2 was passed in the Texas legislature to create a fund for firefighters in cities with a population not less than 1.2 million. This statute was amended in 1997 into Article 6243e.2(1). Effective July 1, 2017, the Fund's statute (Vernon's Civil Statutes, Title 109, section 6243e.2(1)) was revised.

Article 6243e.2(1) states that a fund shall be created to provide retirement, disability, and death benefits for firefighters and their beneficiaries, and that it shall be governed by a Board of Trustees, which has sole responsibility for its maintenance. In earlier years, the City of Houston provided staff and financing for the daily administration of the Fund. Effective July 1, 1988, the Board of Trustees assumed full responsibility for its administration. Administration of the Fund includes accurately computing and disbursing retirement benefits, receiving and depositing contributions in a timely manner, accounting for investment activity, monitoring the activity of all external investment managers, auditing all financial activities of the Fund on an ongoing basis, and meeting reporting requirements in a timely manner.

Responsibility for the accuracy of the data and the completeness and fairness of the presentation, including all disclosures, rests with the Board of Trustees. To the best of the Board's knowledge and belief, the enclosed information is accurate in all material respects and is reported in a manner designed to present fairly the financial position and results of Fund operations. All disclosures necessary to enable the reader to gain an understanding of the financial activities of the Fund have been included.

THE HOUSTON FIREFIGHTERS' RELIEF AND RETIREMENT FUND

Established in 1937 by state statute, the Fund is the retirement system for Houston's firefighters. Day-to-day operations were largely performed by City of Houston employees until 1988, when the Board of Trustees started hiring its own staff and exerting more autonomy as permitted by statute. The pension fund is a defined benefit plan and is funded through a combination of employee and employer contributions and investment earnings. The Fund's membership consists of more than 7,200 active and retired firefighters and survivors of firefighters. Firefighters do not participate in the U.S. Social Security system.

State law gives the Board of Trustees responsibility for conducting all Fund business. The 10-member board consists of five active firefighters, one retired firefighter (elected by other retirees), the City Treasurer or individual performing those functions, the Mayor or an appointed representative of the Mayor and two citizen members elected by the firefighter trustees.

For the 39th year in a row, our Finance and Operations team has received the Government Finance Officers Association (GFOA) Certificate of Achievement for Excellence in Financial Reporting.

The Board of Trustees is proud to present to you the Annual Comprehensive Financial Report for the fiscal years ended June 30, 2022 and June 30, 2021.

ADMINISTRATION, STAFF AND PROFESSIONAL SERVICES

At fiscal year-end, the Fund staff was made up of 26 full-time and 4 part-time employee. The following professional organizations were employed by the Board of Trustees fiscal year ended June 30, 2022,to provide specialty services:

- Bank of New York Mellon is the custodian bank.
- McConnell & Jones, LLP, serves as the auditor.
- Buck Global LLC (formerly known as Conduent HR Consulting, LLC) is the actuary.

Most of the professional consultants appointed by the Board are listed on page 9 of this report. Other professionals employed by the Board are listed on page 48.

ACCOUNTING SYSTEMS AND REPORTS

As plan administrator of the Fund, the Board of Trustees maintains the following various internal controls to ensure material accuracy of all data:

- Bi-weekly control reports are generated by the Fund staff to ensure the accuracy of employee and employer contributions received from the City of Houston. Monthly reconciliations are performed on benefit payment information to confirm payment instructions to the custodian bank.
- Monthly reviews are performed on all investment transactions to ensure that dividends and interest on the investments of the Fund are properly credited, all assets are accounted for properly, all market valuations are appropriate, and each investment manager is in compliance with established guidelines.
- The checking account of the Fund, from which administrative payments are made, is reconciled monthly by the staff, and wire transfers from the custodian bank are reconciled monthly to the in-house cash account.
- The Budget and Audit Committee of the Board of Trustees, which sets general parameters for spending, meets at least quarterly to review administrative expenditures.
- The Personnel and Procedures Committee, a committee of the whole, formulates and reviews administrative procedures of the Fund.

The financial statements included in this report, along with all the information provided, are the responsibility of the management of the Fund. This system includes the appropriate segregation of duties and responsibilities, sound practices in the performance of those duties, capable personnel, and the organizational structure itself. The Fund believes that the internal controls in effect adequately safeguarded assets and provided reasonable, rather than absolute, assurance that the financials are free of any material misstatements. The concept of reasonable assurance recognizes that: (1) the cost of a control should not exceed the benefits likely to be derived; and (2) the evaluation of costs and benefits requires estimates and judgments by management.

The financial statements have been prepared in accordance with generally accepted accounting principles (GAAP) and the principles of governmental accounting and reporting pronounced by the Governmental Accounting Standards Board (GASB). The accrual basis of accounting is used to record assets, liabilities, revenues and expenses.

Revenues for the Fund are taken into account when earned without regard to date of collection. Expenses are recorded when the corresponding liabilities are incurred, regardless of when payment is made. For an overview of the financial position of the Fund, please refer to the Management's Discussion and Analysis in the Financial section.

Employee contributions remained stable between fiscal years 2021 and 2022 at 10.5% of pensionable pay. The City is required to contribute at a rate that has been agreed upon based on the Fund's statute (Vernon's Civil Statutes, Title 109, section 6243e.2(1)). The City contribution rate remainded the same between fiscal years 2021 and 2022 at 31.89% of pensionable pay.

INVESTMENTS

The Board of Trustees created the Investment Committee to oversee the investment portfolio. With guidance and advice from the Fund's professional staff, the Investment Committee determines policy, strategy, and monitors the performance of the Fund.

Key components of the investment program that enable the Fund to achieve its target return are a diversified investment portfolio, a long-term outlook, and prudent risk-taking commensurate with fulfilling the return target of the program. The Fund's assets are invested in short-term instruments (cash and cash equivalents), fixed income securities, domestic and international equity securities, private equity, private debt, real estate, and hedge funds. By investing in different types of assets, the impact that a downturn in one asset class would have on the Fund is minimized and the probability that the Fund will earn an adequate rate of return is improved. The Board maintains an investment outlook that emphasizes stability and long-term planning – because payments to participants and beneficiaries are long-term in nature – and avoids drastic asset shifts and market timing decisions.

Additional information regarding the investment results for the year is included in the Investment Information section of this report.

FINANCIAL HIGHLIGHTS

Additions to assets received by the Fund are used to fund current and future benefits for members and their beneficiaries. The primary sources of additions are contributions from active members, the City of Houston and investment income. Deductions from assets consist of benefits paid to retired members and their beneficiaries, fees for professional services, and operations costs.

The following table summarizes additions and deductions to plan net position for fiscal years 2022, 2021, and 2020.

	2022 (MILLIONS)	2021 (MILLIONS)	2020 (MILLIONS)
Beginning net position	$5,257	$4,103	$4,238
Additions	113	1,446	201
Deductions	276	292	336
Net Change	(163)	1,154	(135)
Ending net position	**$5,094**	**$5,257**	**$4,103**

FUNDING STATUS

The funding objective of the Fund is to establish contributions which, when combined with present assets and future investment returns, will be sufficient to meet the financial obligations to present and future retirees and beneficiaries.

In May 2017, the Board adopted the July 1, 2016 actuarial valuation after careful consideration and analysis of an independent experience study. The July 1, 2016 actuarial report indicates the Fund has a funding ratio of 80.6%.

Effective July 1, 2017, the Fund's statute (Vernon's Civil Statutes, Title 109, section 6243e.2(1)) now requires the Fund and the City of Houston to independently conduct annual Risk Sharing Valuation Studies (RSVS). It should be noted for any Fund RSVS, the Actuarial Value of Assets is based on the difference between the actual rate of return and a legislatively mandated 7% assumed rate of return recognized incrementally over five years.

The RSVS process is now used to determine the City of Houston's Contribution rate to the Fund. The RSVS's must include some assumptions specified in the Fund's statute. If the difference between the City and the Fund's employer contribution rate falls at or below 2%, the Fund's RSVS will be used to determine the employer contribution rate for the fiscal year. If the difference is greater than 2%, the Fund's and the municipality's actuaries must reconcile the rates until the difference falls within 2%. If it cannot be reconciled, the arithmetic average will be used. Thus far, the arithmetic average has been used.

In accordance with the Fund's governing statute, the City's calculated plan contributions for the fiscal year ending June 30, 2022, is based on the arithmetic average between the Fund's actuary's and the municipal actuary's estimated contribution rate in their respective Risk Sharing Valuation Studies. Based on the method described above, the municipality's determined contribution rate has remained the same as the previous year (31.89%). These percentages acknowledge an amortization deficit of the actuarial accrued liability over a closed amortization period of 30 years. The July 1, 2021 RSVS results indicate the Fund has a funding ratio of 102.63%.

Additionally, the Fund wishes, subject to the legislative regime, to establish contributions that are an approximate level percentage of payroll for each generation of active members. The effective members' contribution rate remained stable at 10.5% between fiscal year 2021 and 2022. Actuarial valuations and the RSVS can measure the progress toward such goals, as well as help test the adequacy of the contribution rate.

The July 1, 2016 valuation, which was approved by the Board for reporting purposes only, can be found in the Audit section of this report.

INDEPENDENT AUDIT

An audit was performed by McConnell & Jones, LLP, for the fiscal year ending June 30, 2022, and was conducted in accordance with auditing standards generally accepted in the United States of America. The Independent Auditors' Report is included in the financial section of this ACFR on page 12. The financial section also contains a management discussion and analysis report that provides a narrative introduction, overview and analysis of the financial statements which reflect Fund resources available for payment of benefits and other expenses.

CERTIFICATE OF ACHIEVEMENT

The Government Finance Officers Association (GFOA) of the United States and Canada awarded a Certificate of Achievement for Excellence in Financial Reporting to the Houston Firefighters' Relief and Retirement Fund, Houston, Texas, for its annual comprehensive financial report for the fiscal year ended June 30, 2022. This was the 39th year that the Fund has received this prestigious award. In order to be awarded a Certificate of Achievement, a governmental unit must publish an easily readable and efficiently organized annual comprehensive financial report. This report must satisfy both GAAP and applicable legal requirements.

A Certificate of Achievement is valid for a period of one year only. We believe that our current annual comprehensive 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.

ACKNOWLEDGMENTS

The compilation of this report reflects the combined effort of the Houston Firefighters' Relief and Retirement Fund staff under the leadership of the Board of Trustees. It is intended to provide complete and reliable information as a basis for making management decisions, as a means of determining compliance with legal provisions, and as a means of determining responsible stewardship for the assets contributed by the employee members and the City of Houston.

On behalf of the Board of Trustees, we would like to take this opportunity to express our appreciation to staff members and the many other professionals and participants who have worked so diligently to assure the successful operation of the Fund.

Sincerely,

Brett Robert Besselman,
Chairman

Timothy Schauer,
Executive Director

ADMINISTRATIVE ORGANIZATION

EXECUTIVE DIRECTOR
Timothy Schauer

CHIEF INVESTMENT OFFICER
Ajit Singh, FRM, CAIA

ACTUARY
Buck Global, LLC
(formerly known as Conduent HR Consulting, LLC)

AUDITOR
McConnell & Jones, LLP

FUND'S CUSTODIAN BANK
Bank of New York Mellon

COMMITTEES
Pension Benefits
Investment
Budget and Audit
Personnel and Procedures
Legislative
Memorial

INVESTMENT ADVISORS

1. Advent International Corporation
2. AeroEquity GP LLC
3. AEW Capital Management LP
4. Apax X GP Co. Limited
5. ARCIS Group, The
6. Ares Management Limited
7. Bertram Capital
8. BlackRock Inc.
9. Blackstone Credit BDC Advisors LLC
10. Blackstone Group, The
11. Blue Point Capital Partners
12. Bridgepoint Credit Services S.à.r.l.
13. Bridgewater Associates LP
14. Brookfield Asset Mgmt Private Inst Cap Adv US LLC
15. Cabot Properties LP
16. Capital Dynamics Inc.
17. CBF Manager LP
18. Clearlake Capital
19. Coller Investment Management Limited
20. Delta-v Capital LLC
21. Drum Capital Management LLC
22. Energy Spectrum Capital
23. Energy Trust LLC
24. EQT Fund Management S.à r.l.
25. Glouston Capital Management
26. GCM Grosvenor Private Markets
27. Grosvenor Capital Management LP
28. Harbert Management Corp
29. Harbourvest Partners LLC
30. Hellman & Friedman LLC
31. Horsley Bridge Partners, LLC
32. Insignia Capital Partners GP LLC
33. Kildare Partners
34. KKR Credit Advisors (US) LLC
35. KSL Capital Partners
36. Landmark Partners
37. Leonard Green & Partners LP
38. Lexington Partners
39. LightBay Investment Partners UGP LLC
40. Lightspeed Management Company LLC
41. Liquid Realty Partners
42. Lone Star Funds
43. Mellon Investments Corporation
44. Metropolitan Real Estate Management
45. New York Digital Investment Group LLC
46. Nordic Capital DPM LP
47. Northlane Capital Partners LLC
48. Phoenix Asia VI Limited
49. Portfolio Advisors LLC
50. Schroders Investment Management North America
51. Shenkman Capital
52. State Street Global Advisors
53. Stellex Management Partners LLC
54. StepStone Group LP
55. Sterling Organization, The
56. Sunley House Capital Management LLC
57. Timberland Investment Resources
58. Torchlight Investors LLC
59. TPG Holdings LP

NON-DISCRETIONARY CONSULTANTS
60. StepStone Group LP

For more information, refer to the schedule of Fees for Investment Services (page 57) and the schedule of Brokerage Commisions (page 58).

AN OVERVIEW OF FINANCIAL STATEMENT PREPARATION

At the end of each fiscal year, the Board and staff members prepare financial statements showing the financial activity of the Fund. The financial statements include the statements of fiduciary net position and changes in fiduciary net position for the years presented. The notes are essential to the completeness of the information in the financial statements.

After the financial statements are prepared, an independent outside auditor hired by the Board reviews the systems and methods used to arrive at the information in the financial statements. A financial audit is then performed to determine if the financial statements are free of material misstatement. The audit includes examination, on a test basis, of evidence supporting the amounts and disclosures in the financial statements.

The audit is conducted in accordance with generally accepted auditing standards. If the auditor finds the financial statements free of material misstatement, the auditor issues an opinion such as that found on page 12, stating that the statements fairly present the financial position of the Fund in accordance with GAAP – generally accepted accounting principles.

Some of the terms used in this section are defined in the Glossary section of this report.

STATEMENTS OF FIDUCIARY NET POSITION

The statements of fiduciary net position are statements of the financial condition of the Fund that show snapshots of Fund assets and liabilities at a specific point in time. In this case, it is the end of the fiscal year on June 30, 2022 and 2021.

The statements show assets, liabilities and the remaining Fund balance. An asset is anything having commercial, economic or exchange value. Assets include cash, receivables (interest and dividends earned by the investments of the Fund and employee member and employer contributions), investments, collateral on securities lending arrangements, and land.

Fund liabilities include money reserved for members who are entitled to benefits and obligations for professional services the Fund has used – but for which payment has not been made.

STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION

The statements of changes in fiduciary net position show the financial impact on the Fund of operations and investments during a period of time. In this case, it is the years ended June 30, 2022 and 2021. Additions to plan net position represent cash that came into, or is expected to come into, the Fund from events that take place during a fiscal year.

Additions include employee contributions, employer contributions and investment income. Investment gains are included because the increase (or decrease) in fair value of investments is shown as revenue since the investments are reported at fair value.

Deductions from plan net position represent the money that the Fund paid out or expects to pay out from events that take place during a fiscal year. Deductions include benefit payments to retirees and beneficiaries, refunds of contributions to firefighters who leave the Houston Fire Department, and professional and administrative expenses.

This statement provides useful information about what happened during a single year. Retirement funds, however, operate with a long-term strategy (see "An Overview on the Actuarial Valuation" in the Actuarial section of this report).

Changes in plan net position at the end of the statement show the previous year's balance, plus revenues after expenses, to total the plan net position held in trust for pension benefits at fiscal year-end.

NOTES TO FINANCIAL STATEMENTS

The notes are an integral part of the financial statements. The notes include any information that might be needed to have an adequate understanding of the overall financial status of the Fund.

In this report, the notes include explanations of the payment and refund features of the governing statute of the Fund, the accounting methods used by the Fund, the funding methods used, the methods and assumptions the actuary uses to determine contribution requirements, and any significant changes that take place after fiscal year-end.

SUPPLEMENTARY INFORMATION

The supplementary 10-year trend information provides additional historical perspective. These charts show the progress toward reaching the goal of being totally funded, as well as sources of revenues and types of expenses of the Fund during the fiscal year. Other supplementary information provides additional details for analysis.

SECTION 02

FINANCIAL INFORMATION

McConnell Jones

Independent Auditor's Report

Board of Trustees
Houston Firefighters' Relief and Retirement Fund:

Opinion

We have audited the financial statements of Houston Firefighters' Relief and Retirement Fund (the Fund), which comprise the Statements of Fiduciary Net Position as of June 30, 2022 and 2021, and the related Statements of Changes in Fiduciary Net Position for the years then ended, and the related notes to the Fund's financial statements, which collectively comprise the Fund's basic financial statements as listed in the table of contents.

In our opinion, the accompanying basic financial statements referred to above present fairly, in all material respects, the financial position of the Fund as of June 30, 2022 and 2021, and the changes in financial position for the years then ended, in accordance with accounting principles generally accepted in the United States of America (US GAAP).

Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (US GAAS). Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Fund's Basic Financial Statements* section of our report. We are required to be independent of the Fund, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Fund's Basic Financial Statements

Management is responsible for the preparation and fair presentation of the Fund's basic financial statements in accordance with US GAAP, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the Fund's basic financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the Fund's basic financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Fund's ability to continue as a going concern for twelve months beyond the Fund's basic financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibility for the Audit of the Fund's Basic Financial Statements

Our objectives are to obtain reasonable assurance about whether the Fund's basic financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with US GAAS will

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always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the Fund's basic financial statements.

In performing an audit in accordance with US GAAS, we:

- exercise professional judgment and maintain professional skepticism throughout the audit.

- identify and assess the risks of material misstatement of the Fund's basic financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the Fund's basic financial statements.

- obtain an understanding of internal control relevant to the audit 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 Fund's internal control. Accordingly, no such opinion is expressed.

- evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the Fund's basic financial statements.

- conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Fund's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audits.

Required Supplementary Information

US GAAP requires that the management's discussion and analysis, schedule of changes in the Fund's net pension liability and related ratios, schedule of employer contributions, and schedule of investment returns, as listed in the table of contents, be presented to supplement the Fund's basic financial statements. Such information is the responsibility of management and, although not a part of the Fund's 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 Fund's basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with US GAAS, 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 Fund's basic financial statements, and other knowledge we obtained during our audit of the Fund's basic financial statements. We do not express an opinion or provide any assurance on the information because the

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limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Additional Supplementary Information

Our audits were conducted for the purpose of forming an opinion on the Fund's financial statements that collectively comprise the Fund's basic financial statements. The additional supplementary information, which comprise Schedule 4 and Schedule 5 as listed in the table of contents, is presented for purposes of additional analysis and is not a required part of the Fund's basic financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the Fund's basic financial statements. The information has been subjected to the auditing procedures applied in the audit of the Fund's 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 Fund's basic financial statements or to the Fund's basic financial statements themselves, and other additional procedures in accordance with US GAAS. In our opinion, the additional supplementary information is fairly stated, in all material respects, in relation to the Fund's basic financial statements as a whole.

McConnell & Jones LLP

Houston, Texas
October 18, 2022

Management is pleased to present a discussion and analysis of the Houston Firefighters' Relief and Retirement Fund (the Fund) financial activity for the fiscal years ended June 30, 2022, 2021 and 2020. This discussion is intended to serve as an introduction to the Fund's basic financial statements which reflect Fund resources available for payment of benefits and other expenses. The basic financial statements consist of:

The Statements of Fiduciary Net Position which reflect a snapshot of the Fund's financial position and reflect resources available for the payment of benefits and other expenses at fiscal year-end. The statements show the Fund's assets, liabilities, and fiduciary net position available at the end of the fiscal year (Assets - Liabilities = Net Position).

The Statements of Changes in Fiduciary Net Position which reflect the results of all transactions that occurred during the fiscal year and show the fiscal year-end additions to and deductions from the Fund (Additions - Deductions = Net Change in Net Position). Essentially, this statement shows what has happened to the Fund assets during the fiscal year. If change in net position increased, then additions were more than the deductions. If change in net position decreased, then additions to the Fund were less than the deductions from the Fund.

Notes to the Basic Financial Statements which are an integral part of the basic financial statements and include additional information that might be needed to have an adequate understanding of the overall financial status of the Fund.

Required Supplementary Information (Unaudited) and Additional Supplementary Information follows the Notes to the Basic Financial Statements and provides historical and additional information considered useful in reviewing the basic financial statements.

FINANCIAL HIGHLIGHTS

SUMMARY COMPARATIVE STATEMENTS OF FIDUCIARY NET POSITION

	Fiscal Year 2022	Fiscal Year 2021	Fiscal Year 2020
ASSETS			
Investments	$ 4,907,583,097	$ 5,242,120,729	$ 4,084,064,404
Capital assets (net of depreciation):			
Land and building	3,592,645	3,864,923	4,188,299
Furniture, fixtures and equipment	118,771	110,660	79,466
Other	228,988,782	95,091,154	88,122,210
Total assets	5,140,283,295	5,341,187,466	4,176,454,379
LIABILITIES			
Short-term liabilities	46,546,836	84,424,658	73,522,600
Total liabilities	46,546,836	84,424,658	73,522,600
Net Position	$ 5,093,736,459	$ 5,256,762,808	$ 4,102,931,779

Fiduciary net position at the end of fiscal year 2022, 2021, and 2020 totaled $5,093,736,459, $5,256,762,808, and $4,102,931,779, respectively. Although strong returns from private equity, real estate, and private debt assets resulted in net investment income of $522,517, along with $112,293,064 in contributions to the plan, the decrease in fiduciary net position for fiscal year 2022 is a result of net deductions (benefit payments, refund of contributions and Professional/Administrative Expenses) exceeding the overall net income.

SUMMARY COMPARATIVE STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION

	Fiscal Year 2022	Fiscal Year 2021	Fiscal Year 2020
Beginning net position	$5,256,762,808	$4,102,931,779	$4,237,692,080
ADDITIONS (REDUCTIONS) TO NET ASSETS, NET:			
Contributions	112,293,064	107,368,429	117,277,779
Net appreciation in fair value of investments	1,146,381	1,330,056,713	66,752,612
Interest income	5,585,459	14,522,710	22,496,378
Dividends	1,214,454	1,010,208	1,005,808
Net activity from securities lending	202,157	116,337	69,610
Earnings from private equity and real estate investments	414,592	607,376	460,302
Other income	100,317	22,190	146,003
Less: cost of investment services	(8,140,843)	(8,105,569)	(6,815,731)
Net investment and other income	522,517	1,338,229,965	84,114,982
Total additions to net assets, net	112,815,581	1,445,598,394	201,392,761
DEDUCTIONS FROM NET ASSETS:			
Benefits	268,370,833	283,989,155	327,324,432
Contribution Refunds to Members	2,227,893	2,425,034	2,998,517
Professional/Administrative Expenses	5,243,204	5,353,176	5,830,113
Total deductions from net assets	275,841,930	291,767,365	336,153,062
Change in net position	(163,026,349)	1,153,831,029	(134,760,301)
Ending net position	$ 5,093,736,459	$ 5,256,762,808	$ 4,102,931,779

ADDITIONS

CONTRIBUTIONS

The funds needed to finance retirement benefits are accumulated through the collection of employee and employer contributions and through income on investments. These are offset by deductions from net assets. The amounts contributed by employee members for the last three fiscal years were $30,941,552 (fiscal year 2022), 29,873,223 (fiscal year 2021), and $33,441,101 (fiscal year 2020). Employer contributions for the last three years were $81,351,512 (fiscal year 2022), $77,495,206 (fiscal year 2021), and $83,836,678 (fiscal year 2020).

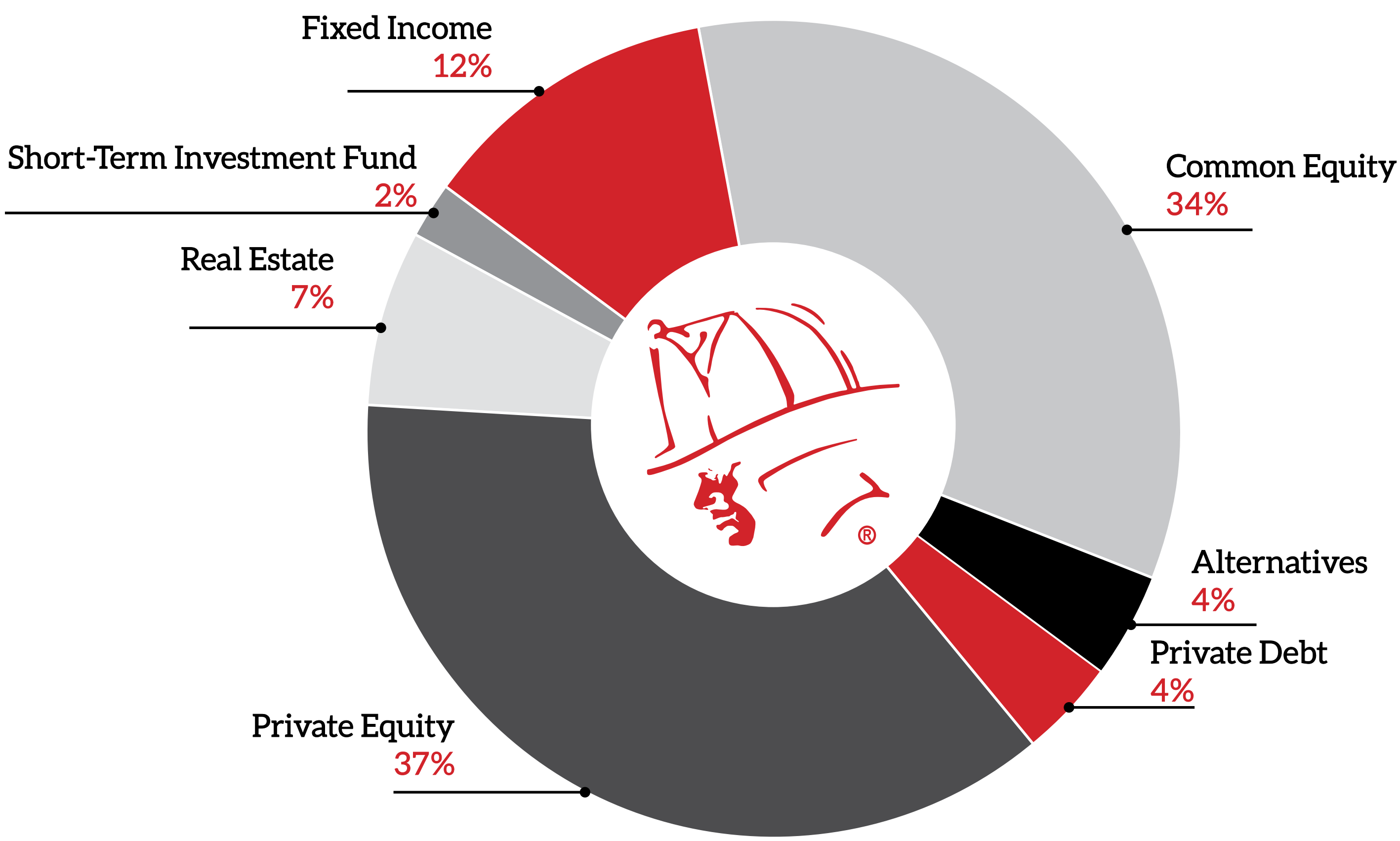
Although the employer contribution rate in fiscal year 2022 remained the same as fiscal year 2021 (31.89%), the employer contributions increased between fiscal year 2022 and 2021 due to an increase in covered payroll. The same contribution decreased between fiscal year 2021 and 2020 due to a statutory decrease in the City of Houston contribution rate along with a decrease in covered payroll. The employer contribution rate decreased from 32.34% in fiscal year 2020 to 31.89% in fiscal year 2021. The employee's contributions consist of both the statutory contributions plus unused leave pay (mustering out pay) that is placed in the member's active DROP account. The increase in the employee contributions between fiscal year 2021 and 2022 is due to an increase in covered payroll. The decrease in the employee contributions between fiscal year 2020 and 2021 is due to a decrease in covered payroll and a reduction in mustering out pay.

NET INVESTMENT AND OTHER INCOME

In Fiscal Year 2022, the Fund's investment portfolio produced a total return of 0.10% gross (0.01% net). The best performing asset classes were private equity (25.3%), real estate (24.0%), and private debt (11.8%). Hedge funds, fixed income, domestic equity, and international equity returned -8.6%, -9.0%, -15.1%, and -21.7% respectively. In addition, the cash equivalents portfolio returned -5.0%.

At June 30, 2022, short-term investment funds represented 2% of the portfolio, fixed income securities represented 12%, domestic and international common equities represented 34%, alternatives represented 4%, the private debt portfolio represented 4%, the private equity portfolio represented 37% and the real estate portfolio represented 7%.

FUND ASSET ALLOCATION AS OF JUNE 30, 2022



DEDUCTIONS

Most deductions from fiduciary net assets in a retirement fund relate to the purpose for which it has been created: the payment of benefits. Consequently, recurring benefit payments prescribed by the Fund, lump sum benefits, refunds of contributions to members, and the cost of administering the Fund comprise the total deductions.

Deductions for fiscal years 2022, 2021, and 2020 totaled $275,841,930, $291,767,365, and $336,153,062, respectively. This represents a net decrease of approximately 5.5% between fiscal years 2022 and 2021, 13.20% between fiscal years 2021 and 2020, and an increase of approximately 20.65% between fiscal years 2020 and 2019.

Benefits Paid To Members

The decrease of 5.5% in fiscal year 2022 (compared to fiscal year 2021) and 13.24% in fiscal year 2021 (compared to fiscal year 2020) are mainly due to a reduction in DROP and PROP disbursements.

Professional and Administrative Expenses

Professional and administrative deductions decreased between fiscal years 2022 and 2021 (by 2.05%), and fiscal years 2021 and 2020 (by 8.18%). During fiscal year 2022, the decrease was primarily due to less legal and insurance expense The 8.18% decrease between fiscal years 2021 and 2020 was primarily due to a reduction in staff and office expenses related to staff working from home for most of the fiscal year.

NET POSITIONS

Total additions to net position for fiscal year 2022 were $112,815,581 and total deductions were $275,841,930 thereby decreasing the Fund's net position by $163,026,349. Total additions to net assets for fiscal year 2021 were $1,445,598,394 and total deductions were $291,767,365 thereby increasing the Fund's net position by $1,153,831,029.

ACTUARY VALUATION INFORMATION

The Fund, by statute, may adopt an actuarial valuation once every three years. The Texas Review Board has determined that the annual Risk Sharing Valuation Study (RSVS) satisfies the statutory requirement.

In May 2017, the Board of Trustees adopted and certified the finalized July 1, 2016 actuarial valuation. The July 1, 2016 actuarial report indicates the Fund has a funding ratio of 80.6%.

The Board adopted the July 1, 2016 actuarial valuation after careful consideration and analysis of an independent experience study. It should be noted that the Actuarial Value of Assets is based on the difference between the actual rate of return and the 7.25% assumed rate of return recognized in the actuarial value over five years beginning July 1, 2014. Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2013.

The adoption of the July 1, 2016 actuary valuation for financial statement reporting purposes included the following changes in assumptions and methods since the prior year: a) the mortality rates applicable to active and non-disabled participants are based on the PR-2000 table projected 10 years from the valuation date. Therefore, the mortality rates have been updated from the PR-2000 table projected to 2026 using Scale AA. This increased the actuarial accrued liability by approximately $4 million. b) the assumed investment rate of return was changed from 8.5% to 7.25%. This change increased the actuarial accrued liability by approximately $504 million.

GASB 67 requires a disclosure of the Net Pension Liability (NPL). The NPL is the difference between the Total Pension Liability (TPL) and the fair value of assets. GASB 67 requires the determination for the TPL using the individual entry age method, level percent of pay actuarial cost method and a discounted rate.

Information about whether the fiduciary's net positions are increasing or decreasing over time relative to the total pension liability is provided in the Schedule of Changes in the Fund's Net Pension Liability and Related Ratios - Unaudited (on page 42).

Annual required contributions of the employer and contributions made by the employer in relation to the determined contributions actuarial valuation are provided in the Schedule of Employer Contributions - Unaudited (on page 43). Effective July 1, 2017, the Fund's statute requires the Fund and the City of Houston to independently conduct annual RSVS. The RSVS is now a component used to determine the City of Houston's Contribution rate to the Fund.

CONTACTING THE FUND'S FINANCIAL MANAGEMENT

This financial report is designed to provide our members, business partners, and taxpayers with a general overview of the Fund's financial activities. If you have questions about this report or need additional information, contact the Executive Director of the Houston Firefighters' Relief and Retirement Fund at 4225 Interwood North Parkway, Houston, Texas 77032.

STATEMENTS OF FIDUCIARY NET POSITION (JUNE 30, 2022 AND JUNE 30, 2021)

Assets	2022	2021
INVESTMENTS, AT FAIR VALUE:		
Short-term investment funds	$ 124,441,551	$ 160,416,145
Fixed income:		
Domestic	238,491,549	378,359,460
International	346,639,125	446,842,064
Common equity:		
Domestic	1,318,011,838	1,102,112,447
International	331,929,274	959,541,538
Preferred equity:		
Domestic	0	674,442
Hedge funds	210,899,070	253,704,771
Private debt	190,970,112	97,629,387
Private equity	1,804,855,074	1,534,381,467
Real estate	341,345,504	308,459,008
Total investments	**$ 4,907,583,097**	**$ 5,242,120,729**
Cash and cash equivalents	$ 62,187,492	$ 6,101,892
RECEIVABLES:		
Accrued interest	3,489,282	2,449,189
Due from securities lending	21,775	13,420
Receivables for investments sold	114,946,574	59,170
Accrued dividends	7,441	12,691
City of Houston contributions	6,241,794	5,924,407
Member contributions	2,310,227	2,081,198
Other	43,325	53,871
Total receivables	**$ 127,060,418**	**$ 10,593,946**
Collateral on securities lending arrangements, at fair value	38,945,699	$ 77,686,503
Land	483,325	483,325
Building, net	3,109,320	3,381,598
Furniture, fixtures and equipment, net	118,771	110,660
Prepaids	795,173	708,813
Total assets	**$ 5,140,283,295**	**$ 5,341,187,466**
LIABILITIES		
Accounts payable and accrued expenses	5,435,206	$ 4,175,452
Payables for investments purchased	1,659,995	2,458,644
Interest payable	505,936	104,059
Collateral on securities lending arrangements, at fair value	38,945,699	77,686,503
Total liabilities	**$ 46,546,836**	**$ 84,424,658**
NET ASSETS		
Net investment in capital assets	3,711,416	$ 3,975,583
Restricted for self-insurance fund	5,000,000	5,000,000
Unrestricted	5,085,025,043	5,247,787,225
Plan net position restricted for pensions	5,093,736,459	$ 5,256,762,808

See accompanying notes to basic financial statements.

STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION
(FOR FISCAL YEARS ENDED JUNE 30, 2022 AND JUNE 30, 2021)

	2022	2021
ADDITIONS (REDUCTIONS) TO PLAN NET POSITION, NET:		
Contributions:		
City of Houston	$ 81,351,512	$ 77,495,206
Members	30,941,552	29,873,223
Total contributions	**$ 112,293,064**	**$ 107,368,429**
NET INVESTMENT INCOME:		
Net appreciation in fair value of investments	$ 1,146,381	$ 1,330,056,713
Interest	5,585,459	14,522,710
Dividends	1,214,454	1,010,208
Earnings from private equity	379,907	514,997
Earnings from real estate	34,685	92,379
Other	100,317	22,190
Securities lending arrangements:		
Earnings	202,157	55,354
Rebates and fees	0	60,983
Total securities lending arrangements	**$ 202,157**	**$ 116,337**
Gross investment income	$ 8,663,360	$ 1,346,335,534
Less: investment services expense	(8,140,843)	(8,105,569)
Net investment income	522,517	1,338,229,965
Total additions (reductions) to plan net position, net	**$ 112,815,581**	**$ 1,445,598,394**
DEDUCTIONS FROM PLAN NET POSITION:		
Benefits paid to members	$ 268,370,833	$ 283,989,155
Contribution refunds to members	2,227,893	2,425,034
Professional services	1,082,320	1,140,034
Administrative expenses	4,160,884	4,213,142
Total deductions from plan net position:	**$ 275,841,930**	**$ 291,767,365**
Net (decrease) increase in plan net position	$ (163,026,349)	$ 1,153,831,029
Plan net position restricted for pensions beginning of year	5,256,762,808	4,102,931,779
Plan net position restricted for pensions end of year	**$ 5,093,736,459**	**$ 5,256,762,808**

See accompanying notes to basic financial statements.

1. DESCRIPTION OF FUND

GENERAL

The Houston Firefighters' Relief and Retirement Fund (the Fund) was created in 1937 by act of the 45th Legislature of the State of Texas (Article 6243e). The current governing statute is Article 6243e.2(1), Vernon's Texas Civil Statutes (the Act). The Fund is a single employer defined benefit pension plan covering all firefighters employed full time by the City of Houston (the City) and provides for service, disability, deferred and death benefits for eligible members and their survivors. At June 30, 2022 and 2021, the membership of the Fund consisted of the following:

	2022	2021
Retirees and beneficiaries currently receiving benefits	3,650	3,602
Former members entitled to benefits but not yet receiving them	23	17
ACTIVE MEMBERS:		
Vested	2,448	2,511
Nonvested	1,192	1,144
Total members	**7,313**	**7,274**

The Fund is a local governmental plan and, therefore, is not subject to the Employee Retirement Income Security Act of 1974.

The Fund is a component unit of the City. The operation of the Fund is solely for the City of Houston firefighters. The Fund is governed by a Board of Trustees (the Board) and can only be terminated or amended by an act of the Legislature of the State of Texas. One member of the Board is either the City mayor or an appointed representative, five members are elected by active firefighters, one member is elected by retired firefighters, two members are citizen representatives, and one member is the City treasurer designee.

The following description of the Fund provides only general information. Members should refer to the Summary Plan Description for a more complete description of the Fund's provisions.

CONTRIBUTIONS

Active members are required to contribute to the Fund a certain percentage of qualifying salary. The City is required to contribute at a rate that has been agreed upon based on the Fund's governing statute.

For fiscal years 2022 and 2021, the active members' contribution rate was 10.50% and the City's contribution rate was 31.89%. The Fund's contributions are reduced by the contributions to the Houston Firefighters' Relief and Retirement Fund Section 415(m) Replacement Benefit Plan, if any.

PENSION BENEFITS

All members who retired prior to November 1, 1997 should consult the Act in effect at the time of retirement to determine pension benefits.

Members with 20 or more years of service retiring on or after November 1, 1997, are entitled to a service retirement of 50% of average monthly salary (defined as the monthly average of their highest individual 78 pay periods), plus 3% of average monthly salary for each year of service in excess of 20 years until the member completes 30 years of service, for a total monthly pension not to exceed 80% of the member's average monthly salary for the highest 78 pay periods of the member's participation.

Effective July 1, 2017 modifications to the average monthly salary computation are as follows: For pre-July 1, 2017 members, highest 78 pay periods are used to determine the benefit on retirement. Applicable pay periods considered prior to July 1, 2017 include overtime (OT), while applicable pay periods considered after July 1, 2017 exclude OT and applicable pay periods are capped at highest tested ranks salary. For post July 1, 2017 members, last 78 pay periods (OT excluded) and applicable pay periods are capped at highest tested ranks salary.

For members after July 1, 2017 the rule of 70 applies. For example, a member who has 20 years of service must be 50 years of age to retire since 50 (years of age) plus 20 (years of service) equal 70. Effective July 1, 2017 the member contribution rate increased from 9% to 10.50%. Modifications to accrual rates effective July 1, 2017 are as follows: (1) for pre-July 1, 2017 members, service years 1-20 before July 1, 2017: 2.5% per year; (2) for pre-July 1, 2017 members, service years after 20th year before July 1, 2017: 3% per year; (3) for pre-July 1, 2017 members, service years 1-20 after July 1, 2017: 2.75% per year; (4) for pre-July 1, 2017 members, service years after 20th year after July 1, 2017: 2.00% per year; (5) for post July 1, 2017 members service years 1-20: 2.25%; (6) for post July 1, 2017 members, service years after 20th year: 2.00% per year (7) capped at 80% for future members only, there is no benefit percentage cap for members pre-July 1, 2017.

Prior to July 1, 2017, pension payments were adjusted annually for a fixed annual cost-of-living adjustment (COLA) of 3% for eligible benefit recipients (age 48 and over) and members on a general on-duty disability, regardless of age. COLA benefits were suspended for FY18-FY20 for all members except for members age 70+ and those on a general disability pension, regardless of age. Those members are entitled to receive a COLA equal to the 5-year average of the Fund's smoothed investment return minus 5% for FY18 and FY19 and are entitled to receive a COLA equal to the 5-year average of the Funds' smoothed investment return minus 4.75% for FY20 and later fiscal years. Effective FY21 and beyond, retirees 55 years or older are entitled to a COLA equal to the most recent 5-year smoothed investment return minus 4.75%. After July 1, 2017, all COLAs have a floor of 0% and a max of 4% and birthday COLAs are no longer granted. Active Deferred Retirement Option Plan (DROP) participants are not eligible for a COLA.

Active members with 20 or more years of service and hired prior to July 1, 2017, are eligible to elect to establish a notional DROP account. When the DROP election becomes effective, a notional DROP account is established for the member and is credited with the following amounts: the monthly pension allowance determined as if the member had left active service on the DROP effective date; amounts equal to the deductions made from the DROP participant's (or member's) salary under Section 13(c) of the Act (9% of the member's salary after June 30, 2004); and earnings on those amounts, compounded monthly at a rate based on the Fund's actual average rate of return over the preceding five years. A member may participate in the DROP for a maximum of ten years (see subsequent changes to maximum allowable DROP participation below). The participant's monthly benefit at actual retirement would be increased by 2% of original monthly benefit for every full year of DROP participation. (Beginning September 1, 2000, the percentage increase applied to monthly benefits at actual retirement was 1%, to be phased in at 0.5% beginning on September 1, 2000, and an additional 0.5% beginning September 1, 2001. The benefit increase was then changed effective September 1, 2001 to 2% per year.) A member may continue to be employed as a firefighter by the City after 10 years of participation in the DROP; however, the 9% deducted from the member's salary, the monthly pension allowance, and the earnings calculation would no longer be credited to the member's account. Effective September 1, 2003, the following three changes to the DROP were implemented: (1) the one percent annual administrative fee for retired members with DROP balances was removed; (2) a 5% floor and a 10% ceiling on annual DROP earnings rates was implemented; and (3) widows of deceased members with DROP account balances may choose to leave the DROP accounts with the Fund. Effective May 18, 2007, the following two changes to the DROP were implemented: (1) DROP participants have the option to designate one or more adult children as eligible children with respect to survivor benefits for the member's DROP funds; and (2) DROP participants receive a pro-rated portion of the 2% increase applied to the original benefit at retirement for completed months in the final year of DROP participation (0.166% per month). On November 1, 2007, the DROP period was extended to 13 years, with certain modifications for DROP years 11 to 13. The monthly pension contributions made by the member will not be posted to the DROP account after the tenth year of DROP participation. Upon retirement, the member will not receive the 2% per year calculation beyond the tenth year (maximum 20% of original benefit will be added to monthly DROP Benefit upon retirement). The 2% recalculation of monthly benefit while in DROP remains for those members in DROP as of July 1, 2017 or those that have at least 20 years of service as of July 1, 2017 (Max is 20%). The DROP participant will continue to receive the monthly benefit and earnings in the DROP account for DROP years 11, 12 and 13.

Effective July 1, 2017, the following modifications have been made to DROP: (1) Members hired before July 1, 2017 may participate in DROP for 13 years; (2) Member Contributions will not be credited to their DROP account; (3) DROP interest credit is credited to DROP account even if member remains in active service past the maximum DROP time allowed (13 years); however monthly benefit will cease if member remains active beyond 13th year in DROP; (4) DROP option is closed for firefighters hired on or after July 1, 2017; (5) DROP interest is based on 65% of the previous 5 year compounded average annual return with a minimum of 2.5% and no maximum ceiling; (6) Unused leave pay (mustering out pay) will be placed in member's DROP if member has an active account; and (7) Current 2% recalculation of monthly benefit while in DROP remains for those in DROP as of July 1, 2017 or those that have at least 20 years of service as of July 1, 2017 (Max is 20%). The balance of the DROP account as of June 30, 2022 and 2021 was $1,284,098,230 and $1,226,579,127, respectively. The Post Retirement Option Plan (PROP) account balances as of June 30, 2022 and 2021 was $35,837,873 and $36,514,693, respectively.

Members or beneficiaries of members receiving pension or disability benefits (other than deferred retirees, survivors of deferred retirees, or active members who have elected the DROP) shall receive an additional monthly benefit payment of $150 along with their standard monthly benefit payment.

The Fund established a PROP which became effective October 1, 2007. This benefit allows retired members and survivors who are receiving service retirement benefits or taxable disability pension benefits to have a portion of his or her monthly service pension or other taxable benefits issued by the Fund credited to a notional PROP account. However, after July 1, 2017, no additions or contributions are allowed to the PROP. The notional PROP account shall be credited with earnings in the same manner as the Fund's DROP program.

Effective July 1, 2000 a benefit enhancement was enacted by the Board under Section 10 of the Act to allow members or beneficiaries of members receiving pension, disability, or death benefits (other than deferred retirees, survivors of deferred retirees, or active members who have elected the DROP) to receive a supplemental benefit payment each January. The aggregate amount of the annual supplemental benefit payment may not exceed $5 million in any one year and to receive the annual supplemental benefit payment, the retired member or eligible survivors must have been receiving benefits on June 30 of the year preceding the year in which the annual supplemental benefits are to be paid. The amount of the benefit enhancement that an individual receives is based on date of retirement and the amount of annual retirement benefit in comparison to an annual minimum income level.

DISABILITY BENEFITS

Service-connected disability benefits are 50% of average monthly salary (occupational), or 75% of average monthly salary (general), or the service retirement, if it is greater and if the member is eligible. Non service-connected disability benefits amount to 25% of average monthly salary, plus 2.5% of average monthly salary for each full year of service, up to a maximum of 50% of average monthly salary, or the service retirement, if it is greater and if the member is eligible.

DEATH BENEFITS

Death benefits are available to a surviving spouse, dependent children or dependent parents. Line-of-duty death benefits are payable at 100% of member's average monthly salary. If an active member dies who is eligible for a service, disability, or deferred pension, the member's eligible survivors are entitled to death benefits equal to the benefits the member would have been entitled to. Post-retirement death benefits are equal to the benefits being paid to the member upon his or her death. If there are no eligible survivors, the Fund will refund to the member's designated beneficiary or estate the amount of the member's contributions, with 5% simple interest, not compounded, for members with at least 10 years but less than 20 years of service and without interest for members with less than 10 years of service.

VESTING

Members who terminate employment with at least 10 years of service, but prior to becoming eligible for the service retirement, are entitled to 1.7% of their average monthly salary for each year of service, payable beginning at age 50, or an optional refund of contributions with simple interest at 5%.

Effective July 1, 2017 the following modifications have been made to Refund of Contributions and Deferred payments (1) members with at least 10 years of participation but less than 20 may elect a refund of contributions, with interest computed at 5% simple interest for member's contributions to the Fund made before July 1, 2017 and without interest for the members contributions to the Fund made on or after July 1, 2017; (2) Members hired prior to July 1, 2017 still have a Deferred Pension Option; and (3) Deferred Pension Option is closed for members hired on or after July 1, 2017.

Members who terminate their employment with less than 10 years of service may receive a refund of their contributions to the Fund, without interest. Members who terminated their employment prior to September 1, 1987 and prior to retirement for reasons other than death or disability forfeit their accumulated Fund benefits, including their contributions to the Fund.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

BASIS OF PRESENTATION

The accompanying basic financial statements are presented in accordance with generally accepted accounting principles established by the Governmental Accounting Standards Board (GASB), which designates accounting principles and financial reporting standards applicable to State and local governmental units. The accompanying basic financial statements include solely the accounts of the Fund, which include all programs, activities and functions relating to the accumulation and investment of the net 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

The economic resources measurement focus basis of accounting is the method by which revenues and expenses are recognized in the accounts and reported in the basic financial statements. The accrual basis of accounting is used by the Fund. Under the accrual basis of accounting, revenues, which include contributions and investment income, are recognized when they are earned and collection is reasonably assured, and expenses are recognized when the liability is incurred. Member and employer contributions are recognized when due, pursuant to formal commitments according to Fund requirements and State statute. Benefits paid to members and contribution refunds are recognized when due and payable in accordance with the terms of the Fund. Accrued income, when deemed uncollectable, is charged to operations.

REPORTING ENTITY

The Fund is a component unit of the City and its basic financial statements and required supplementary information are included in the City's Comprehensive Annual Financial Report.

USE OF ESTIMATES

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the basic financial statements and the reported amounts of revenues and expenses during the reporting period. Accordingly, actual results could differ from those estimates.

CASH AND CASH EQUIVALENTS

The Fund considers only demand deposits as cash. Cash equivalent securities, which are composed of all highly liquid investments with a maturity of 90 days or less when purchased, are considered to be cash equivalents.

INVESTMENT VALUATION AND INCOME RECOGNITION

The Board has contracted with BNY Mellon (Custodian) to serve as custodian of the assets of the Fund. The Custodian has established and maintains a custodial account to hold, or directs its agents to hold, for the account of the Fund, certain assets that the Board deposits with the Custodian from time to time. The Custodian also serves as the record-keeper of non-custody assets (commingled/multi-investor funds managed by third-party managers, private equity and real estate). All rights, title and interest in and to the Fund's assets at all times vests with the Fund's Board.

In performing its contractual duties, the Custodian is to adhere to a fiduciary standard of care, skill, prudence and loyalty, as measured by the high commercial standards reasonably expected of prudent professional custodians of public pension funds who are held in the highest repute or who hold themselves out as such. Further, in performing these duties, the Custodian is to exercise the same care and diligence that a professional custodian engaged in the banking or trust company industry and having professional expertise in financial and securities processing transactions and custody would observe in these affairs.

Investments are reported at fair value. Directly held securities that trade on national or international exchanges are priced by the Custodian and are based primarily on prices from several third-party vendors. Data received from vendors is checked to test for possible errors, which are researched manually by the Custodian. Default values established by the Custodian are applied for missing and stale prices. Prices of these securities reported by external managers are reconciled vis-à-vis this process by the Custodian. Short-term investments held by the Fund are government and corporate bonds with a maturity of less than three years and are valued at cost which approximates fair value. Timber investments are valued by the investment manager and are based on annual independent appraisals. Directly held real estate is valued based on independent appraisals. With the exception of certain energy related private equity investments that are valued on an income tax basis, private equity and real estate partnerships/trusts, hedge fund accounts and other commingled accounts are valued at fair value as determined by the investment manager in accordance with the investment's governing documents. Investments that do not have an established market may be reported at their estimated fair values as determined by the investment manager.

Directly held private equity assets (excludes real estate) are valued at historical cost unless appraised by a third-party. If a third-party has made such an appraisal, the appraised value is used. As of June 30, 2021 and June 30, 2020, these assets were valued at $1,075,000.

Unrealized gains and losses are presented as net appreciation (depreciation) in fair value of investments on the statements of changes in fiduciary net position, along with gains and losses realized on sales of investments. Purchases and sales of investments and forward foreign exchange contracts are recorded on the trade date and reported as a payable or receivable until settlement. Gains or losses are recognized when the contract is complete. Dividend income is recorded on the ex-dividend date. Interest and income from other investments are recorded as earned.

BUILDING, FURNITURE, FIXTURES AND EQUIPMENT

Building, furniture, fixtures, and equipment are recorded at cost less accumulated depreciation. Depreciation and amortization expense is computed using the straight-line method over the estimated useful lives of the related assets ranging from three to 30 years. Any gain or loss on the retirement of assets is recognized currently. Major outlays for additions and improvements are capitalized if equal to or greater than $5,000. Maintenance and repairs are charged to expense.

ADMINISTRATIVE EXPENSES

The cost of administering the Fund is paid by the Fund from current earnings pursuant to an annual fiscal budget approved by the Board.

FEDERAL INCOME TAX

The Fund received a favorable letter of determination dated November 15, 2016 from the Internal Revenue Service stating that the Fund qualifies as a tax-exempt plan and trust. The Fund's management and Board believe that the Fund is currently designed and being operated in compliance with the applicable requirements of the Internal Revenue Code.

Accounting principles generally accepted in the United States of America require Fund's management to evaluate tax positions taken by the Fund and recognize a tax liability (or asset) if the Fund has taken an uncertain position that more likely than not would not be sustained upon examination by the Internal Revenue Service. Fund management has analyzed the tax positions taken by the Fund, and has concluded that as of June 30, 2022 and 2021, there are no uncertain positions taken or expected to be taken that would require recognition of a liability (or asset) or disclosure in the basic financial statements. The Fund is subject to routine audits by taxing jurisdictions; however, there are currently no audits for any tax periods in progress.

RECENT ACCOUNTING PRONOUNCEMENTS

GASB Statement No. 87, *Leases*. The objective of this Statement is to meet the information needs of financial statement users by improving accounting and financial reporting for leases, enhancing the comparability of financial statements between governments, and also enhancing the relevance, reliability (representational faithfulness), and consistency of information about the leasing activities of governments. Under the previous guidance, leases were classified as either capital or operating depending on whether the lease met any of four tests. In May 2020, in light of the COVID-19 pandemic, this Statement was postponed and adopted for fiscal year 2022 financial statements, and the implementation of this new standard did not impact the Fund's financial statements.

GASB Statement No. 98, *The Annual Comprehensive Financial Report*. This Statement establishes the term annual comprehensive financial report and its acronym ACFR. The new term and acronym replace instances of Comprehensive Annual Financial Report and its acronym in generally accepted accounting principles for state and local governments. This Statement was developed in response to concerns raised by stakeholders that the common pronunciation of the acronym for Comprehensive Annual Financial Report sounds like a profoundly objectionable racial slur. This Statement's introduction of the new term is founded on a commitment to promoting inclusiveness. This Statement was adopted for fiscal year 2022 financial statements, and the implementation of this new standard did not impact the Fund's financial statements.

3. NET PENSION LIABILITY OF EMPLOYERS

NET PENSION LIABILITY ($000)

The components of the net pension liability at June 30, 2022, were as follows:

Total pension liability	$ 4,963,438
Fund fiduciary net position	(5,093,736)
City net pension liability	$ (130,298)
Fund fiduciary net position as a percentage of total pension liability	102.63%

ACTUARIAL ASSUMPTIONS

The actuarial cost method used to develop the total pension liability is the Entry Age Normal Cost-Level Percent of Pay method, as required by GASB Statement No. 67.

The total pension liability as of June 30, 2022 was determined by rolling forward the Fund's total pension liability as of July 1, 2021 to June 30, 2022 using the following actuarial assumptions, applied to all periods included in the measurement.

The Fund's staff recommended the use of the Board adopted 7.25% per annum rate of investment return assumption.

All other methods and assumptions used to determine the total pension liability are consistent with the assumptions used for the July 1, 2021 Risk Sharing Valuation Study.

The long-term expected rate of return on the Fund's investments was supported using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net 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 rates of return for each major asset class included in the pension plan's target asset allocation as of June 30, 2022 are summarized in the following table (note that the rates shown include the inflation component):

TARGET ALLOCATIONS

Asset Class	Long-Term Expected Rate of Return	Target Asset Allocation
Cash & Short Term	2.38%	2.00%
Public Equity-Domestic	9.39%	19.00%
Public Equity-International	8.47%	19.00%
Aggregate Bonds	3.19%	5.00%
Intermediate Credit	3.19%	3.00%
Intermediate High Yield	6.57%	5.00%
Hedge Funds	7.16%	2.00%
Private Equity	12.49%	25.00%
Private Debt	6.57%	10.00%
Real Estate	6.64%	10.00%

DISCOUNT RATE

The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed that the Fund's contributions will continue to follow the current funding policy. Based on those assumptions, the Fund's fiduciary net position was projected to be available to make all projected future benefit payments of current Fund members for all future years and hence, the blended GASB discount rate is equal to the long-term rate of return of 7.25%. Therefore, the long-term expected rate of return on Fund investments of 7.25% was applied to all periods of projected benefit payments to determine the total pension liability.

In the event of benefit payments not covered by the Fund's fiduciary net position, a municipal bond rate of 4.09% would be used to discount the benefit payments not covered by the System's fiduciary net position. The 4.09% rate equals the S&P Municipal Bond 20-Year High Grade Rate Index at June 30, 2022. The rate was 2.18% as of June 30, 2021.

SENSITIVITY OF THE NET PENSION LIABILITY TO CHANGES IN THE DISCOUNT RATE

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

	1% Decrease (6.25%)	Current Discount Rate (7.25%)	1% Increase (8.25%)
Net Pension Liability ($000)	$ 378,336	$ (130,298)	$ (550,549)

4. CONTRIBUTIONS REQUIRED AND CONTRIBUTIONS MADE

The Fund's statute (Vernon's Civil Statutes, Title 109, section 6243e.2(1)) requires the Fund and the City of Houston to independently conduct annual Risk Sharing Valuation Studies (RSVS). The RSVS's must include state set assumptions. If the difference between the City and the Fund's employer contribution rate falls at or below 2%, the Fund's RSVS will be used to determine the employer contribution rate for the fiscal year. If the difference is greater than 2%, the actuaries must reconcile the rates until the difference falls within 2%. If it cannot be reconciled, the arithmetic average will be used. The annual RSVS will now be used to determine the City's contribution rate to the Fund.

Effective July 1, 2021, the City's determined contribution rate remained the same for fiscal year 2022 as it was for fiscal year 2021 (31.89%) as established pursuant to the annual RSVS. The fiscal year 2022 RSVS consisted of 15.00% of covered members' salaries (to pay normal costs), increased by 16.89% of amortization deficit of the actuarial accrued liability over a closed amortization period of 30 years effective July 1, 2015.

The effective members' contribution rate of 10.5% remained the same for fiscal year 2022 and 2021.

ACTUARIALLY DETERMINED CONTRIBUTION REQUIREMENTS	June 30, 2022*
Employer normal cost	$ 38,263,838
Member normal cost	30,941,552
Total normal cost	**$ 69,205,390**
Plus: Amortization of Deficit	
Actuarial accrued liability	43,087,674
Net contributions required	**$ 112,293,064**
Employer contributions actually made	$ 81,351,512
Pensionable Member contributions actually made	26,787,362
Non-Pensionable Member contributions actually made	4,154,190
Total contributions	**$ 112,293,064**

** Based on the arithmetic average of the Fund and the City of Houston's RSVS*

ACTUARIALLY DETERMINED CONTRIBUTION REQUIREMENTS	June 30, 2021*
Employer normal cost	$ 41,601,926
Member normal cost	29,873,223
Total normal cost	**$ 71,475,148**
Plus: Amortization of Deficit	
Actuarial accrued liability	35,893,280
Net contributions required	**$ 107,368,429**
Employer contributions actually made	$ 77,495,206
Pensionable Member contributions actually made	25,517,568
Non-Pensionable Member contributions actually made	4,355,655
Total contributions	**$ 107,368,429**

** Based on the arithmetic average of the Fund and the City of Houston's RSVS*

ACTUARIAL PROCESS

The Fund, by statute, may adopt an actuarial valuation once every three years. The Texas Pension Review Board has determined that the annual RSVS satisfies this statutory requirement.

In May 2017, the Board of Trustees adopted and certified the finalized July 1, 2016 actuarial valuation. The July 1, 2016 actuarial report indicates the Fund has a funding ratio of 80.6%.

The Board adopted the July 1, 2016 actuarial valuation after careful consideration and analysis of an independent experience study. It should be noted that the Actuarial Value of Assets is based on the difference between the actual rate of return and the 7.25% assumed rate of return recognized in the actuarial value over five years beginning July 1, 2014.

The adoption of the July 1, 2016 actuary valuation for financial statement reporting purposes included the following changes in assumptions and methods since the prior year: a) the mortality rates applicable to active and non-disabled participants are based on the PR-2000 table projected 10 years from the valuation date. Therefore, the mortality rates have been updated from the PR-2000 table projected to 2026 using Scale AA. This increased the actuarial accrued liability by approximately $4 million. b) the assumed investment rate of return was changed from 8.5% to 7.25%. This change increased the actuarial accrued liability by approximately $504 million.

Accounting standards require that the statement of fiduciary net position state assets at fair value, and include only benefits and refunds due Fund members and beneficiaries, as well as accrued investment and administrative expenses as of the reporting date.

The Fund's governing statute limits the City's contribution to within a range of plus or minus 5% of 31.89% of pensionable payroll to pay the Fund's benefits. If the City's contributions are determined to not be within the range, the governing statute provides that certain adjustments shall be made.

The July 1, 2016 actuarial valuation used the following significant assumptions:

Investment rate of return	**7.25%, net of expenses**
Salary increases	**3% to 7%, based on seniority and merit**
Payroll growth rate	**3% per year**
General inflation rate	**3% per year**
Cost of living adjustment	**3% annually**
Actuarial cost method	**Entry age method**
Amortization method	**Level percentage of payroll over a closed amortization period 30 years effective July 1, 2015**
Life expectancy	**Based on RP-2000 Table projected to year 2026 using scale AA**

HISTORICAL TREND INFORMATION

Historical trend information is provided as required supplementary information on pages 42 through 49. This information is intended to demonstrate progress the Fund has made in accumulating sufficient assets to pay benefits when due and the related actuarial assumptions used in determining the actuarially determined amounts.

5. INVESTMENTS

Statutes of the State of Texas authorize the Fund to invest surplus funds in the manner provided by the Government Code, Title 8, Subtitle A, Subchapter C. This subchapter provides for the investment of surplus assets as described in section 802.202 of the Government Code. The Board seeks to produce a return on investments that is based on prudent and reasonable investment risk and the cash flow requirements of the Fund given prevailing economic and capital market conditions. While the Board recognizes the importance of the preservation of capital, it also adheres to the theory of capital market pricing which maintains that varying degrees of investment risk should be rewarded with incremental returns. Consequently, prudent risk-taking is justifiable.

The Board manages the investment program of the Fund in compliance with all applicable Federal and State statutes and regulations concerning the investment of pension assets.

The Board has adopted an Investment Policy Statement (Investment Policy) to set forth the factors involved in the management of investment assets for the Fund. The Board has established an Investment Committee to act on all matters related to investments.

The fair values of the Fund's investments as of June 30, 2022 and 2021, by type, are as follows:

	2022	2021
Short-term Investment Funds	$ 124,441,551	$ 160,416,145
Fixed Income-Government Securities	18,843,648	127,776,917
Fixed Income-Corporate Bonds	565,433,003	693,934,305
Fixed Income-Convertibles	854,023	3,490,302
Common Equity	1,649,941,112	2,061,653,985
Preferred Equity	-	674,442
Hedge Funds:		
Equity Hedge Funds	-	20,274,136
Global Macro Hedge Fund	130,204,919	151,707,497
Inflation Hedge Fund	79,932,019	81,030,668
Multi-Strategy FOHFs	762,132	692,470
Private Debt	190,970,112	97,629,387
Private Equity:		
Buyout Partnerships/Funds	868,855,049	842,311,229
Co-Investments	208,950,459	139,844,570
Digital Assets	6,992,433	-
Distressed Debt Partnerships/Funds	67,070,775	48,734,601
Direct Investments	1,075,000	1,075,000
Infrastructure Partnerships/Funds	80,257,951	48,468,330
Mixed Strategies	55,405,104	42,591,227
Secondary Partnerships/Funds	212,206,438	180,191,392
Special Situations Investments	110,823,412	76,256,139
Venture Capital Partnerships/Funds	193,218,453	154,908,979
Real Estate	341,345,504	308,459,008
Total investments	**$ 4,907,583,097**	**$ 5,242,120,729**

CUSTODIAL CREDIT RISK

Portions of the Fund's investments are classified as security investments. A security is a transferable financial instrument that evidences ownership or creditorship. Investments in companies, partnerships and real estate are investments that are evidenced by contracts rather than securities.

Custodial credit risk disclosures relate to securities. Custodial credit risk is the risk that, in the event of the failure of the counterparty, the Fund will not be able to recover the value of its securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities are (i) uninsured, (ii) not registered in the name of the Fund, and (iii) are held by either the counterparty or the counterparty's trust department or agent but not in the Fund's name. At June 30, 2022 and 2021 the Fund's security investments (excluding cash) that were not subject to custodial credit risk were the investments not registered on an exchange.

CONCENTRATION OF CREDIT RISK

Concentration of credit risk is the risk of loss attributable to the magnitude of the Fund's investment in a single issue. The allocation of assets among various asset classes is set by the Board with the objective of optimizing the investment return of the Fund within framework of acceptable risk and diversification. For major asset classes (e.g., domestic equities, international equities, fixed income hedge funds, digital assets, private debt, private equity and real estate), the Fund further diversifies by employing investment managers who implement the strategies selected by the Investment Committee (IC). In addition, Exchange Traded Funds (ETFs) may be used.

Significant risk management asset allocation guidelines are as follows:

1) Investment Manager investment philosophy, style, strategy, and structure shall remain consistent and shall not change without the IC's approval. The Investment Manager shall have discretion to manage the portfolio consistent with the agreement(s) governing the Investment Manager's activity for the Fund, the style presented to the IC at the time of selection, or as revised by the IC, and further subject to the restrictions established by the policy herein.

2) The following transactions are prohibited by a fiduciary manager subject to an Investment Management Agreement (IMA) acting directly on behalf of the Fund: short sales, selling on the Fund's margin, put and call options and the use of derivatives, unless expressly authorized by the IC by vote as to a particular manager, which authorization may be revoked as to new activity.

3) To the extent that any broker, custodian or other Investment Manager would be engaged in a transaction with the Fund in a capacity as a counterparty to the Fund (whether as a principal or on behalf of any other third party or any affiliate), such broker, custodian or other Investment Manager shall promptly disclose such transaction to the Fund and act in a manner that is fair and reasonable in all respects. Transactions shall be executed at competitive cost or best execution.

Specific guidelines for each Investment Manager shall be developed and negotiated by the Fund's investment staff and legal counsel and shall be incorporated into an IMA, and/or other binding written agreement as is appropriate for the investment.

Quantitative and qualitative performance measures, as well as Investment Manager adherence to applicable guidelines, shall be monitored as are appropriate to each investment. In the case of a conflict between the specific guidelines and the general guidelines, the specific guidelines shall supersede, or be accorded primary weight in any reconciliation.

As of June 30, 2022, more than 5% of the Fund's net assets were in the BlackRock Russell 3000 Fund (8.75%), BNYM Newton Dynamic Global ex-U.S. Equity Fund (8.27%), BNYM Mellon ACWI Ex-U.S. Fund (6.18%), BNYM Newton Dynamic U.S. Equity Russell 3000 Fund (6.06%), and KKR Global Credit Opportunities Fund (5.88%). As of June 30, 2021, more than 5% of the Fund's net assets were in the Mellon Dynamic ex-U.S. Equity Fund (10.82%), Mellon Dynamic U.S. Equity Fund (7.39%), KKR Global Credit Opportunities Fund (6.95%), Mellon ACWI Ex-U.S. Fund (6.26%), and Mellon Broad Market Stock Index Fund (6.21%).

INTEREST RATE RISK

The Fund invests in fixed income securities including, but not limited to, investments representing instruments with an obligated fixed rate of interest including public and private debentures, mortgages, investments in life insurance general accounts and guaranteed investment contracts, with maturities greater than one year, and options/futures. Instruments may have an investment grade or non-investment grade rating. Purchases and sales, investment selection and implementation of investment strategies are delegated to the discretion of external investment managers, subject to compliance with its investment management agreement and the Fund's Investment Policy.

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of the investment. Interest rate risk is the greatest risk faced by an investor in the fixed income market. The price of a fixed income security typically moves in the opposite direction of the change in interest rates. The weighted average maturity expresses investment time horizons (when the investment comes due and payable) in years, weighted to reflect the dollar size of individual investments within the investment type. The Fund does not have a formal investment policy that limits investment maturities as a means of managing its exposure to potential fair value losses arising from future changes in interest rates, but rather mandates such limits within the external manager's investment management agreement.

At June 30, 2022, the following table shows the Fund's investments by type, with weighted average maturity and fair value:

	WEIGHTED AVERAGE MATURITY	FAIR VALUE
Commingled Funds	5.01	$ 299,479,447
Non-U.S. Convertibles	0.96	205,325
Non-U.S. Corporate	3.43	46,689,625
Non-U.S. Treasuries	11.63	264,728
Taxable Municipals	20.69	2,829,051
U.S. Agencies	29.59	6,807,253
U.S. Collateralized	10.60	450,158
U.S. Convertibles	2.78	648,698
U.S. Corporate	3.16	218,911,719
U.S. Treasuries	15.99	8,844,670
Total Fixed Income Securities		**$ 585,130,674**

At June 30, 2021, the following table shows the Fund's investments by type, with weighted average maturity and fair value:

	WEIGHTED AVERAGE MATURITY	FAIR VALUE
Commingled Funds	3.02	$ 365,300,980
Non-U.S. Collateralized	20.92	697,345
Non-U.S. Convertibles	21.97	400,842
Non-U.S. Corporate	6.78	76,595,597
Non-U.S. Treasuries	18.07	3,847,300
Taxable Municipals	15.48	7,167,425
U.S. Agencies	27.29	31,485,957
U.S. Collateralized	17.51	10,110,533
U.S. Convertibles	9.38	3,089,460
U.S. Corporate	6.22	241,229,850
U.S. Treasuries	12.79	85,276,235
Total Fixed Income Securities		**$ 825,201,524**

CREDIT RISK

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The Fund does not have a formal policy limiting investment credit risk, but rather mandates such limits within the investment management agreement of each manager as may be appropriate to strategy. The Fund's exposure to investment credit risk in fixed income securities (which includes government securities, corporate bonds, convertibles) as of June 30 are as follows:

	2022		2021	
Quality Rating	**Fair Value**	**Percentage of Holdings**	**Fair Value**	**Percentage Of Holdings**
AGY	$ 6,807,254	0.14%	$ 31,485,957	0.60%
AAA	1,822,818	0.04%	4,459,390	0.09%
AA1	-	0.00%	185,328	0.00%
AA2	435,078	0.01%	926,148	0.02%
AA3	2,952,183	0.06%	8,513,587	0.16%
A1	552,927	0.01%	7,377,237	0.14%
A2	4,223,237	0.09%	39,891,110	0.76%
A3	3,631,428	0.07%	39,481,607	0.75%
BAA1	7,163,495	0.15%	60,310,715	1.15%
BAA2	7,226,411	0.15%	49,413,494	0.94%
BAA3	8,496,194	0.17%	39,562,854	0.75%
BA1	19,319,298	0.39%	6,122,826	0.12%
BA2	24,517,713	0.50%	6,326,067	0.12%
BA3	62,607,343	1.28%	5,864,812	0.11%
B1	33,266,041	0.68%	5,311,606	0.10%
B2	24,370,940	0.50%	6,170,902	0.12%
B3	18,216,715	0.37%	5,511,932	0.11%
B	-	0.00%	365,300,980	6.97%
CAA1	310,827,540	6.33%	3,665,549	0.07%
CAA2	4,920,023	0.10%	1,832,316	0.03%
CAA3	-	0.00%	334,758	0.01%
CA	-	0.00%	70,756	0.00%
Not rated	34,929,366	0.71%	51,805,358	0.99%
Total credit risk debt securities*	**$ 576,286,004**	**11.75%**	**$ 739,925,289**	**14.11%**

**Obligations of the U.S. government or obligations explicitly guaranteed by the U.S. government are not considered to have credit risk and therefore, have not been included in this disclosure.*

FOREIGN CURRENCY RISK

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or a deposit. Realized and unrealized gains and losses on investments which result from changes in foreign currency exchange rates have been included in the net appreciation (depreciation) in fair value of investments. The Fund's policy allows external investment managers to decide what action to take regarding their respective portfolio's foreign currency exposures subject to compliance with its respective investment management agreement of each manager as may be appropriate to strategy the Fund's Investment Policy Statement. The Fund's exposure to foreign currency fluctuation as of June 30 are as follows:

	2022		2021	
	Fair Value	Percentage of Holdings	Fair Value	Percentage Of Holdings
EURO CURRENCY UNIT	$ 234,722,073	4.78%	$162,201,469	3.09%
MEXICAN PESO	0	-	521,300	0.01%
INDIAN RUPEE	0	-	240,459	0.00%
BRAZIL REAL	0	-	120,860	0.00%
NORWEGIAN KRONE	0	-	497	0.00%
Total securities subject to foreign currency risk	**$ 234,722,073**	**4.78%**	**$ 163,084,585**	**3.10%**

ALTERNATIVE INVESTMENTS

As of June 30, 2021 and 2020, the Fund was invested in various private equity funds and hedge funds as detailed in the following chart:

FAIR VALUE OF THE FUND'S INTEREST		
Investment Type	June 30, 2022	June 30, 2021
Private Debt	$ 190,970,112	$ 97,629,387
Private Equity	1,797,862,641	1,534,381,467
Hedge Funds	210,899,070	253,704,771
	$2,199,731,823	**$ 1,885,715,625**

The Fund has a mature private equity portfolio diversified by vintage year, strategy, and manager.

In regard to hedge funds, as of June 30, 2022, the Fund had investments in one global macro hedge fund and one multi-strategy fund-of-hedge funds.

Hedge Funds are managed portfolios of investments using advanced investment strategies such as leverage, long, short and derivative positions in both domestic and international markets with the goal of generating uncorrelated positive returns over a specified market benchmark. For the most part, hedge funds are unregulated and carry liquidity restrictions for redemption. The Fund's staff monitors risk, guidelines and compliance.

The use of derivatives in a portfolio gives rise to various types of risks. The primary types of risk include market risk, liquidity risk, counterparty risk and operations risk.

Market Risk - Represents the risk of adverse movements in markets (including asset prices, volatility, changes in yield curve, implied option volatility or other market variables/forces) for the derivatives or the underlying asset, reference rate or index to which the derivative relates. "Interest rate risk" is a type of market risk.

Liquidity Risk - There are generally two types of liquidity risk. The first is the risk that a responsible party may not be able to, or cannot easily, unwind or offset a particular position risk at or near the previous market price, because of inadequate market depth or because of disruptions in the market place. The second is the risk that the portfolio will not be able to meet its future financial obligations resulting from its derivative activities, such as margin calls on futures contracts.

Counterparty Risk - Is the risk that a counterparty (the other party with whom a derivatives contract is made) will fail to perform contractual obligations (i.e. default in either whole or part) under a contract and that this failure occurs at a time when the contract is in-the-money. This is also sometimes referred to as "credit risk".

Operations Risk - Is the risk that deficiencies in the effectiveness and accuracy of the information or internal controls will result in a material loss. This risk is associated with human error, Fund failures and inadequate procedures and internal management controls.

DERIVATIVE INVESTING

The Fund's investment managers may invest in derivatives as permitted by the investment management agreement of each manager as may be appropriate to strategy and the Fund's Investment Policy Statement. Derivatives are generally defined as contracts whose values depend on, or are derived from, the value of an underlying asset, reference rate or index. The Fund's exposure to derivatives may be indirect by way of the Fund's investments in commingled fund vehicles or directly held in separate accounts, if permitted.

As of June 30, 2022 and 2021, the Fund held no derivative investments directly.

FORWARD FOREIGN EXCHANGE CONTRACTS

A currency forward is a contractual agreement between two parties to pay or receive specific amounts of foreign currency at a future date in exchange for another currency at an agreed upon exchange rate. Forward foreign exchange contracts are recorded on the trade date and reported as a payable or receivable until settlement. Recognition of realized gain or loss depends on whether the currency exchange rate has moved favorable or unfavorable to the contract holder upon termination of the contract. Prior to termination of the contract, the Fund records the unrealized currency translation gain or loss based on the applicable forward exchange rates.

The fund reported a loss of $96,290 in fiscal year 2022 and a loss of $129,697 in fiscal year 2021.

As of June 30, 2022 and 2021, the Fund held no positions in foreign exchange contracts.

Forward commitments are not standardized and carry credit risk due to the possible nonperformance by one of the counter parties. The maximum potential loss is the aggregate face value in U.S. dollars at the time the contract was opened; however, the likelihood of such loss is remote.

No active investment manager was employed by the Fund during fiscal year 2022 or 2021 for the sole purpose of managing foreign currency risk. External investment managers, investing on the Fund's behalf, may enter into forward foreign currency contracts to facilitate security transactions in international markets.

Summary of Investment and Professional Services on page 47 lists the Fund's investment and professional service providers.

6. FAIR VALUE MEASUREMENTS

Investments are recorded at fair value in accordance with the GASB Statement No. 72, *Fair Value Measurement and Application*.

The Fund categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs other than quoted market prices for similar assets; Level 3 inputs are significant unobservable inputs.

The Fund has the following recurring fair value measurements as of June 30, 2022:

GASB 72 HIERARCHY TABLE

		FAIR VALUE MEASUREMENTS USING		
	6/30/2022	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 INVESTMENT FUNDS	$ 324,771,661	$ 324,771,661		
DEBT SECURITIES				
Government Securities	18,843,648	8,844,670	9,998,978	
Corporate bonds	44,740,384	13,840,979	30,899,405	
Convertibles	854,023		854,023	
TOTAL FIXED INCOME SECURITIES	64,438,055	22,685,649	41,752,406	
EQUITY SECURITIES				
Common	13,797,923	13,797,923		
TOTAL EQUITY SECURITIES	13,797,923	13,797,923		
INFLATION HEDGE SECURITIES				
Gold	79,932,019	79,932,019		
Total inflation hedge securities	79,932,019	79,932,019		
PRIVATE INVESTMENTS				
Private debt	22,505,049	22,505,049		
Private equity - energy	1,075,000			1,075,000
Real estate	1,170,000			1,170,000
Total private investments	24,750,049	22,505,049		2,245,000
Total Investments By Fair Value Level	$ 507,689,707	$ 463,692,301	$ 41,752,406	$ 2,245,000
Investments measured at net asset value (NAV)				
COMMINGLED INVESTMENT FUNDS	$ 1,956,505,698			
HEDGE FUNDS	130,967,051			
PRIVATE DEBT FUNDS	168,465,063			
PRIVATE EQUITY FUNDS	1,803,780,074			
REAL ESTATE FUNDS	340,175,504			
Total Investments Measured at NAV	4,399,893,390			
TOTAL INVESTMENTS	**$ 4,907,583,097**			

The Fund has the following recurring fair value measurements as of June 30, 2021:

GASB 72 HIERARCHY TABLE

		FAIR VALUE MEASUREMENTS USING		
	6/30/2021	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 INVESTMENT FUNDS	$ 160,416,145	$ 160,416,145		
DEBT SECURITIES				
Government Securities	127,776,917	85,276,235	42,500,682	
Corporate bonds	285,846,932	4,701,149	281,145,783	
Convertibles	3,490,302	336,965	3,153,337	
TOTAL FIXED INCOME SECURITIES	417,114,151	90,314,349	326,799,802	
EQUITY SECURITIES				
Common	49,879,673	49,879,673		
Preferred	674,442		674,442	
TOTAL EQUITY SECURITIES	50,554,115	49,879,673	674,442	
INFLATION HEDGE SECURITIES				
Gold	81,030,668	81,030,668		
Total inflation hedge securities	81,030,668	81,030,668		
PRIVATE INVESTMENTS				
Private equity - energy	1,075,000			1,075,000
Real estate	1,170,000			1,170,000
Total private investments	2,245,000			2,245,000
Total Investments By Fair Value Level	$ 711,360,079	$ 381,640,835	$ 327,474,244	$ 2,245,000
COMMINGLED INVESTMENT FUNDS	$2,419,861,685			
HEDGE FUNDS	172,674,103			
PRIVATE DEBT FUNDS	97,629,387			
PRIVATE EQUITY FUNDS	1,533,306,467			
REAL ESTATE FUNDS	307,289,008			
Total Investments Measured at NAV	$ 4,530,760,650			
TOTAL INVESTMENTS	**$ $5,242,120,729**			

Short-term investments held by the Fund classified in Level 1 are government and corporate bonds with a maturity of less than three years, and are valued at cost which approximates fair value. Debt and equity securities classified in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Debt and equity securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique. Matrix pricing is used to value securities based on the securities' relationship to benchmark quoted prices. Real estate classified in Level 3 includes real estate held directly by the Fund. The property was valued by an independent appraiser using the sales comparison method as of June 30, 2019. The private equity (energy) assets include an interest in the net operating profits of an investment management company. This interest is valued at its historical cost in the absence of significant observable inputs. It is uncertain if this position can be exited at its historical cost.

The valuation method for investments measured at the net asset value (NAV) per share (or its equivalent) is presented on the following table.

At June 30, 2022, the following table shows the Fund's investments measured at the NAV:

	Fair Value	Unfunded Commitments	Redemption Frequency (if Currently Eligible)	Redemption Notice Period
COMMINGLED INVESTMENT FUNDS (A)	$ 1,956,505,698		*NR - Quarterly	0 - 90 days
HEDGE FUNDS (B)	130,967,051		*NR - Quarterly	0 - 60 days
PRIVATE DEBT FUNDS (C)	168,465,063	445,490,963		
PRIVATE EQUITY FUNDS (D)	1,803,780,074	1,154,317,885		
REAL ESTATE FUNDS (E)	340,175,504	428,453,164		
Total Investments Measured at NAV	**$ 4,399,893,390**			

**NR is used to denote no contractual restriction*

At June 30, 2021, the following table shows the Fund's investments measured at the NAV:

	Fair Value	Unfunded Commitments	Redemption Frequency (if Currently Eligible)	Redemption Notice Period
COMMINGLED INVESTMENT FUNDS (A)	$2,419,861,685		*NR - Quarterly	0 - 60 days
HEDGE FUNDS (B)	172,674,103		*NR - Quarterly	0 - 60 days
PRIVATE DEBT (C)	97,629,387			
PRIVATE EQUITY FUNDS (D)	1,533,306,467	1,061,855,500		
REAL ESTATE FUNDS (E)	307,289,008	204,159,144		
Total Investments Measured at NAV	**$4,530,760,650**			

**NR is used to denote no contractual restriction*

A. COMMINGLED INVESTMENT FUNDS

This type includes eleven commingled (multi-asset) accounts managed by six separate managers. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. Three accounts are interests in funds that invest in U.S. and non-U.S. securities. Seven accounts are commingled investments funds that may invest in securities or other collective funds to track the perfomance of their respective public market index. The last of these accounts is a global tactical asset allocation account, a portion of which is invested in U.S and non-U.S collective investment trusts.

B. HEDGE FUNDS

As of June 30, 2022, this type includes one global macro hedge fund and one multi-strategy fund-of-hedge funds. These funds pursue multiple 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. The global macro hedge fund has a monthly redemption allowance and five business day notice period. While the fund-of-hedge funds does not have redemption gates, the Fund's ability to effect withdrawals is dependent on the fund-of-hedge fund's ability to redeem its interests in underlying positions. That said, in June 2016, the Investment Committee terminated the fund-of-hedge funds. Consequently, on the instruction of the Fund, the manager initiated redemption actions in August 2016. As of June 30, 2022, HFRRF has received over 99% of the expected proceeds. Other than seeking and executing redemptions, the fund-of-hedge funds manager is not actively trading on behalf of the Fund. Subsequent redemption proceeds received by the Fund will be determined by the NAV of the underlying positions liquidated by the manager, which may differ from the June 30, 2022 fair value of $762,131 due to market conditions.

C. PRIVATE DEBT FUNDS

As of June 30, 2022, this type includes nine private debt funds that invest globally in private assets and funds (or other funds that in turn invest in other private debt funds on a primary or secondary basis). The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the Fund's ownership interest in partners' capital. These investments can never be redeemed with the funds. Instead, the nature of the investments in this type is that distributions are received through the liquidation of the underlying assets of the fund. It is expected that the underlying assets of the funds will be liquidated over 1 to 15 years.

D. PRIVATE EQUITY FUNDS

As of June 30, 2022, this type includes eighty-eight private equity funds that invest globally in private assets and funds (or other funds that in turn invest in other private equity funds on a primary or secondary basis) and one fund that invests in digital assets. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the Fund's ownership interest in partners' capital. While the digital assets fund may be redeemed with one day's notice, the private equity investments can never be redeemed with the funds. Instead, the nature of the investments in this type is that distributions are received through the liquidation of the underlying assets of the fund. It is expected that the underlying assets of the funds will be liquidated over 1 to 15 years.

E. REAL ESTATE FUNDS

As of June 30, 2022, this type includes forty real estate funds that invest globally in commercial real estate (or other funds that in turn invest in other real estate funds on a primary or secondary basis) and one fund that invests in U.S. timberland. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the Fund's ownership interest in partners' capital. These investments can never be redeemed with the funds. Distributions from each fund will be received as the underlying investments of the funds are liquidated. It is expected that the underlying assets of the funds will be liquidated over 1 to 15 years.

7. CASH AND CASH EQUIVALENTS

The Fund's deposits are held by the Custodian. As such, the Fund's cash deposits and cash equivalents beyond coverage by Federal depository insurance carries with it custodial risk; the risk that in the event of a bank failure, the Fund's deposits may not be returned to it. As of June 30, 2022 and 2021, the Fund's cash deposits in bank accounts totaled $62,187,492 and $6,101,892, respectively. These amounts are in demand deposit accounts subject to coverage by Federal depository insurance but not collateralized. The Fund's cash balances exceeded Federal depository insurance limits by $61,937,492 and $5,851,892 as of June 30, 2022 and 2021, respectively. The Fund does not have a deposit policy for custodial credit risk; however, management believes that the Fund's credit risk exposure for amounts not covered by Federal depository insurance is mitigated by the financial strength of the banking institution in which the deposits are held.

8. RECEIVABLES FOR INVESTMENTS SOLD

During June 2022, the Fund completed a secondary sale of Fund interests in multiple private market partnerships worth $190 million. Proceeds totaling $76 million were received on June 30, 2022. A portion of the sale proceeds are structured as a deferred payment and held as receivables totaling $114 million to be received on June 30, 2023.

9. LAND

In February 1998, the Fund purchased land for $483,325 to use in the construction of a new office building for its operations and its members. This land is not depreciated.

10. BUILDING, FURNITURE, FIXTURES AND EQUIPMENT

In April of 2001, the construction of the new building was completed. All capitalized costs associated with the building have been classified as building in the statements of fiduciary net position. This cost is being depreciated over 30 years. All other fixed assets are depreciated between 3 and 5 years.

Building, furniture, fixtures and equipment are comprised as follows at June 30, 2022:

	Beginning Balance	Increases	Decreases	Ending Balance
CAPITAL ASSETS BEING DEPRECIATED:				
Building	$ 9,940,771	$ 87,942	-	$ 10,028,713
Office furnishings and equipment	675,167	-		675,167
Computer software and hardware	3,210,002	38,471		3,248,473
Total assets being depreciated	13,825,940	126,413		13,952,353
LESS ACCUMULATED DEPRECIATION FOR:				
Building	(6,559,173)	(360,221)	-	(6,919,394)
Office furnishings and equipment	(616,983)	(11,735)		(628,718)
Computer software and hardware	(3,157,526)	(18,624)		(3,176,150)
Total accumulated depreciated	(10,333,682)	(390,580)		(10,724,262)
Total building, furniture, fixtures and equipment, net	**$ 3,492,258**	**$ (264,167)**		**$ 3,228,091**

Building, furniture, fixtures and equipment are comprised as follows at June 30, 2021:

	Beginning Balance	Increases	Decreases	Ending Balance
CAPITAL ASSETS BEING DEPRECIATED:				
Building	$ 9,911,015	$ 29,756	-	$ 9,940,771
Office furnishings and equipment	618,944	56,223		675,167
Computer software and hardware	3,210,002	-		3,210,002
Total assets being depreciated	13,739,961	85,979		13,825,940
LESS ACCUMULATED DEPRECIATION FOR:				
Building	(6,206,041)	(353,132)	-	(6,559,173)
Office furnishings and equipment	(613,682)	(3,301)		(616,983)
Computer software and hardware	(3,135,798)	(21,728)		(3,157,526)
Total accumulated depreciated	(9,955,521)	(378,161)		(10,333,682)
Total building, furniture, fixtures and equipment, net	**$ 3,784,440**	**$ (292,182)**		**$ 3,492,258**

11. SECURITIES LENDING ARRANGEMENTS

The Fund had the following securities on loan and held the following related cash collateral balances, at fair value, as of June 30:

	2022		2021	
	Securities Lent	Collateral Held	Securities Lent	Collateral Held
Fixed income	$ 25,026,312	$ 25,551,937	$ 38,041,785	$ 38,875,440
Common and preferred stocks	13,107,552	13,393,762	38,014,858	38,811,063
	$ 38,133,864	**$ 38,945,699**	**$ 76,056,643**	**$ 77,686,503**

Board policies, as filed with the Texas Pension Review Board, reflect the Fund's practice of lending its securities for the purpose of generating income from the investment of the related collateral. The Custodian as lending agent executes a securities lending program on behalf of the Fund.

Borrower credit risk is limited by the amount of collateral required. Concurrent with the loan, the collateral obtained is to equal 102% to 105% of the fair value (including any accrued interest) of the loaned securities. The percentage may vary within this allowance based on the types of securities lent. Thereafter, collateral value equaling 100% of the fair value of the loaned amount is to be maintained. Although security loans can be terminated on demand by the Fund, should the collateral value fall below 100% and the full value of the securities loaned not recovered, the Fund will incur losses. As of June 30, 2022 and 2021 the Fund was not exposed to borrower credit risk as collateral held as a percentage of the securities loaned was 102.1% and 102.1%, respectively. The securities lending income is divided between the Fund and the securities lending agent.

Borrower credit risk is also limited by the type of collateral permitted. Unless otherwise agreed by the Fund and the Custodian, collateral is to include U.S. dollars, securities issued or guaranteed by U.S. government entities, or irrevocable letters of credit issued by banks (independent of the borrower).

The collateral held at the Fund's Custodian is exposed to custodian credit risk. Collateral held had a fair value of $38,945,699 and $77,686,503 as of June 30, 2022 and 2021, respectively. Cash collateral from the securities lending program ($16,998,018 and $30,542,924 as of June 30, 2022 and 2021, respectively) is invested in the Custodian's collateral investment pools. These pools are not considered to be securities.

12. RELATED PARTY

During fiscal years 2022 and 2021, the Fund utilized the services of investment management companies in which the Fund owns an interest. Manager fees of approximately $1,059,070 and $1,073,000 were paid in fiscal years 2022 and 2021, respectively, to these companies.

13. BENEFIT PLANS

The Fund offers its employees a deferred compensation plan (the Plan) created in accordance with Internal Revenue Code 457. The Plan, available to all employees of the Fund, permits employees to defer a portion of their salary until future years. The deferred compensation is not available to employees until termination, retirement, death or unforeseeable emergency.

The Fund also offers its full-time employees a Profit Sharing Plan which is a qualified retirement plan under Section 401(a) of the Internal Revenue Code of 1986, as amended. The Fund maintains the Profit Sharing Plan to provide a tax-deferred way for it to contribute to its employees' savings for retirement, disability, death, and other major life events. The Fund contributes into the Profit Sharing Plan 16% of a participating employee's qualified yearly salary. During fiscal years 2022 and 2021, the Fund contributed $482,462 and $503,247 respectively, to the Profit Sharing Plan.

Both of the benefit plans are administered by an outside party, with the related amounts held in trust. Accordingly, these benefit plans are not reflected in the accompanying basic financial statements in accordance with GASB Statement No. 32.

14. COMMITMENTS AND CONTINGENCIES

As described in Note 1, certain members of the Fund are entitled to refunds of their accumulated contributions upon termination of employment with the City, prior to being eligible for pension benefits.

As of June 30, 2022 and 2021, aggregate contributions from active members of the Fund with less than ten years of service were $34,530,247 and $31,312,772, respectively. Contributions for employees with 10 to 20 years of service have not been determined. As of June 30, 2022 and 2021, interest payable related to these contributions has not been accrued.

The Fund had outstanding investment commitments to various limited partnerships and investment advisors of $2,028,262,012 and $1,266,014,644 as of June 30, 2022 and 2021, respectively. Not all committed capital is fully called.

Pursuant to the May 23, 1993 revision of Section 2(l), Chapter 432, Acts of the 64th Legislature, 1973 (Article 6243e.2, Vernon's Texas Civil Statutes), the Board may, from Fund assets, establish a self-insurance fund to pay certain claims for indemnification. On June 17, 1993, the Board voted to adopt this subsection allowing for the establishment of a self-insurance fund from Fund assets. The self-insurance fund is a designation of Fund net assets by the Board. As of June 30, 2022 and 2021, cumulative contributions made to the self-insurance fund by the Fund have been approximately $5,000,000.

The Fund is a party to various claims and legal actions arising in the ordinary course of its business which, in the opinion of management, will not have a material effect on the Fund's financial position.

15. RISKS AND UNCERTAINTIES

The Fund invests in various public and private investment securities. Investment securities are exposed to various risks such as interest rate risk, market risk, events risk, geopolitical risk, and credit risk. In FY 2022, the following risks impacted the portfolio, including continued negative social and economic impacts from the COVID pandemic, a land war between Russia and Ukraine, and a labor shortage. These events contributed to supply chain disruptions, food shortages, and increased inflation. This in turn led to 150 basis points of increase in the Federal Funds Rate from March-June 2022. The effect of these events on the Fund's investment portfolio is mitigated by the diversification of its holding defensive strategies, exposure to private assets, and tactical asset allocation.

However, it is at least reasonably possible that changes in the value of the Fund's investment securities may occur over the course of different economic and market cycles.

The Fund's contribution rates and the actuarial information included in the notes and Schedules 1 and 2 (unaudited) are based on certain assumptions pertaining to interest rates, inflation rates and participant demographics, all of which are subject to change. Due to uncertainties inherent in the estimations and assumptions process, it is at least reasonably possible that changes in these estimates and assumptions in the near term could be material to the financial statements.

16. SUBSEQUENT EVENTS

Management of the Fund has evaluated subsequent events through October 18, 2022, which is the date the financial statements were available to be issued. Management has determined that no subsequent events require disclosure in these financial statements.

SECTION 02

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE 1

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

Total Pension Liability	2022	2021	2020	2019	2018	2017	2016	2015	2014
Service cost	$ 54,129	55,596	57,743	55,532	52,579	80,002	76,407	68,145	72,333
Interest	354,304	362,472	349,760	343,416	332,357	389,938	369,708	353,405	334,818
Changes of benefit terms	-	-	-	-	-	(645,971)	-	-	-
Differences between expected and actual experience	(140,156)	(94,948)	78,724	34,668	62,117	(65,194)	(63,047)	(28,536)	-
Changes of assumptions	-	(155,659)	-	(47,463)	(16,572)	534,646	2,918	2,801	3,264
Benefit payments	(270,599)	(286,414)	(330,323)	(272,398)	(289,108)	(249,394)	(211,673)	(196,362)	(187,118)
Net change in total pension liability	(2,322)	(118,953)	155,904	113,755	141,373	44,027	174,313	199,453	223,297
Total pension liability-beginning	**$ 4,965,760**	**5,084,713**	**4,928,809**	**4,815,054**	**4,673,681**	**4,629,654**	**4,455,341**	**4,255,888**	**4,032,591**
Total pension liability-ending (a)	**$ 4,963,438**	**4,965,760**	**5,084,713**	**4,928,809**	**4,815,054**	**4,673,681**	**4,629,654**	**4,455,341**	**4,255,888**
Fiduciary Net Position									
Contributions-employer	81,351	77,495	83,837	89,897	83,010	93,658	94,279	92,610	64,338
Contributions-employee	30,942	29,873	33,441	34,281	35,622	25,404	25,511	25,092	23,994
Net investment income	523	1,338,230	84,115	221,775	322,306	432,948	(47,437)	51,801	589,518
Benefit payments, including refunds of employee contributions	(270,599)	(286,414)	(330,323)	(272,398)	(289,108)	(249,394)	(211,673)	(196,362)	(187,118)
Administrative expense	(4,161)	(4,213)	(4,516)	(4,952)	(4,890)	(4,898)	(6,771)	(6,640)	(6,884)
Other (Professional services)	(1,083)	(1,140)	(1,314)	(1,265)	(1,676)	(2,298)	(1,890)	(1,676)	(1,459)
Net change in fiduciary net position	$ (163,027)	1,153,831	(134,760)	67,338	145,264	295,420	(147,981)	(35,175)	482,389
fiduciary net position-beginning	**$ 5,256,763**	**4,102,932**	**4,237,692**	**4,170,354**	**4,025,090**	**3,729,670**	**3,877,651**	**3,912,826**	**3,430,437**
fiduciary net position-ending (b)	**$ 5,093,736**	**5,256,763**	**4,102,932**	**4,237,692**	**4,170,354**	**4,025,090**	**3,729,670**	**3,877,651**	**3,912,826**
City's net pension liability-ending (a)-(b)	$ (130,298)	(291,003)	981,781	691,117	644,700	648,591	899,984	577,690	343,062
Fiduciary net position as a percentage of the total pension liability	102.63%	105.86%	80.69%	85.98%	86.61%	86,12%	80.56%	87.03%	91.94%
Covered payroll	$ 255,100	243,045	259,235	272,498	260,345	289,947	280,436	277,745	268,424
Net pension liability as a percentage of Covered payroll	(51.08%)	(119.73%)	378.72%	253.62%	247.63%	223.69%	320.92%	207.99%	127.81%

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

SCHEDULE 2

SCHEDULE OF EMPLOYER CONTRIBUTIONS ($000) (UNAUDITED)

Year Ended June 30	Covered Payroll	Actuarially Determined Contribution	Contributions Related to the Actuarially Determined Contribution	Contribution Deficiency (Excess)	Contribution as a Percentage of Covered Payroll
2022*	$ 255,100	$ 78,571	$ 81,352	$ (2,781)	31.89%
2021*	243,045	88,104	77,495	10,609	31.89%
2020*	259,235	96,332	83,837	12,495	32.34%
2019*	272,498	99,676	89,897	9,779	32.99%
2018*	260,301	96,530	83,010	13,520	31.89%
2017*	289,947	88,745	93,658	(4,913)	32.30%
2016	280,436	87,464	94,279	(6,815)	33.62%
2015**	-	-	-	-	-
2014	268,424	83,480	64,338	19,142	23.97%

**Effective July 1, 2017, the Fund's statute requires the Fund and the City of Houston to independently conduct annual Risk Sharing Valuation Studies (RSVS). The RSVS is now a component used to determine the City of Houston's Actuarially Determined Contribution rate to the Fund. In accordance with SB 2190, the City's fiscal year contributions are based on the mid-point between the Fund's actuary's and the City's actuary's July 1, 2016 Initial Risk Sharing Valuation contribution rates.*

*** A funding valuation was not performed as of July 1, 2014; therefore, no actuarially determined contribution was calculated for the period July 1, 2014 to June 30, 2015*

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

SCHEDULE 3

SCHEDULE OF INVESTMENT RETURNS (UNAUDITED)

Year Ended June 30	Annual Money-Weighted Rate Of Return, Net Of Investment Expense[1]
2022	0.11%
2021	33.40%
2020	2.10%
2019	5.48%
2018	8.27%
2017	11.87%
2016	(1.29%)
2015	1.28%
2014	17.53%

[1] The money-weighted rate of return is the internal rate of return (IRR) on the Fund's investments, net of the Fund's investment expense, adjusted for the changing amounts actually invested. Accordingly, this calculation takes into account the effects of transactions that increase the amount of the Fund's investments (such as investment returns and contributions from employers and Fund members) and those that decrease the amount of pension Fund investments (such as benefit payments and Fund/investment expenses).

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

Notes to Schedule of Changes in the Fund's Net Pension Liability and Related Ratios:

A. **Benefit changes:**
- None

B. **Changes in Assumptions:**
- None

Notes to Schedule of Fund Contributions:

The Contributions related to the actuarially determined contribution is in accordance with Senate Bill 2190 (SB2190), which was adopted May 31, 2017. Effective July 1, 2017, SB2190 requires the Fund actuary and City actuary to separately prepare a draft of a Risk Sharing Valuation Study (RSVS).

The initial RSVS is dated as of July 1, 2016 and each RSVS use the following assumptions:

- Use of an investment return assumption of not more than 7.00%;
- Ultimate Entry Age Method with liabilities allocated from date of entry to expected payment of benefit. Under this method, future normal cost for active employees is calculated based on the Fund provisions in effect for the most recently hired employees;
- An asset valuation method that recognizes gains and losses on the market value of assets (based on the difference between the actual rate of return and the assumed rate of return) over five years. Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2016. New gains and losses will be recognized over five years beginning July 1, 2017;
- The use of a 30-year, closed, level percent of payroll amortization period, in which new gain/loss amortization bases are established each year. The Unfunded Actuarial Accrued Liability at July 1, 2016 is amortized as a level percentage of payroll over a closed amortization period of 30 years with payments effective for fiscal year beginning July 1, 2017. Additional actuarial experience losses will be amortized over a closed amortization period of 30 years in future valuations. If in any given year the Fund experiences an actuarial gain, any such gain will be used to offset the largest outstanding loss amortization base, if applicable;
- Payroll growth rate assumption of 2.75%, not to exceed 3% in future RSVS.

Upon completion of an annual RSVS, each actuary shall review and compare its counterpart's draft RSVS. If the difference between the two resulting City contribution rates is at or below 2%, the Fund actuary's RSVS will be used to determine the contribution rate for the fiscal year. If the difference is greater than 2%, the actuaries will have 20 business days to reconcile the contribution rates until the difference falls within 2%. If, however, the contribution rates cannot be reconciled, the arithmetic average will be used.

ACTUARIAL ASSUMPTIONS

The Fund, by statute, may adopt an actuarial valuation once every three years. The Texas Review Board has determined that the annual RSVS satisfies the statutory requirement. The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation **adopted** for financial statement reporting purposes are as follow:

Valuation date	July 1, 2016	
Actuarial cost method	Entry age method	
Amortization method	Level percentage of payroll over a closed amortization period 30 years effective July 1, 2015	
Remaining amortization period	24 years	
Asset valuation method	Gains and losses in the fair value of assets, based on the difference between the actual rate of return and the assumed rate of return, are recognized in the actuarial value over five years. Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2013. New gains and losses will be recognized over five years beginning July 1, 2014.	
Investment rate of return	7.25% per year, net of expenses Investment Returns prior to July 1, 2016 are assumed to be 8.5%. Expected future investment returns are assumed to be net of administrative and investment expenses	
Payroll growth rate	3% per year	
Salary increases	3% to 7%, based on seniority and merit	
General inflation rate	3% per year	
Cost of living adjustment	3% annually	
Mortality rates	**Active participants and non-disabled pensioners:** RP-2000 Table projected to year 2016 using Scale AA. Note: the RP-2000 Mortality Table projected to year 2026 using Scale AA is used to determine the mortality assumptions for the Fund, including the probability of ceasing active service due to death. **Disabled Pensioners:** Graduated rates **Disability Rates:** Graduated rates	
Future DROP interest credits	Floor of 5% and a ceiling of 10%. Interest is assumed to be credited at 8% to reflect an expected average 0.5% net gain due to asset performance outside this range.	
DROP Duration	Duration of DROP at Retirement	Percentage of participants electing retirement at the specified duration
	0	0%
	3	0%
	5	5%
	8	30%
	10	65%

The following changes in assumptions and methods have taken place since the July 1, 2015 valuation:

- In general, the mortality rates applicable to active and non-disabled participants are based on the RP-2000 table projected 10 years from the valuation date. Therefore, the mortality rates have been updated from the RP-2000 table projected to 2025 using scale AA to the RP-2000 table projected to 2026 using Scale AA. This increased the actuarial accrued liability by approximately $4 million.
- The assumed investment rate of return was changed from 8.5% to 7.25%. This change increased the actuarial accrued liability by approximately $504,000,000.

SECTION 02

ADDITIONAL SUPPLEMENTARY INFORMATION

SCHEDULE 4

INVESTMENT SERVICES, PROFESSIONAL SERVICES AND ADMINISTRATIVE EXPENSES
YEARS ENDED JUNE 30, 2022 AND JUNE 30, 2021

	2022	2021
Investment Services:		
Custodial services	$ 240,450	$ 233,113
Money management services	4,483,256	4,995,340
Actuarial Services	0	93,000
Consulting	3,055	855,310
Legal	374,372	181,312
Investment research	98,689	85,871
Department operating expenses	2,941,021	1,661,623
Total investment services	**$ 8,140,843**	**$ 8,105,569**
Professional services:		
Actuarial services	$ 147,872	$ 158,715
Audit and accounting services	29,250	36,900
Consulting and professional services	178,351	117,144
Government relations	630,041	630,000
Legal services	60,836	187,540
Medical examinations	35,970	9,735
Total professional services	**$ 1,082,320**	**$ 1,140,034**
Administrative expenses:		
Depreciation	$ 390,579	$ 378,161
Continuing education	64,713	27,551
Furniture, equipment and supplies	124,077	118,446
Insurance	561,044	670,188
Office cost	2,757,337	2,830,975
Facility maintenance	154,273	100,944
Utilities	108,861	86,877
Total administrative expenses	**$ 4,160,884**	**$ 4,213,142**

See accompanying independent auditors' report.

SUMMARY OF INVESTMENT AND PROFESSIONAL SERVICES
YEAR ENDED JUNE 30, 2022

Individual Or Firm Name	Amount	Nature Of Services
The Bank of New York Mellon Corporation	$ 240,450	Custodial
BlackRock Institutional Trust Company, N.A.	52,328	Money management
Newton Investment Management North America, LLC	2,818,393	Money management
Mellon Investments Corporation	270,886	Money management
Loomis, Sayles & Company L.P.	191,093	Money management
Shenkman Capital Management, Inc.	330,215	Money management
State Street Global Advisors Trust Company	449,464	Money management
Schroder Investment Management North America, Inc.	351,609	Money management
Blackstone Management Partners L.L.C.	19,268	Money management
Great West Financial	3,055	Consulting
DLA Piper LLP	374,372	Legal
Bloomberg Index Services Limited	4,125	Investment Research
Diligence Vault Corp	1,849	Investment Research
Frank Russell Company	900	Investment Research
Hedge Fund Research	6,043	Investment Research
Informa Investment Solutions, Inc.	26,114	Investment Research
Institutional Limited Partners Association	6,563	Investment Research
MSCI Inc.	688	Investment Research
S&P Global Market Intelligence LLC	6,598	Investment Research
The Burgiss Group, LLC	45,809	Investment Research
Other	2,941,021	Department Operating Expenses
Total Investment Services	$ 8,140,843	

See accompanying independent auditors' report.

SUMMARY OF INVESTMENT AND PROFESSIONAL SERVICES
YEAR ENDED JUNE 30, 2022

Individual Or Firm Name	Amount	Nature Of Services
Buck Global, LLC	$ 147,872	Actuarial Services
McConnell & Jones LLP	29,250	Audit
BEMA Information	2,400	Consulting
EFL Associates	66,039	Consulting
Encore Support System	140	Consulting
Fund Advisory and Consultant	2,971	Consulting
g3 Public Relations	48,730	Consulting
Great West Financial	11,080	Consulting
Levi, Ray & Shoup, Inc	16,721	Consulting
Payscale	4,320	Consulting
Ralph Marsh	20,795	Consulting
Bayside Printing Company, Inc.	1,155	Consulting, printing, and design
Limb Design Inc	4,000	Consulting, printing, and design
Cornerstone Governement Affairs, Inc	240,041	Government Relations
Delisi Communications, Inc.	126,000	Government Relations
One World Strategy Group, LLC	120,000	Government Relations
William & Jensen, PLLC	144,000	Government Relations
Clark Hill Strasburger	8,922	Legal
Hinshaw & Culbertson	27,702	Legal
Lehman Johnson Law, PLLC	2,200	Legal
Shipley Snell Montgomery LLP	22,012	Legal
Exam Coordinators Network	34,470	Medical Examinations
Southwest Orthopedic	1,500	Medical Examinations
Total Professional Services	**$ 1,082,320**	

See accompanying independent auditors' report.

SECTION 03

INVESTMENT INFORMATION

REPORT OF THE CHIEF INVESTMENT OFFICER & OUTLINE OF INVESTMENT POLICIES

Ajit Singh, FRM, CAIA

REPORT OF CHIEF INVESTMENT OFFICER

The primary goal of the Houston Firefighters' Relief and Retirement Fund's (Fund) investment program is to grow the assets of the Fund while maintaining the ability to pay the benefits promised to retirees and beneficiaries. This shall be achieved by earning an average annual return of 7.25% over a 10-year period.

The internal objective of the Fund's investment program is to generate an aggregate return in excess of the Fund's Policy Benchmark over a five-year period. The secondary objective is to continually improve the administration, oversight, and Trustee education of the Fund's investment program.

PORTFOLIO RESULTS[1]

The Houston Firefighters' Relief and Retirement Fund's investment portfolio concluded the fiscal year ending June 30, 2022, with a total portfolio investment return of 0.1% gross, exceeding the policy benchmark return of -4.0% by 4.1%. Public equities ended the year with -18.4%, fixed income with -9.0%, hedge funds with -8.6%, private equity with 25.3%, private debt with 11.8%, and real estate with 24.0%. The Fund maintained a slight underweight position in public equities and hedge funds, and an underweight position in fixed income. The investment strategy focused on maximizing returns within the risk budget and maintained a higher risk profile relative to the benchmark. This, with the sudden rise in volatility due to global macro events, such as continued lockdowns in China, the Russia-Ukraine war, continued supply chain issues, and rising interest rates, affected overall returns. The Fund's five-year (9.4%) return and ten-year (8.7%) return exceeded the policy benchmark (6.9% and 7.1%, respectively), reflecting long-term sustainable outperformance.

The Fund, managed by an internal staff of investment professionals, is well-diversified among a variety of asset classes, including global stocks and bonds, absolute return strategies, private equity, private debt, real estate, digital assets, and cash. The investment team seeks to meet its investment goals through prudent asset allocation policy, risk management, and disciplined manager selection. Even as uncertainties remain with a slowdown in global growth, the current asset allocation has a high probability of achieving long term return targets.

During June 2022, the Fund completed a secondary sale of Fund interests in multiple private market partnerships for $190 million. Proceeds totaling $76 million were received on June 30, 2022. A portion of the sale proceeds are structured as a deferred payment and held as receivables totaling $114 million to be received on June 30, 2023. The sale proceeds received in June 2022 contributed to the FY 2022 return

	7-YEAR	10-YEAR
HFRRF Total Fund[1]	8.2	8.7
Standard & Poor's 500 Index	11.1	13.0
Barclays Universal Index	1.6	1.8
Public Pension Fund Peers – Median[2]	6.8	8.1

[1] This information is gross of Fund expenses and investment fees (with the exception of commingled funds and partnerships whose fair value is reported as net asset values) and as such inclusive of management fees and expenses.

OUTLINE OF INVESTMENT POLICIES

The purpose of this Investment Policy Statement (IPS) is to assist the Board of Trustees (Board)/Investment Committee (IC) of the Fund in the investment and management of the Fund's assets. The IPS sets forth those factors governing or guiding the investment policy of the Fund. The IPS shall assist the Board to increase the corpus of the Fund's assets while maintaining the ability to pay those benefits determined by statute to the Fund retirees and beneficiaries. The Board manages the investment policy of the Fund in compliance with all applicable federal and state statutes and regulations concerning the investment of pension assets. Accordingly, the IPS shall be construed in a manner to be consistent with applicable laws and regulations. The authority to amend these policies and procedures rests solely with the Board. The IC is a committee of the whole Board and has the authority to act on all matters related to investments.

INVESTMENT PHILOSOPHY

In developing the investment policy, the IC is guided by a set of precepts from which all investment decisions are made, and which establish the foundation and direction for all investment activity. These precepts are applied by the IC, recognizing the importance of asset allocation and the benefits of diversification. The guiding precepts are as follows: Long-term Focus, Active Management, Strategic Asset Allocation, Tactical Asset Allocation, Liquidity, and Diversification.

ASSET ALLOCATION AND REBALANCING

The IC is responsible for setting the Fund's asset allocation targets, ranges, benchmarks, and objectives. The IC allocates the assets of the Fund to several asset classes with the objective of optimizing the investment return of the Fund within the framework of acceptable risk and diversification.

The IC will undertake a comprehensive review of the Fund's asset allocation targets and ranges through a periodic Asset Liability Management (ALM) Study. Such study shall recommend benchmarks for the Fund and shall help place the development of investment policy into the context of future benefit payments, liabilities, required funding, and the prospective funded status of liabilities. The primary objective of the ALM Study is to determine the asset class mix for the Policy Benchmark consistent with the Risk Appetite of the Fund's IP. In addition, the ALM Study proposes benchmarks for various asset classes which collectively have the best probability of meeting the expected returns. The Fund undertook an Asset-Liability and Investment Strategy Project in the first quarter of the fiscal year ending on June 30, 2022.

ASSET CLASS	RANGE	TARGET	BENCHMARK
Public Markets			
Cash & Short Term Cash Equivalent	0.5% - 8%	2%	**BofA ML 9-12 Mo. US Treasury Index***
Public Equities - Domestic	7% - 31%	19%	**Russell 3000 Index**
Public Equities - International	7% - 31%	19%	**MSCI All Country World Ex-US Index**
Aggregate Bonds	5% - 13%	9%	**Barclays US Aggregate Index****
Intermediate Credit	0% - 7%	3%	**Barclays US Aggregate Index****
Intermediate High Yield	1% - 15%	8%	**CS LLI 50%/ICE BofAML HY 50%****
Hedge Funds	0% - 12%	4.5%	**70% HFR Risk Parity V10 Inst Idx/30% Cash + CPI*****
Digital Assets	0% - 5%	0.5%	**Cash + CPI**
Private Markets			
Private Debt	0% - 10%	3%	**CS LLI 50%/ICE BofAML HY 50%**
Private Equity	10% - 37%	25%	**Cambridge Associates US Private Equity 1QA**
Real Estate	5% - 15%	7%	**NCREIF Property******

**Cash benchmark: Citigroup 3-month T-bill (4/30/1988 - 8/31/1997); ML 90-day T-bill Index (9/1/1997 - 5/31/2000); ML 1-Yr T-bill Index (6/1/2000 - 11/30/2009); 50% Barclays Capital 3-mo Tr Bill / 50% Barclays Capital 1-3 Yr Tr (12/1/2009 - 6/30/2013); BofA Merrill Lynch 9-12 Month US Treasury Index (7/1/2013 - Present).*
***Fixed Income benchmark: Bloomberg Barclays US Universal Index (1/1/1990 - 6/30/2016); Bloomberg Barclays US Aggregate Bond Index (7/1/2016 - 10/31/2021). Effective 11/1/2021, the Fixed Income asset class was separated into Aggregate Bonds, Intermediate Credit, and Intermediate High Yield with benchmarks as shown in the above chart.*
****Hedge Funds benchmark: LIBOR + 3% (6/1/2004 - 10/31/2021); 70% HFR RiskParityV10Inst Idx/30% Cash + CPI (November 1, 2021 - Present).*
*****NCREIF Timber/Property: National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index / Property Index with a 70/30 split (Inception to 6/30/2008); 50/50 split (7/1/2008 to 10/31/2021); NCREIF Property (11/1/2021 to Present).*

REBALANCING

Each asset class is allowed to operate within its specific range established by the IC. Market movements may make asset class weights fall outside of their ranges. An asset class is considered outside its range for the purpose of rebalancing when the average weight of the asset class during the calendar month falls outside its range. The CIO may rebalance public asset classes within Tactical Asset Allocation (TAA) ranges and disclose the rebalancing activities to the IC in the next monthly meeting.

If there is expected to be a near-term large cash outflow, the CIO may replenish cash accounts from public market asset classes, taking into consideration liquidity, trading cost, and TAA ranges. The CIO shall disclose the rebalancing activities to the IC in the next monthly meeting.

RISK MANAGEMENT

The risk objective is to follow the approved Risk Appetite and the Risk Tolerance for investments.

The Risk Appetite is implicit in the choice of the Strategic Asset Allocation (SAA). It is a rolling three-year standard deviation from the monthly returns of the SAA.

The Risk Tolerance measures the acceptable variation in outcomes the Fund seeks to achieve. The Risk Tolerance of the Fund is targeted as 400 basis points, measured as Tracking Error of the standard deviation of excess returns from the total NAV of Fund assets relative to the Policy Benchmark using monthly time series returns over a three-year rolling period.

MANAGER SELECTION

To assist the IC in the investment management of the Fund's assets, professional Investment Managers may be retained to implement certain strategies selected by the IC with guidance from the investment staff.

The appropriateness of seeking a new or replacement Investment Manager will be determined by the Fund's most current investment strategy, philosophy, asset class ranges, capital availability or the advisability of replacing an existing Investment Manager in accordance with the retention guidelines of this IPS.

The investment staff, for the recommendation to the IC, shall use a disciplined due diligence process to screen and select Investment Managers consistent with the asset class placement under consideration. No Investment Manager shall be given consideration by the IC until/unless the Investment Manager has undergone such due diligence process.

Any new mandate awarded to the existing Investment Managers or a recommendation to modify an existing mandate needs to go through the full due diligence process.

All relevant due diligence documentation for Investment Manager selection, review, retention, and termination purposes, should be retained as per the Fund's documentation retention policy.

A recommendation for a new mandate centered around terms specific to the recommended fund shall be presented by the investment staff for approval by the IC. As deemed appropriate by the IC, some outstanding matters may be delegated for successful resolution by consensus of the Investments Department and Legal Department (or assigned counsel, if applicable), with subsequent reporting of conclusion by the CIO to the IC. The mandate is initiated only after all appropriate negotiations, documentation, and other legal matters are successfully resolved.

Investment staff shall confer with Fund Investment Managers on a regular basis for the purposes of ongoing due diligence and monitoring.

Any Investment Manager may be required to make a presentation to the IC, as deemed appropriate by the CIO or the IC.

PERFORMANCE SUMMARIES

The reported investment performance of the Fund will be calculated by the Fund's custodian bank, an unaffiliated organization, with recognized expertise in this field and fiduciary level reporting responsibility to the Fund's IC. A calculation will be made for the Fund's aggregate, asset class, and Investment Manager performance consistent with the Global Investment Performance Standards (GIPS®) or a similar standard. Additionally, each Investment Manager is required to keep performance records and report periodically to the Fund's custodian, internal investment staff, and third-party auditor. The Fund's custodian bank will typically perform a calculation for any Investment Manager that has its Fund assets under management custodied by the Fund's custodian bank. If the custodian does not have custody of underlying assets of an investment, the custodian will rely on the NAV as duly reported to calculate aggregate Fund level performance.

A time-weighted rate of return calculation shall be used for all Market-Based Strategies and hedge funds. An internal rate of return shall be calculated for Private Investments.

The market value of the Fund shall be maintained on an accrual basis in compliance with applicable Government Accounting Standards Board statements and applicable laws and regulations.

FAIR VALUE AND CURRENT ASSET ALLOCATION (Dollars In Millions)

	June 30, 2022 Fair Value [1]	Percent	June 30, 2021 Fair Value [1]	Percent
Cash Equivalents	$ 504	10%	$ 154	3%
Aggregate Bonds	71	1%	840	16%
Intermediate High Yield	313	6%		
Domestic Equity	882	17%	1,101	21%
International Equity	755	15%	959	18%
Hedge Funds	224	4%	254	5%
Digital Assets	7	0%		
Private Debt	191	4%		
Private Equity	1,798	35%	1,674	32%
Real Estate	341	7%	266	5%
	$ 5,086	100%	$ 5,248	100%

[1] The fair value shown in this report includes accrued interest/dividends and payables/receivables on pending trades. Values shown above will differ from total assets shown in the Statements of Fiduciary Net Position for the HFRRF Total Portfolio by the amount of land, building, furniture, fixtures, and equipment as well as non-investments related payables/receivables.

INVESTMENT RESULTS

(GROSS, AS OF 6-30-2022)

TOTAL FUND RETURN VS. POLICY BENCHMARK	FY 2022	FY 2021	FY 2020	FY 2019	FY 2018	3-YEAR	5-YEAR	7-YEAR	10-YEAR
HFRRF - Total Portfolio	0.1	33.7	2.1	5.7	8.3	11.0	9.4	8.2	8.7
Policy Benchmark	(4.0)	22.6	2.8	8.2	6.6	6.6	6.9	6.6	7.1

RETURNS BY ASSET CLASS	FY 2022	FY 2021	FY 2020	FY 2019	FY 2018	3-YEAR	5-YEAR	7-YEAR	10-YEAR
HFRRF - Cash	(5.0)	0.3	3.1	3.7	2.1	(0.6)	0.8	1.4	2.0
BofA ML 9-12 Mo. US Treasury Index*	(1.7)	0.1	2.9	3.2	0.7	0.4	1.0	0.9	0.7
HFRRF - Domestic Equity	(15.1)	41.3	7.7	9.4	13.9	8.9	10.0	9.2	11.6
Russell 3000 Index	(13.9)	44.2	6.5	9.0	14.8	9.8	10.6	10.4	12.6
HFRRF - Fixed Income	(9.0)	8.6	6.2	6.5	0.2	1.6	2.3	3.3	3.8
Bloomberg Barclays US Aggregate Bond Index**	(10.3)	(0.3)	8.7	7.9	(0.4)	(0.9)	0.9	1.4	1.7
HFRRF - International Equity	(21.7)	34.6	(4.2)	0.0	7.5	0.3	1.7	1.6	4.4
MSCI All Country World Ex-US Index	(19.4)	35.7	(4.8)	1.3	7.3	1.4	2.5	2.9	4.8
HFRRF - Hedge Funds	(8.6)	14.7	(4.2)	4.6	8.0	0.2	2.6	1.8	2.9
70% HFR RiskParityV10Inst Idx/30% Cash + CPI Benchmark***	(8.6)	3.2	4.7	5.5	4.7	(0.4)	1.8	2.3	2.6
HFRRF - Digital Assets	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cash + CPI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HFRRF - Private Debt	11.8	22.0	2.1	(10.8)	N/A	11.7	N/A	N/A	N/A
S&P LSTA 50%/ICE BofAML HY 50%	(7.7)	13.6	(1.5)	5.8	N/A	1.1	N/A	N/A	N/A
HFRRF - Private Equity	25.3	65.4	2.2	11.8	14.0	28.4	22.0	17.9	17.4
CA US Private Equity 1QA	27.6	50.8	(3.2)	12.7	17.1	23.1	19.7	16.9	16.2
HFRRF - Real Estate	24.0	12.8	2.6	4.7	7.1	12.8	10.0	8.8	9.7
NCREIF Property****	19.5	5.2	1.5	4.8	5.4	8.5	7.1	6.8	8.0

**Cash benchmark: Citigroup 3-month T-bill (4/30/1988 - 8/31/1997); ML 90-day T-bill Index (9/1/1997 - 5/31/2000); ML 1-Yr T-bill Index (6/1/2000 - 11/30/2009); 50% Barclays Capital 3-mo Tr Bill / 50% Barclays Capital 1-3 Yr Tr (12/1/2009 - 7/01/2013); BofA Merrill Lynch 9-12 Month US Treasury Index (7/1/2013 - Present).*

***Fixed Income benchmark: Bloomberg Barclays US Universal Index (1/1/1990 - 6/30/2016); Bloomberg Barclays US Aggregate Bond Index (7/1/2016 - Present).*

****Hedge Funds benchmark: LIBOR + 3% (6/1/2004 - 10/31/2021); 70% HFR RiskParityV10Inst Idx/30% Cash + CPI (November 1, 2021 - Present).*

*****NCREIF Timber/Property: National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index / Property Index with a 70/30 split (Inception to 6/30/2008); 50/50 split (7/1/2008 to 10/31/2021); NCREIF Property (11/1/2021 - Present).*

COMPARISON OF INVESTMENT RETURNS

(GROSS, AS OF 6.30.2022)

TOTAL FUND RETURN VS POLICY BENCHMARK											
Year	Total Fund	Median Total Fund*	Fund Domestic Equity Inv	Russell 3000 Stock Ind	S&P 500	Fund Fixed Income Inv	Bloomberg Universal	Bloomberg Gov/Credit	Fund Intl Equity	MSCI World Ex US (Net Div)	MSCI EAFE (Net Div)
2013	11.5	12.4	26.8	21.5	20.6	3.5	0.2	(0.6)	16.6	14.1	18.6
2014	17.8	16.9	27.0	25.2	24.6	11.9	5.2	4.3	22.9	22.3	23.6
2015	1.5	3.4	0.4	7.3	7.4	0.2	1.6	1.7	(3.9)	(4.9)	(4.2)
2016	(1.0)	1.1	(2.7)	2.1	4.0	6.5	5.8	6.7	(13.8)	(9.8)	(10.2)
2017	12.0	12.4	18.1	18.5	17.9	5.0	0.9	(0.4)	19.4	19.5	20.3
2018	8.3	8.6	13.9	14.8	14.4	0.2	(0.3)	(0.6)	7.5	7.0	6.8
2019	5.7	6.6	9.4	9.0	10.4	6.5	8.1	8.5	0.0	1.3	1.1
2020	2.1	3.2	7.7	6.5	7.5	6.2	7.9	10.0	(4.2)	(5.4)	(5.1)
2021	33.7	27.0	41.3	44.2	40.8	8.6	1.1	(0.4)	34.6	33.6	32.4
2022	0.1	(8.4)	(15.1)	(13.9)	(10.6)	(9.0)	(10.9)	(10.9)	(21.7)	(16.8)	(17.8)

Report note:
**Median total fund returns are provided by Wilshire Trust Universe Comparison Service (TUCS) as of June 30, 'Total Returns of Master Trusts - Public'.*

ANNUALIZED RETURNS

(GROSS, AS OF 6.30.2022)

	Total Fund	Median Total Fund*	Fund Domestic Equity Inv*	Russell 3000 Stock Index	S&P 500 Stock Index	Fund Fixed Income Inv	Bloomberg Universal	Bloomberg Gov/Credit
2-YEAR	15.7	8.1	9.6	11.4	12.2	(0.6)	(5.1)	(5.8)
3-YEAR	11.0	6.0	8.9	9.8	10.6	1.6	(0.9)	(0.8)
5-YEAR	9.4	6.7	10.0	10.6	11.3	2.3	0.9	1.1
7-YEAR	8.2	6.8	9.2	10.4	11.1	3.3	1.6	1.6
10-YEAR	8.7	8.1	11.6	12.6	13.0	3.8	1.8	1.7

Report note
**Median total fund returns are provided by Wilshire Trust Universe Comparison Service (TUCS) as of June 30, 'Total Returns of Master Trusts - Public'.*

TEN LARGEST EQUITY INVESTMENT HOLDINGS

(AS OF 6.30.2022) (INCLUDING COMMINGLED FUNDS)

DESCRIPTION	FAIR VALUE	PERCENT OF TOTAL FAIR VALUE
BlackRock Russell 3000 Fund	$ 445,557,400	9.08%
BNYM Newton DB NSL Dynamic Global Ex-U.S. Equity Fund	421,349,819	8.59%
BNYM Mellon DB SL ACWI Ex-U.S. Fund	314,899,701	6.42%
BNYM Newton NSL Dynamic U.S. Equity LC Fund	308,505,192	6.29%
iShares Gold Trust Micro	75,196,440	1.53%
MSCI Europe Index NL CTF	19,102,017	0.39%
BNYM Newton NSL Dynamic U.S. Equity SC Fund	18,491,407	0.38%
Russell 1000 Index NL CTF	17,181,189	0.35%
MSCI Emerging Markets Index NL CTF	11,178,979	0.23%
Russell 2000 Index NL CTF	11,170,582	0.23%

The complete list of portfolio holdings can be obtained through a submission of a public information request for HFRRF's comprehensive integrated itemization of the portfolio.

TEN LARGEST BOND INVESTMENT HOLDINGS

(AS OF 6.30.2022) (INCLUDING COMMINGLED FUNDS)

DESCRIPTION	FAIR VALUE	PERCENT OF TOTAL FAIR VALUE
KKR Global Credit Opportunities Fund	$ 299,479,447	6.10%
U.S. Aggregate Bond Index NL CTF	20,040,851	0.41%
SPDR Bloomberg High Yield Bond ETF	10,041,597	0.20%
SPDR Bloomberg Short Term High Yield Bond ETF	3,799,382	0.08%
Verscend Escrow Corp 144A 9.750% 08/15/2026 DD 08/27/18	3,632,288	0.07%
CCO Holdings LLC / CCO HO 144A 5.500% 05/01/2026 DD 04/21/16	3,097,213	0.06%
KAR Auction Services Inc 144A 5.125% 06/01/2025 DD 05/31/17	2,747,213	0.06%
Legacy LifePoint Health L 144A 6.750% 04/15/2025 DD 04/13/20	2,563,708	0.05%
Ardagh Packaging Finance 144A 5.250% 04/30/2025 DD 04/08/20	2,438,515	0.05%
AMC Networks Inc 4.750% 08/01/2025 DD 07/28/17	2,313,065	0.05%

FEES FOR INVESTMENT SERVICES

FISCAL YEAR 2022

ASSET CLASS	ASSETS UNDER MANAGEMENT	MANAGEMENT FEES PAID FROM TRUST	MANAGEMENT FEES NETTED FROM RETURNS	CARRIED INTEREST [2]	TOTAL DIRECT AND INDIRECT FEES	BASIS POINTS
Cash Equivalents Manager[1]	$ 124,441,551	$ 205,469	-	-	$ 205,469	0.17%
Domestic Equity Managers	787,705,713	1,223,804	-	-	1,223,804	0.16%
International Equity Managers	754,410,184	1,712,334	192,667	-	1,905,001	0.25%
Fixed Income Managers	550,406,632	872,917	1,184,995	260,477	2,318,389	0.42%
Hedge Fund Managers	206,163,491	-	941,286	341,101	1,282,387	0.62%
Digital Assets Managers	6,992,433	-	42,399	-	42,399	0.61%
Hedge Fund Managers	190,970,112	-	2,304,718	912,195	3,216,913	1.68%
Private Equity Managers	1,797,862,641	19,164	17,152,482	20,652,598	37,824,243	2.10%
Real Estate Managers	341,345,504	-	5,426,450	8,995,164	14,421,615	4.22%
Global Tactical Asset Allocation Manager	147,284,836	440,942	72,020	-	512,962	0.35%

OTHER INVESTMENT SERVICES						
Custodian Bank	$ 4,907,583,097	$ 211,413	-	-	$ 211,413	0.00%
Total Fees For Investment Services	$ 4,907,583,097	$ 4,686,043	$ 27,317,017	$ 31,161,535	$ 63,164,595	1.29%

[1]Includes residual cash from separate accounts, which is swept daily and included in the Super STIF cash management portfolio.
[2]Carried Interest is realized/paid during the fiscal year.

BROKERAGE COMMISSIONS

FISCAL YEAR 2022

BROKER NAME	NUMBER OF SHARES	COMMISSIONS	CENTS/SHARE
BARCLAYS CAPITAL LE, NEW YORK	771	$6	0.75
BERNSTEIN SANFORD C & CO, NEW YORK	2,169	18	0.85
BNY CAPITAL MARKETS INC, NEW YORK	4,632,464	92,649	2.00
BROADCORT CAPITAL CORP FI, NEW YORK	84,227	590	0.70
BROADCORT CAPITAL CORP, NEW YORK	360,508	3,022	0.84
CITIGROUP GLOBAL MARKETS, INC., NEW YORK	2,732	20	0.75
CITIGROUP GLOBAL MARKETS, INC., NEW YORK	1,269,528	11,583	0.91
COWEN AND CO LLC, NEW YORK	547	4	0.75
CREDIT SUISSE, NEW YORK (CSUS)	40,722	285	0.70
FIDELITY CAPITAL MARKETS, NEW YORK	38,287	268	0.70
GOLDMAN SACHS & CO, NY	29,398	236	0.80
INSTINET CLEARING SER INC, NEW YORK	5,926	41	0.70
J.P. MORGAN SECURITIES INC, NEW YORK	189,350	1,332	0.70
J.P. MORGAN SECURITIES LLC, NEW YORK	391	4	0.99
JEFFERIES & CO INC, NEW YORK	5,864	44	0.75
LOOP CAPITAL MARKETS, JERSEY CITY	2,260	16	0.70
LUMINEX TRADING AND ANALYTICS, BOSTON	4	0	0.50
MERRILL LYNCH PIERCE FENNER SMITH INC NY	121,684	1,129	0.93
MERRILL LYNCH PROFESSIONAL CLRG, PURCHAS	138,274	968	0.70
MORGAN STANLEY AND CO., LLC, NEW YORK	137,267	964	0.70
PIPER JAFFRAY & CO., JERSEY CITY	25	1	2.00
RBC CAPITAL MARKETS LLC, NEW YORK	321	6	2.00
UBS SECURITIES LLC, STAMFORD	101,165	708	0.70
VIRTU AMERICAS LLC, NEW YORK	248,507	3,190	1.28
Total	**7,412,391**	**$ 117,084**	

SECTION 04

ACTUARIAL INFORMATION

September 28, 2022

Board of Trustees
Houston Firefighter's Relief and Retirement Fund
4225 Interwood North Parkway
Houston, TX 77032-3866

Re: Actuarial Certification

Dear Board Members:

As required under Senate Bill 2190, effective July 2017, Houston Firefighters' Relief and Retirement Fund (Fund) and the City of Houston (City) are independently required to conduct an annual Risk Sharing Valuation Study (RSVS) to determine the City of Houston contributions.

Pursuant to our engagement to provide actuarial services to the Fund, we prepared the RSVS for the Fund as of July 1, 2021[1]. We certify that the information contained in the Actuarial Report dated November 24, 2021, including the addendum dated June 8, 2022, has been prepared in accordance with the appropriate Actuarial Standards of Practice. To the best of our knowledge, the information fairly presents the actuarial position of the Fund as of July 1, 2021 for financial reporting purposes on the basis of the actuarial assumptions, methods and Fund provisions set forth herein.

The following tables and information contained in Section 4 (Actuarial Information) of the HFRRF Annual Comprehensive Financial Report (ACFR) were prepared by Buck:

- Risk Sharing Valuation Results, as revised by the Addendum
- Actuarial Investment Gain (Loss)
- Schedule of Actuarial Investment Gains (Losses)
- Actuarial Value of Assets
- Analysis of Change in Unfunded liability
- Development of Liability Layer for Plan Year Ending June 30, 2021
- Amortization Schedule as of July 1, 2021 ($000), as revised by the Addendum
- Appendix A: Summary of Actuarial Methods and Assumptions
- Appendix B: Summary of Plan Provisions
- Appendix C: Participant Information
- Appendix D: ASOP 51
- Addendum to the July 1, 2021 Proposed Risk Sharing Valuation Study

We certify that the information presented herein is accurate and fairly portrays the actuarial position of HFRRF as of July 1, 2021.

1. *The Risk Sharing Valuation Study has been provided without waiving the Fund's right to litigate the constitutionality of SB2190.*

The RSVS reflects the benefit provisions of the Fund as amended by, as well as funding policies mandated by, Senate Bill 2190.

In preparing the actuarial results, we have relied upon information provided by the Board of Trustees regarding plan participants, plan assets, contribution rates and other matters used in the actuarial valuation. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The results of the valuation are dependent on the accuracy of the data.

The prior actuaries prepared historical information for 2004 and prior fiscal years. We did not verify or provide an actuarial review of this historical information.

The Board of Trustees selected the actuarial methods and assumptions used in the valuation. In accordance with Senate Bill 2190, an experience study at least once every four years. the most recent having been made as of June 30, 2019. This RSVS was prepared on the basis of the demographic and economic assumptions that were recommended on the basis of the July 1, 2015 – June 30, 2019 Experience Review and approved by the Board of Trustees at its October 20, 2020, meeting, which includes a 7.00% per annum rate of investment return.

In our opinion, the actuarial assumptions used for funding purposes are reasonably related to the experience of the Fund and to reasonable long-term expectations. These assumptions were selected in accordance with applicable Actuarial Standards of Practice published by the Actuarial Standards Board.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets could result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the Fund if the Fund were to settle a portion or all of its liabilities.

The use of this report for any other purpose or by anyone other than the Board may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting it to perform an advance review of any statement, document, or filing based on information contained in this report. Buck will accept no liability for any such statement, document or filing made without prior review by Buck.

Future actuarial measurements may differ significantly from current measurements due to Fund experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of the RSVS.

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the liabilities derived and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked and reviewed by multiple experts within the company who are familiar with the details of the required changes.

This report was prepared under my supervision. I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. I meet the Academy’s Qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice and I am available to answer questions about it.

Buck Global, LLC

Michael A. Ribble, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

BUCK

200 Plaza Drive, 1st Floor
Secaucus, NJ 07094

November 24, 2021

Mr. Brett Besselman
Chairman of Board of Trustees
Houston Firefighters' Relief and Retirement Fund
4225 Interwood North Parkway
Houston, Texas 77032

Re: Proposed Risk Sharing Valuation Study

Dear Brett:

Pursuant to our engagement to provide actuarial services to the Houston Firefighters' Relief and Retirement Fund (Fund), we have prepared this Risk Sharing Valuation Study, as required under Senate Bill 2190[1], for the Fund as of July 1, 2021. This reflects the benefit provisions of the Fund as amended by, as well as funding policies mandated by, Senate Bill 2190 without regard to Section 13E.

The proposed Risk Sharing Valuation Study results in a funded ratio that exceeds 90% and a City contribution rate of 22.55%, which is less than the Initial Risk Valuation Study Corridor Minimum of 26.89%. In accordance with Section 13E of Senate Bill 2190, potential changes in the actuarial value of assets, assumed rate of return, benefit levels, or the acceleration of the amortization period to payoff liability loss layers may be required.

Risk Sharing Valuation Results[1]

($000)	2021 Risk Sharing Valuation Results	2020 Risk Sharing Valuation Results
Present Value of Future Benefits	$ 5,562,116	$ 5,626,313
Actuarial Accrued Liability	$ 4,881,608	$ 4,932,307
Actuarial Value of Assets	$ 4,550,468	$ 4,251,851
Unfunded Accrued Liability	$ 331,140	$ 680,456
Funded Ratio	93.2%	86.2%
City Normal Cost Rate[2]	14.98%	14.89%
City Accrued Liability Rate	7.57%	15.91%
Total City Contribution Rate[3]	22.55%	30.80%
Estimated City Contribution for following Fiscal Year	$ 58,381	$ 80,253
Employee Contribution Rate	10.50%	10.50%

[1] This Risk Sharing Valuation Study has been provided without waiving the Fund's right to litigate the constitutionality of SB2190.
[2] Contains an allowance for administration expenses equal to 1.25% of payroll.
[3] As a percentage of pensionable compensation.

Development of the Actuarial Value of Assets ($000)

Actuarial Investment Gain (Loss)

	Fiscal Year End June 30, 2021
Market Value of Assets at beginning of year	$ 4,102,932
Net Cash Flow	
Contributions	$ 107,368
Disbursements	291,767
Net Cash Flow	$ (184,399)
Expected Investment Return	$ 280,860
Expected Market Value of Assets at end of year	$ 4,199,393
Market Value of Assets at end of year	$ 5,256,763
Investment Gain / (Loss)	$ 1,057,370

Schedule of Actuarial Investment Gains (Losses)

Plan Year Ending	Initial Actuarial Gain (Loss)	Current Year Recognized Gain (Loss)	Unrecognized Gain (Loss) As of July 1, 2021
June 30, 2017	$ 176,604	$ 35,321	$ 0
June 30, 2018	46,641	9,328	9,328
June 30, 2019	(64,836)	(12,967)	(25,934)
June 30, 2020	(204,992)	(40,998)	(122,995)
June 30, 2021	1,057,370	211,474	845,896
			$ 706,295

Actuarial Value of Assets

Market Value as of July 1, 2021	$ 5,256,763
(Gain) / Loss to be Recognized in Future Years	(706,295)
Actuarial Value as of July 1, 2021	$ 4,550,468

Change in Key Results since the Prior Risk Sharing Valuation ($000)

Analysis of Change in Unfunded Liability		2020/2021
Unfunded at Beginning of Period	$	680,456
Estimated Change Due to Normal Operation		
Normal Cost	$	61,078
Contributions		(107,368)
Administrative Expenses		5,353
Interest		46,223
Net Change	$	5,286
Estimated Change due to Actuarial Experience		
Actuarial (gain) loss from asset sources	$	(191,731)
Actuarial (gain) loss from liability sources		(162,871)
Net change	$	(354,602)
Unfunded Actuarial Accrued Liability at End of Period	$	331,140

Development of Liability Layer for Plan Year Ending June 30, 2021

Source	Amount ($000)
Actuarial Value of Assets (Gain)/Loss	$ (191,731)
Actuarial Accrued Liability (Gain)/Loss	(162,871)
Impact of Assumption Changes	0
Contributions Different than Expected	11,869
Total	$ (342,733)

Amortization Schedule as of July 1, 2021 ($000)

Plan Year Ending	Initial Liability Layer	Liability Layer as of July 1, 2021	Remaining Amortization Payments as of July 1, 2021	Payment for Fiscal Year 2023	As a % of Fiscal Year 2023 Payroll[2]
June 30, 2016	$ 900,223	$ 1,000,584	25	$ 63,395	24.49%
June 30, 2017	(19,325)	(21,240)	25[1]	(1,346)	(0.52)%
June 30, 2018	(32,368)	(35,217)	25[1]	(2,231)	(0.86)%
June 30, 2019	(61,676)	(66,504)	25[1]	(4,214)	(1.63)%
June 30, 2020	(190,421)	(203,750)	25[1]	(12,909)	(4.99)%
June 30, 2021	(342,733)	(342,733)	25[1]	(23,088)	(8.92)%
Total		$ 331,140		$ 19,607	7.57%

[1] Per SB 2190, the amoritization for a new liability gain layer is equal of the remaining amortization period on the largest remaining liability loss year.
[2] Based on projected pensionable compensation of $258,896,000.

Actuarial Certification

We certify that the information contained in this Risk Sharing Valuation Study has been prepared in accordance with the appropriate Actuarial Standards of Practice. To the best of our knowledge, the information fairly presents the actuarial position of the Houston Firefighters' Relief & Retirement Fund as of July 1, 2021 on the basis of the actuarial assumptions, methods and Fund provisions set forth herein.

The Board of Trustees of the Fund may use this report for discussing and reaching consensus with the City of Houston on the City Contribution Rate. Use of this report for any other purpose or by anyone other than the Board or the City of Houston may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting an advance review of any statement, document, or filing to be based on information contained in this report. Buck will accept no liability for any such statement, document or filing made without prior review by Buck.

Future actuarial measurements may differ significantly from current measurements due to Fund experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in Fund provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this Risk Sharing Valuation Study.

Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets could result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the Fund if the Fund were to settle a portion or all of its liabilities.

In preparing the actuarial results, we have relied upon information provided by the Board of Trustees as of July 1, 2021 regarding Fund provisions, Fund participants, Fund assets, contribution rates and other matters used in the Risk Sharing Valuation Study. Specifically, a market value of assets equal to $5,256,762,808 has been provided by the Fund representatives. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The accuracy of the results of this Risk Sharing Valuation Study is dependent on the accuracy of the data.

Actuarial Standard of Practice No. 56 ("ASOP 56") provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to an internally developed model that applies applicable funding methods and policies to the liabilities derived and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. The review is performed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed. Significant changes to the internal model that are applicable to multiple clients are generally developed, checked and reviewed by multiple experts within the company who are familiar with the details of the required changes.

As required under Senate Bill 2190, experience studies are performed once in every four-year period. This Risk Sharing Valuation Study was prepared on the basis of the demographic and economic assumptions that were selected on the basis of the Fiscal Year Ending June 30, 2015 through Fiscal Year Ending June 30, 2019 Experience Review and adopted by the Board of Trustees at their October 20, 2020 meeting. This experience study is conducted to determine the assumptions that will serve as the basis for the Risk Sharing Valuation Studies from July 1, 2020 – July 1, 2023.

Except as prescribed in Senate Bill 2190 (as noted in Appendix A), the Board of Trustees has sole authority to determine the actuarial assumptions and has selected the actuarial methods and assumptions used in this Risk Sharing Valuation Study. In our opinion, those actuarial assumptions selected by the Board are reasonably related to the experience of the Fund and to reasonable long-term expectations. The actuarial assumptions prescribed by Senate Bill 2190 have been reflected in this Risk Sharing Valuation Study.

A summary of the actuarial assumptions, major Fund provisions, and Fund participant data used to calculate the results of this study can be found in the appendices.

Based on the statutory requirements of Senate Bill 2190 it is our understanding that the actual City contribution rate may be established as an average of the contribution rates shown in this report and those shown in the Risk Sharing Valuation Study prepared by the City's actuary. If future contributions are established in this manner at levels below those presented in this report, the Fund may not be expected to achieve a fully funded position over the 30-year time horizon as contemplated in the statute based on the data, assumptions and methods set forth in the attached.

Furthermore, this proposed Risk Sharing Valuation Study results in a funded ratio that exceeds 90% and a City contribution rate of 22.55%, which is less than the Initial Risk Valuation Study Corridor Minimum of 26.89%. In accordance with Section 13E of Senate Bill 2190, potential changes in the actuarial value of assets, assumed rate of return, benefit levels, or the acceleration of the amortization period to payoff liability loss layers may be required.

I am a Fellow of the Society of Actuaries and Member of the American Academy of Actuaries. I meet the Academy's Qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

If you have any questions concerning this information, please let me know.

Respectfully submitted,

Buck Global, LLC

Michael A. Ribble, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

BASIS FOR ASSUMPTIONS

The economic and demographic assumptions used in the study (except for the investment return assumption) were adopted by the Board in consultation with Buck. Senate Bill 2190 requires that an actuarial experience study be performed in order to review the experience of the Fund at least once every four years to determine if any changes to the Risk Sharing Valuation Study assumptions are warranted. In general, the assumptions used in the Risk Sharing Valuation Study are based on recommendations made and approved by the Board as part of an Experience Study covering Fiscal Year Ending June 30, 2015 through Fiscal Year Ending June 30, 2019. Senate Bill 2190 requires the use of an investment return assumption of not more than 7.00%.

ACTUARIAL METHODS

Actuarial Value of Assets

Senate Bill 2190 requires the use of an asset valuation method that recognizes gains and losses on the market value of assets (based on the difference between the actual rate of return and the assumed rate of return) over five years. Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2016. New gains and losses will be recognized over five years beginning July 1, 2017.

Actuarial Cost Method

Senate Bill 2190 requires the use of the Ultimate Entry Age Method with liabilities allocated from date of entry to expected payment of benefit. Under the Ultimate Entry Age Method, future normal cost for active employees is calculated based on the Fund provisions in effect for the most recently hired employees.

Senate Bill 2190 also requires the use of a 30-year, closed, level percent of payroll amortization period, in which new gain/loss amortization bases are established each year. The Unfunded Actuarial Accrued Liability at July 1, 2016 was amortized as a level percentage of payroll over a closed amortization period of 30 years with payments effective for fiscal year beginning July 1, 2017. Additional actuarial experience losses will be amortized over a closed amortization period of 30 years in future Risk Sharing Valuation Studies. If, in any given year, the Fund experiences an actuarial gain, any such gain will be used to offset the largest outstanding loss amortization base, if applicable.

KEY ECONOMIC ASSUMPTIONS

Investment Return

Real Rate of Return	4.50%
Price Inflation	2.50%
Total Nominal Rate	7.00%

Expected future investment returns are assumed to be net of investment expenses.

Wage Inflation

3.00%

Payroll Growth Rate

3.00%

Normal Cost Load for Administrative Expenses

1.25% of pensionable payroll[1]

[1] *required by Senate Bill 2190*

Individual Pay Increase Rate

	(NOMINAL = MERIT + WAGE INFLATION)	
Age	Nominal	Merit
20	7.00%	4.00%
25	6.25%	3.25%
30	5.50%	2.50%
35	5.00%	2.00%
40	4.00%	1.00%
45	3.70%	0.70%
50	3.40%	0.40%
55	3.00%	0.00%

KEY DEMOGRAPHIC ASSUMPTIONS

RETIREMENT RATES	
Number of Years of Service	Probability of Retiring Within One Year
Less than 25	2.0%[1]
25	2.0%
26	5.5%
27	5.5%
28	5.5%
29	5.5%
30	13.0%
31	15.0%
32	20.0%
33	20.0%
34	20.0%
35	30.0%
36	30.0%
37	40.0%
38	40.0%
39	40.0%
40+	100.0%

[1] *participants eligible to enter the DROP in the future are not assumed to retire with less than 25 years of service before age 55*

DROP DURATION	
Duration of DROP at Retirement	Percentage of Participants Electing Retirement at the Specified Duration
0	0%
3	0
5	10
8	20
10	45
13	25

SAMPLE RATES					
Number of Years of Service at Actual Retirement	Percentage of Participants Retiring with Specific DROP Duration				
	3 yrs	5 yrs	8 yrs	10 yrs	13 yrs
20-24	0.0%	0.0%	0.0%	0.0%	0.0%
25-27	0.0%	100.0%	0.0%	0.0%	0.0%
28-29	0.0%	33.3%	66.7%	0.0%	0.0%
30-32	0.0%	13.3%	26.7%	60.0%	0.0%
33-40	0.0%	10.0%	20.0%	45.0%	25.0%

DROP balances for active members are assumed to be paid out over 15 years upon exiting the DROP. DROP balances of members who have left active service are assumed to be paid out over 7.5 years. Future DROP payments are discounted based on the difference between the assumed investment rate of return and the assumed DROP interest crediting rate.

MORTALITY RATES

Service Retirees and Contingent Annuities

SOA Public Safety (Below-Median, base year 2010) amount weighted tables generationally projected with Mortality Improvement Scale MP-2019. The base table for males is adjusted by 97.2% to reflect credible plan experience

Survivor Beneficiaries

SOA Public Contingent Survivor (Below-Median, base year 2010) amount weighted tables generationally projected with Mortality Improvement Scale MP-2019. The base table for females is adjusted by 106.0% to reflect credible plan experience.

Disabled Retirees

SOA Public Safety Disabled Retiree (base year 2010) amount weighted tables generationally projected with Mortality Improvement Scale MP-2019.

All others, including active and vested terminated participants

SOA Public Safety (Below-Median, base year 2010) amount weighted tables generationally projected with Mortality Improvement Scale MP-2019.

DISABILITY RATES

Graduated rates

SAMPLE DISABILITY RATES PER 100 PARTICIPANTS	
Age	Disability
20	0.45
25	0.45
30	0.45
35	1.00
40	1.00
45	1.00
50	1.00
55	1.00
60	1.00

PERCENTAGE OF DEATH AND DISABILITIES IN LINE OF DUTY		
Age	Death	Disability[1]
25	80%	80%
35	80	80
45	40	80
55	20	80

[1]Percentage of disabilities in the line of duty is assumed to be a flat 80% for all ages. 50% of firefighters who become disabled in the line of duty are assumed to be incapable of performing any substantial gainful activity.

TERMINATION RATES

Age	Termination Rate
20	2.40%
25	2.40
30	2.40
35	1.50
40	0.75
45	0.75
50	0.00

For members hired prior to July 1, 2017 who are terminating with at least 10 years but less than 20 years of service:

- 80% will elect a contribution refund
- 20% will elect a deferred monthly pension benefit

MARITAL STATUS AT BENEFIT ELIGIBILITY

Percentage married

82% of male participants are assumed to be married, and 85% of female participants are assumed to be married. No beneficiaries other than the spouse assumed.

Age difference

Male participants are assumed to be two years older than wives, and female participants are assumed to be six years younger than their husbands.

DEVELOPMENT OF RISK SHARING VALUATION STUDY PAY

The Risk Sharing Valuation Study pay is developed by increasing the prior year's pay with the nominal individual pay increase rate. For participants reported with compensation less than $10,000, their compensation is set equal to their most recent annual compensation amount in excess of $10,000.

AGE AT WHICH BENEFITS END FOR CHILD BENEFICIARIES

Benefits are assumed to end once the child beneficiary reaches age 23.

FUTURE DROP RETURNS

Future DROP interest crediting rates are assumed to be equal to 65% of the assumed asset return (currently 65% of 7% equals 4.55%).

FUTURE COST-OF-LIVING ADJUSTMENTS

COLAs are assumed to be equal to the assumed asset return less 4.75% (currently 7% minus 4.75% equals 2.25%).

CENSUS DATES

All dates in the census used to calculate liabilities are set as July 1st in the year of the event.

MISSING DATA ASSUMPTIONS

Pay for New Hires
None were missing.

Employee Contributions
Based on the prior year's contributions.

Benefits Not Valued
The proportional retirement program between the Houston municipal, police and fire pension funds which allows for combining service credit from two or more City of Houston pension plans was not valued because its impact is expected not to be material.

SUMMARY OF CHANGES FROM THE JULY 1, 2020 RISK SHARING VALUATION STUDY

None.

MEMBERSHIP

Any firefighter who has not reached the age of 36 at the time he or she first enters employment shall automatically become a participant in the Fund upon completing the training period. Before October 1, 1990, the eligibility age was age 31. Before 1984, participants entered the Fund on January 1 or July 1.

AVERAGE SALARY

For members hired prior to July 1, 2017, the average of the highest 36 months of pensionable pay (or 78 pay periods). For members hired on or after July 1, 2017, the average of the final 36 months of pensionable pay (or 78 pay periods).

PENSIONABLE PAY

Pensionable pay prior to July 1, 2017 includes base pay and overtime, before reduction for pre-tax employee contributions and salary deferrals. Pensionable pay after July 1, 2017 includes base pay, before reduction for pre-tax employee contributions and salary deferrals.

STANDARD SERVICE PENSION - MEMBERS HIRED PRIOR TO JULY 1, 2017

Eligibility

20 years of service.

Benefit

- For retirement on or after November 1, 1997 and applicable for service accrued prior to July 1, 2017, 50% of average monthly salary; plus 3% of average monthly salary per year of service in excess of 20 years. For service accrued after July 1, 2017, 2.75% of average monthly salary per year of service for the member's first 20 years of service; plus 2.00% of average monthly salary per year of service in excess of 20 years.
- For retirement on or after November 1, 1996 and prior to November 1, 1997, 48.334% of average monthly salary, plus 2.834% of average monthly salary per year of service in excess of 20 years.
- For retirement on or after November 1, 1995 and prior to November 1, 1996, 46.667% of average monthly salary, plus 2.667% of average monthly salary per year of service in excess of 20 years.
- For retirement on or after September 1, 1991 and prior to November 1, 1995, 45% of average monthly salary, plus 2.5% of average monthly salary per year of service in excess of 20 years, up to 30 years, plus 1.0% of average monthly salary in excess of 30 years.
- For retirement on or after September 1, 1989 and prior to September 1, 1991, 45% of average monthly salary, plus 2.5% of average monthly salary per year of service in excess of 20 years.
- For retirement on or after September 1, 1987 and prior to September 1, 1989, 45% of average monthly salary, plus 2% of average monthly salary per year of service in excess of 20 years.
- For retirement on or after July 1, 1986 and prior to September 1, 1987, 40% of average monthly salary plus 2% of average monthly salary per year of service in excess of 20 years.
- For retirement on or after January 1, 1970 and prior to July 1, 1986, 35% of average monthly salary plus 3% of average monthly salary per year of service in excess of salary per year of service in excess of 25 years.

Maximum

- For retirement on or after July 1, 2017, none.
- For retirement on or after September 1, 1991, 80% of average monthly salary.
- For retirement on or after September 1, 1989 and prior to September 1, 1991, 70% of average monthly salary.
- For retirement on or after September 1, 1987 and prior to September 1, 1989, 65% of average monthly salary.
- For retirements on or after January 1, 1970 and prior to September 1, 1987, 60% of average monthly salary.

In addition, a member will receive a $5,000 lump sum payment upon retirement.

STANDARD SERVICE PENSION - MEMBERS HIRED ON OR AFTER JULY 1, 2017

Eligibility

Age at which the sum of the member's age and service equals 70.

Benefit

2.25% of average monthly salary per year of service for the member's first 20 years of service; plus 2.00% of average monthly salary per year of service in excess of 20 years.

Maximum

80% of average monthly salary.

In addition, a member will receive a $5,000 lump sum payment upon retirement.

ALTERNATE SERVICE PENSION

Eligibility

Firefighters who became participants prior to September 1, 1987 and who attain age 50 with 20 years of service will receive the greater of the standard or alternate pension.

Benefit

50% of average monthly salary plus 1% of average monthly salary per year of service after becoming eligible to retire on an alternate pension.

Maximum

65% of average monthly salary.

SUPPLEMENTAL BONUS CHECK

Supplemental payments totaling up to $5 million will be payable on a prorated basis determined by the Board of Trustees to all retirees and survivors.

DEFERRED RETIREMENT OPTION PLAN (DROP)

Eligibility

20 years of service. Members hired on or after July 1, 2017 are not eligible to enter DROP.

Benefit

Effective July 1, 2000, eligible participants may elect to participate in the DROP. The member's standard or alternate service pension (whichever is greater) 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 a participant of the DROP:

- The member's monthly retirement pension, including applicable cost-of-living adjustments (no cost-of living adjustments will be granted while a member is a participant in DROP after July 1, 2017),
- The member's contributions to the Retirement Fund contributed prior to July 1, 2017, and
- Investment earnings/losses at the rate of the Retirement Fund's earnings/losses averaged over a five-year period. Effective July 1, 2017, investment earnings will be contributed to a member's DROP account at the rate of 65% of the Retirement Fund's earnings/losses averaged over a five-year period.

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

Effective on July 1, 2000, a three-year back DROP is available for all eligible participants. The DROP account would be recalculated based on what the account balance would have been had the participant elected the DROP up to 3 years earlier than he/she actually did. The initial DROP entry date cannot be backdated prior to September 1, 1995, or prior to completion of 20 years of credited service, and must be on the first day of the month selected.

The monthly benefit at actual retirement will increase 2% for every year of DROP participation, not to exceed 10 years, for a participant who has at least 20 years of service as of July 1, 2017.

Members can remain in the DROP for 13 years. If a member remains in active service after 13 years in DROP, no further deposits other than unused leave pay will be made to the DROP account, but the DROP account will continue to accrue interest.

If a DROP participant suffers an on-duty disability resulting in the inability to perform any gainful activity or dies in the line of duty, the death or disability annuity benefit would be calculated as though the participant had not entered the DROP. In addition, the DROP account would be payable to the participant or beneficiary.

SERVICE-CONNECTED DISABILITY PENSION

Eligibility

No age or service requirements.

Benefit

50% of average monthly salary, or service pension if greater and eligible. Firefighters who are not capable of performing any substantial gainful activity will receive 75% of average monthly salary, or service pension, if greater and eligible.

In addition, a member will receive a $5,000 lump sum.

NON-SERVICE-CONNECTED DISABILITY PENSION

Eligibility

No age or service requirements.

Benefit

25% of average monthly salary, plus 2.5% of average monthly salary per year of service.

Maximum

50% of average monthly salary or service pension, if greater and eligible.

In addition, a member will receive a $5,000 lump sum..

VESTED PENSION

Eligibility

For members hired prior to July 1, 2017, at least 10 but less than 20 years of service.

Benefit

For members hired prior to July 1, 2017, 1.7% of average monthly salary per year of service payable beginning at age 50. For members hired on or after July 1, 2017, the benefit is equal to their accrued service pension benefit deferred to the age at which the sum of the member's age and service equals 70. Members receive a refund of contributions without interest in the event of termination before 10 years of service. Members who elect a refund of contributions after attaining 10 years of service receive interest only on contributions made prior to July 1, 2017.

DEATH BENEFITS

Payable as specified below if survived by a spouse, dependent children, or dependent parents. Effective November 1, 1997 dependent children can continue to receive benefits between the ages of 18 and 22 if they are in college.

Non-service-connected

Monthly benefit that would have been payable had the participant retired for non-service-connected disability on the date of his or her death (or service pension if greater).

Postretirement

Monthly benefit payable to the participant prior to his or her death. Effective July 1, 1998, a "graded" postretirement death benefit is payable to a surviving spouse if the retiree was not married at the time of retirement. This "graded" benefit is equal to 20% of the postretirement death benefit for each year of marriage to a maximum 100% after five years of marriage.

Preretirement

In the case of the death of an active firefighter in the line of duty, eligible survivor will receive a benefit equal to 100% of the decedent's average monthly salary. Refund of contributions made if no eligible survivors. If death occurs after 10 years of service, interest is credited on the contributions at the flat rate of 5% not compounded. If death occurs before 10 years of service, no interest is credited.

Lump sum

A one-time $5,000 lump sum death benefit for any active or retired firefighter. This benefit applies to active members, current retirees, and disabled participants.

ADDITIONAL BENEFIT

Effective on or after July 1, 2001, an extra monthly benefit of $150 is payable for life to any retired or disabled member or to an eligible survivor of a deceased member. This benefit is not subject to the postretirement adjustment.

EXCESS BENEFIT

Benefit equal to the excess of any members' standard service pension benefit over the limit imposed by Section 415 of the code.

POST-RETIREMENT ADJUSTMENT

Prior to October 1, 1990

Pensions adjusted each year based on changes in the CPI-U, but not below original amount or above original amount increased 3% each year, not compounded.

Pension adjustments for participants who retire after March 1, 1982 begin at age 55.

Pension adjustments begin immediately for participants whose benefits become payable on or after July 1, 1986 and are based upon 30 or more years of service.

On or after October 1, 1990 and prior to November 1, 1997

Pensions adjusted each year based on changes in the CPI-U. The adjustment is based on the amount of benefits payable at the time of adjustment. The maximum annual increase shall be 3% of the benefits payable at the time of adjustment.

Pension adjustments begin immediately for participants whose benefits become payable on or after July 1, 1986 and are based upon 30 or more years of service.

On or after November 1, 1997 and prior to October 1, 2017

Pensions adjusted each year at a fixed rate of 3%. The adjustment is based on the amount of benefits payable at the time of adjustment.

Pension adjustments for participants who retire or terminate with a vested benefit after March 1, 1982 begin at age 48. Pension adjustments begin immediately for participants who become disabled and cannot perform any substantial gainful activity (current and future) and qualify for general on-duty disability benefits. Participants whose benefits become payable on or after July 1, 1986 and are based upon 30 or more years of service are also eligible for pension adjustments to begin immediately.

On or after October 1, 2017 and prior to October 1, 2019

Pensions adjusted each year at a rate equal to the Fund's most recent five fiscal years' smoothed return minus 5% (but not less than 0% nor greater than 4%). The adjustment is based on the amount of benefits payable at the time of adjustment. Pension adjustments only paid to members who are at least 70 years old.

On or after October 1, 2019

Pensions adjusted each year at a rate equal to the Fund's most recent five fiscal years' smoothed return minus 4.75% (but not less than 0% nor greater than 4%). The adjustment is based on the amount of benefits payable at the time of adjustment. Pension adjustments only paid to members who are at least 70 years old in October 2019. Pension adjustments only paid to members who are at least 55 years old after October 2019.

CONTRIBUTION RATES

Members

10.5% of salary effective July 1, 2017. Members receive a refund of contributions without interest in the event of termination before 10 years of service. Members who elect a refund of contributions after attaining 10 years of service receive interest only on contributions made prior to July 1, 2017.

City

Effective for fiscal year ending 2018, city contribution rates will be made in accordance with the annual Risk Sharing Valuation Study. The city contribution rate in any fiscal year will not be greater than the city contribution rate projected in the initial Risk Sharing Valuation Study for that fiscal year plus 5%. The city contribution rate in any fiscal year will not be less than the city contribution rate projected in the initial Risk Sharing Valuation Study for that fiscal year minus 5%.

SUMMARY OF ACTIVE PARTICIPANTS
AS OF JULY 1, 2021

	YEARS OF SERVICE										
Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & UP	Total
UNDER 25 Avg. Pay	12 $ 48,820	25 $ 47,879	- -	- -	- -	- -	- -	- -	- -	- -	37 $ 48,184
25 TO 29 Avg. Pay	21 $ 49,461	121 $ 50,567	75 $ 60,696	- -	- -	- -	- -	- -	- -	- -	217 $ 53,960
30 TO 34 Avg. Pay	16 $ 49,237	148 $ 51,278	322 $ 61,217	48 $ 68,006	- -	- -	- -	- -	- -	- -	534 $ 58,714
35 TO 39 Avg. Pay	4 40,715	64 $ 52,059	234 $ 60,337	277 $ 68,125	75 $ 74,260	- -	- -	- -	- -	- -	654 $ 64,302
40 TO 44 Avg. Pay	- -	4 $ 55,716	67 $ 59,938	192 $ 67,651	423 $ 72,363	36 $ 77,903	- -	- -	- -	- -	722 $ 70,141
45 TO 49 Avg. Pay	- -	- -	3 $ 62,935	84 $ 65,819	338 $ 71,862	155 $ 77,735	1 $ 99,437	- -	- -	- -	581 $ 72,556
50 TO 54 Avg. Pay	- -	- -	- -	1 $ 58,972	147 $ 72,132	122 $ 75,847	1 $ 96,078	- -	- -	- -	271 $ 73,852
55 TO 59 Avg. Pay	- -	- -	- -	- -	5 $ 67,620	26 $ 70,941	- -	- -	1 $ 95,864	- -	32 $ 71,201
60 TO 64 Avg. Pay	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 TO 69 Avg. Pay	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & UP Avg. Pay	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
TOTAL AVG. PAY	**53** **$ 48,588**	**362** **$ 50,993**	**701** **$ 60,753**	**602** **$ 67,627**	**988** **$72,277**	**339** **$ 76,553**	**2** **$ 96,757**	**-** **-**	**1** **$ 95,864**	**-** **-**	**3,048** **$ 66,269**

Average Age: 39.84 — Average Service: 12.33

SUMMARY OF DROP PARTICIPANTS
AS OF JULY 1, 2021

	YEARS OF SERVICE										
Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & UP	Total
UNDER 25	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
25 TO 29	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
30 TO 34	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
35 TO 39	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
40 TO 44	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
45 TO 49	-	-	-	-	-	40	39	-	-	-	79
Avg. Pay	-	-	-	-	-	$ 79,169	$ 79,568	-	-	-	$ 79,366
50 TO 54	-	-	-	-	-	63	156	53	1	-	273
Avg. Pay	-	-	-	-	-	$ 78,242	$ 79,370	$ 81,823	$ 98,002	-	$ 79,654
55 TO 59	-	-	-	-	-	37	80	51	28	-	196
Avg. Pay	-	-	-	-	-	$ 77,767	$ 76,076	$ 79,724	$ 82,453	-	$ 78,255
60 TO 64	-	-	-	-	-	1	27	10	25	5	68
Avg. Pay	-	-	-	-	-	$ 69,010	$ 76,029	$ 74,366	$ 85,696	$ 91,052	$ 80,340
65 TO 69	-	-	-	-	-	-	-	3	1	2	6
Avg. Pay	-	-	-	-	-	-	-	$ 83,430	$ 71,070	$ 76,220	$ 78,967
70 & UP	-	-	-	-	-	-	-	-	-	1	1
Avg. Pay	-	-	-	-	-	-	-	-	-	$ 76,220	$ 76,220
TOTAL	**-**	**-**	**-**	**-**	**-**	**141**	**302**	**117**	**55**	**8**	**623**
AVG. PAY	**-**	**-**	**-**	**-**	**-**	**$ 78,315**	**$ 78,224**	**$ 80,312**	**$ 84,003**	**$ 85,490**	**$ 79,240**

Average Age: 54.20 Average Service: 27.75

SUMMARY OF ACTIVE AND DROP PARTICIPANTS
AS OF JULY 1, 2021

	YEARS OF SERVICE										
Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & UP	Total
UNDER 25	12	25	-	-	-	-	-	-	-	-	37
Avg. Pay	$ 48,820	$ 47,879	-	-	-	-	-	-	-	-	$ 48,184
25 TO 29	21	121	75	-	-	-	-	-	-	-	217
Avg. Pay	$ 49,461	$ 50,567	$ 60,696	-	-	-	-	-	-	-	$ 53,960
30 TO 34	16	148	322	48	-	-	-	-	-	-	534
Avg. Pay	$ 49,237	$ 51,278	$ 61,217	$ 68,006	-	-	-	-	-	-	$ 58,714
35 TO 39	4	64	234	277	75	-	-	-	-	-	654
Avg. Pay	$ 40,715	$ 52,059	$ 60,337	$ 68,125	$ 74,260	-	-	-	-	-	$ 64,302
40 TO 44	-	4	67	192	423	36	-	-	-	-	722
Avg. Pay	-	$ 55,716	$ 59,938	$ 67,651	$ 72,363	$ 77,903	-	-	-	-	$ 70,141
45 TO 49	-	-	3	84	338	195	40	-	-	-	660
Avg. Pay	-	-	$ 62,935	$ 65,819	$ 71,862	$ 78,029	$ 80,065	-	-	-	$ 73,371
50 TO 54	-	-	-	1	147	185	157	53	1	-	544
Avg. Pay	-	-	-	$ 58,972	$ 72,132	$ 76,663	$ 79,489	$ 81,823	$ 98,002	-	$ 76,764
55 TO 59	-	-	-	-	5	63	80	51	29	-	228
Avg. Pay	-	-	-	-	$ 67,620	$ 74,950	$ 76,076	$ 79,724	$ 82,915	-	$ 77,265
60 TO 64	-	-	-	-	-	1	27	10	25	5	68
Avg. Pay	-	-	-	-	-	$ 69,010	$ 76,029	$ 74,366	$ 85,696	$ 91,052	$ 80,340
65 TO 69	-	-	-	-	-	-	-	3	1	2	6
Avg. Pay	-	-	-	-	-	-	-	$ 83,430	$ 71,070	$ 76,220	$ 78,967
70 & UP	-	-	-	-	-	-	-	-	-	1	1
Avg. Pay	-	-	-	-	-	-	-	-	-	$ 76,220	$ 76,220
TOTAL	**53**	**362**	**701**	**602**	**988**	**480**	**304**	**117**	**56**	**8**	**3,671**
AVG. PAY	**$ 48,588**	**$ 50,993**	**$ 60,753**	**$ 67,627**	**$ 72,277**	**$ 77,071**	**$ 78,359**	**$ 80,312**	**$ 84,215**	**$ 85,490**	**$ 68,470**

Average Age: 42.28 Average Service: 14.95

SUMMARY OF INACTIVE PARTICIPANTS
AS OF JULY 1, 2021

	NUMBER	AVERAGE AGE	ANNUAL BENEFITS ($000)	AVERAGE ANNUAL BENEFITS
BENEFITS IN PAY STATUS				
Retirees	2,482	68.0	$ 136,226	$ 54,886
Beneficiaries	663	69.8	30,815	46,478
Disabled Participants	296	65.4	15,923	53,795
Total	3,441		$ 182,964	$ 53,172
DEFERRED BENEFITS				
Vested Terminated Participants	156	37.2	$ 372[1]	$ 12,829[2]
Beneficiaries	N/A		N/A	N/A
Disabled Participants	N/A		N/A	N/A
Total	156		$ 372	$ 12,829

[1] *Does not include $3,704,647 in pending refunds.*
[2] *Average is over 29 members not due pending refunds*

PARTICIPANT DATA RECONCILIATION

	ACTIVE	DROP	DEFERRED VESTED	RETIRED	TOTAL
NUMBER OF MEMBERS AS OF JULY 1, 2020	3,038	665	141	3,410	7,254
CHANGE IN STATUS DURING THE PLAN YEAR:					
Actives who retired	(8)	(57)		65	0
Actives who terminated	(38)		38		0
Actives who entered DROP	(23)	23			0
Inactives who returned to service					0
Inactives who retired			(1)	1	0
Participants who became disabled	(2)	(2)		4	0
NO LONGER MEMBERS DUE TO:					
Death	(4)	(6)		(90)	(100)
Non-vested terminations					0
Child attained cut-off age				(6)	(6)
Benefits no longer due	(37)		(22)		(59)
NEW MEMBER DUE TO:					
Initial membership	122				122
Death of another member				57	57
Correction					0
Number of members as of July 1, 2021	3,048	623	156	3,441	7,268

RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS

	ADDED TO ROLLS		REMOVED FROM ROLLS		ROLLS AT THE END OF THE YEAR			
Period Ended	Number	Annual Benefits ($000)	Number	Annual Benefits ($000)	Number	Annual Benefits ($000)	% Increase In Annual Benefits	Average Annual Benefit
December 31, 1978	72	719	23	76	794	4,294	15.8%	5,408
December 31, 1979	67	719	21	83	840	5,008	16.6	5,962
December 31, 1980	33	473	23	84	850	5,498	9.8	6,468
December 31, 1981	61	862	38	159	873	6,097	10.9	6,983
December 31, 1982	63	644	26	171	910	6,772	11.1	7,442
December 31, 1983	54	605	39	207	925	7,403	9.3	8,003
June 30, 1984[1]	41	619	17	98	949	3,952	6.8	8,328
June 30, 1985	75	968	53	290	971	8,432	6.7	8,684
June 30, 1986	54	752	38	243	987	9,550	13.3	9,676
June 30, 1987	76	1,101	33	235	1,030	10,522	10.2	10,215
June 30, 1988	121	2,002	38	311	1,113	12,754	21.2	11,459
June 30, 1989	74	1,306	42	299	1,145	14,032	10.0	12,255
June 30, 1990	111	1,996	37	288	1,219	16,428	17.1	13,477
June 30, 1991	129	1,784	38	401	1,310	17,888	8.9	13,665
June 30, 1992	78	1,588	44	401	1,344	19,866	11.1	14,781
June 30, 1993	82	1,717	48	585	1,378	21,516	8.3	15,614
June 30, 1994	112	2,006	58	660	1,432	23,297	8.3	16,269
June 30, 1995	87	1,728	28	353	1,491	25,142	7.9	16,863
June 30, 1996	67	1,402	56	660	1,502	26,379	4.9	17,563
June 30, 1997	56	1,050	37	487	1,521	27,581	4.6	18,133
June 30, 1998	54	1,064	43	477	1,532	28,675	4.0	18,717

[1] *Six-month period*

RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS

	ADDED TO ROLLS		REMOVED FROM ROLLS		ROLLS AT THE END OF THE YEAR			
Period Ended	Number	Annual Benefits ($000)	Number	Annual Benefits ($000)	Number	Annual Benefits ($000)	% Increase in Annual Benefits	Average Annual Benefit
June 30, 1999	64	1,840	28	551	1,568	30,233	5.4	19,281
June 30, 2000	95	2,364	71	1,167	1,592	34,583	14.4	21,723
June 30, 2001	127	3,581	47	775	1,672	38,347	10.9	22,935
June 30, 2002	172	5,493	61	998	1,783	44,300	15.5	24,846
June 30, 2004[1]	377	N/A	109	N/A	2,051	57,676	30.2	28,121
June 30, 2005	135	4,353	53	1,107	2,133	62,882	9.0	29,481
June 30, 2006	195	7,231	60	1,437	2,268	70,420	12.0	31,050
June 30, 2007	106	3,822	59	1,407	2,315	74,948	6.4	32,375
June 30, 2008	166	9,334	21	828	2,460	98,216	31.0	39,925
June 30, 2009	133	3,369	43	2,081	2,550	94,536	-3.7	37,073
June 30, 2010	162	7,159	103	2,886	2,609	96,580	2.2	37,018
June 30, 2011	181	8,905	64	1,489	2,726	106,832	10.6	39,190
June 30, 2012	141	7,042	77	2,398	2,790	114,176	6.8	40,923
June 30, 2013	170	8,286	54	1,837	2,906	124,080	8.7	42,698
June 30, 2014	162	7,772	70	1,401	2,998	132,749	7.0	44,279
June 30, 2015	147	7,273	85	383	3,060	140,629	5.9	45,957
June 30, 2016	138	7,496	60	2,302	3,138	150,005	6.7	47,803
June 30, 2017	207	11,829	95	3,667	3,250	162,671	8.4	50,053
June 30, 2018	150	8,353	88	2,546	3,312	169,601	4.3	51,208
June 30, 2019	114	6,432	81	3,818	3,345	173,433	2.3	51,848
June 30, 2020	148	8,388	83	3,821	3,410	179,050	3.2	52,508
June 30, 2021	127	6,730	96	4,510	3,441	182,964	2.2	53,172

[1] *Two-year period*

ACTUARIAL STANDARD OF PRACTICE NO. 51 DISCLOSURES

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities and the corresponding funded status of the Fund. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the Fund. Understanding the risks to the funding of the Fund is important. Therefore, an Actuarial Standard of Practice (ASOP) has been adopted. Actuarial Standard of Practice No. 51 (ASOP 51) requires certain disclosures of potential risks to the Fund and provides useful information for intended users of actuarial reports that determine Fund contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative but all risk should be understood and accepted based on knowledge, judgment and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the Fund.

In the actuary's professional judgment, the following risks may reasonably be anticipated to significantly affect the plan's future financial condition:

- Investment risk – the risk that assets will have a lower return than expected
- Contribution risk – the risk that the actual contribution made will be different than the recommended contribution in the Risk Sharing Valuation Study
- Salary increase risk – the risk that actual salary increases will be higher than expected
- Longevity and other demographic risk – the risk that mortality or other demographic experience will be different from expected

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the Fund. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the Fund sponsor to make contributions to the Fund. In addition, this Risk Sharing Valuation Study report in not intended to provide investment advice or to provide guidance on the management or reduction of risk. Buck welcomes the opportunity to assist in such matters as part of a separate project or projects utilizing the appropriate staff and resources for those objectives.

ASSESSMENT OF RISKS

- Investment return - One type of investment risk is that assets materially underperform expected return.

  - Lower assets mean higher unfunded liability and larger contribution amounts. For example, if returns on assets at market value were 1% less than actual, this would reduce the actuarial value of assets by approximately $8,000,000, which would increase the estimated City Contribution for Fiscal Year 2023 contribution by $544,000.
  - The five-year smoothing method used for the actuarial value of assets defers a portion of investment gain/loss in each of the previous five years. If the assumed return on assets consistently overestimates the actual return on assets, the actuarial value of assets will be consistently higher than the true market value. Consistent underestimation of the unfunded liability can prevent the Fund from achieving anticipated funding goals even when all minimum required contributions are made timely.

- Asset growth does not keep pace with liability increases over time - Another type of investment risk is that asset returns do not keep pace with liability growth over time. Fund liabilities are based on the discounted present value of anticipated future benefit payments. That present value grows at the discount rate as time passes and the future payouts move closer. If investment returns are lower than the rates used to discount liabilities, Fund liabilities will increase more rapidly than Fund assets. Over extended periods of time, such as those involved in pension obligations, these discrepancies can accumulate to significant shortfalls.

- Market shocks or regime changes - Invested assets are subject to significant disruptions from market shocks, such as the financial crisis of 2008/2009, or as a result of systemic regime changes that persist for years, such as historically low interest rates over the recent decade. These shocks or changes will increase the risk that investments will underperform the expected return. They may also lead to a need to lower the long-term return on assets assumption. Since the long-term return on asset assumption is also used for discounting liabilities a lower assumption will increase liabilities and recommended contributions. Currently the investment return assumption used for funding is set by Senate Bill 2190.

- Salary increases - Fund costs are sensitive to salary increases, with higher rates leading to higher obligations. This is because benefits at retirement are pay related, meaning that higher pay generates higher benefit levels at retirement. Compensation increases greater than assumed lead to actuarial losses since projected benefits are higher than predicted by assumed rates.

- The Fund provides certain eligible members to enter the Deferred Retirement Option Program (DROP). It allows members who elect DROP the option to continue to work beyond their standard or alternative service eligibility date and convert part of their retirement benefit into a lump sum.

  - A DROP presents a risk due to large lump sums paid, particularly during economic downturns. Another investment consideration is the need for liquid assets to pay DROP lump sums as employees and retirees may elect to receive their DROP account at any time creating either the necessity to maintain larger allocations of cash to pay these large lump sum benefits or force the Fund to sell securities or other illiquid investments at inopportune times. These payments are less predictable than monthly retirement benefits and may cause some losses.
  - The DROP provided by the Fund also presents risk due to investment return provided to the DROP account. The Fund provides DROP investment return at the rate of 65% of the Fund's earnings/losses averaged over a five-year period. When the average is a loss, the DROP account is only decreased by 65% of the loss rate and the Fund has to absorb the remaining 35%. However, this risk is also mitigated by the 65% factor - when the average is an earning, the Fund gets to keep the extra 35% earnings.

- Longevity and other demographic risks - Potential that mortality or other demographic experience (retirement, turnover, disability) may be different than expected. As the Fund matures and the majority of participants reach (or have reached) retirement eligibility, risks associated when participants retire can become significant. The Fund provides for unreduced early retirement benefits after meeting certain age and service conditions. These benefits are highly subsidized and thus can be significantly more valuable than normal retirement benefits and regular early retirement benefits. The demographic assumptions used to determine the Risk Sharing Valuation Study attempt to account for unreduced early retirement based on historical plan experience. However, due to the unpredictable nature of such benefits, future experience could differ significantly from past experience.

In addition to the risk that participants will not retire as expected, the Fund is subject to longevity risk -the risk that participants will live longer (or shorter) than expected. Cost of living adjustments (COLA) provided by the Fund increase longevity risk because if a participant lives longer than expected more COLA will be provided.

- Declining active workforce - since the City's contributions are based on a percentage of participant's salaries, a declining active workforce will have the impact of the Fund potentially receiving lower contributions. In addition, if the required dollar amount of contributions remain level or increase, a declining active workforce will result in higher contribution rates in order to meet required contribution levels.

- Contribution risk – risk of not contributing an actuarially determined contribution. Based on the statutory requirements of Senate Bill 2190 it is our understanding that the actual City contribution rate may be established as an average of the contribution rates shown in this report and those shown in the Risk Sharing Valuation Study prepared by the City's actuary. If future contributions are established in this manner at levels below those presented in this report, the Fund may not be expected to achieve a fully funded position over the 30-year time horizon as contemplated in the statute based on the data, assumptions and methods set forth in this report.

- Ultimate Entry Age Normal Cost Method (Ultimate EANC) - The Ultimate EANC method is a variation of EANC, where the normal cost is calculated for each active member based on the Fund provisions applicable to new members of the Fund. As the Fund has a lower annual cost for new members hired on or after July 1, 2017, use of the Ultimate EANC method lowers the normal cost and increases the actuarial accrued liability, as compared to EANC.

HISTORICAL RESULTS

The following table shows selected historical values of key Risk Sharing Valuation Study measures. These items illustrate how actual volatility has impacted the Fund in recent years and gives additional context to the risks described above. Further information can be found in the RSVS reports for each year.

($1,000) RSVS Date	07/01/17	07/01/18	07/01/19	07/01/20	Current RSVS 07/01/21
Liabilities and Assets at Valuation Date					
Actuarial Accrued Liability (AAL)	4,827,721	4,948,133	5,057,759	4,932,307	4,881,608
Normal Cost	69,304	69,741	70,345	61,078	60,907
Actuarial Value of Assets (AVA)	3,883,807	4,027,079	4,190,934	4,251,851	4,550,468
Funded Percent (AVA)	80%	81%	83%	86%	93%
Market Value of Assets (MVA)	4,025,090	4,170,354	4,237,692	4,102,932	5,256,763
Funded Percent (MVA)	83%	84%	84%	83%	108%
Contributions and Disbursements for Plan Year Ended	**2017**	**2018**	**2019**	**2020**	**2021**
Actuarially Determined Contribution (ADC)	88,745	96,530	99,676	96,332	88,104
Actual Contribution	93,658	83,010	89,897	83,837	77,495
Disbursements	256,590	295,674	278,615	336,153	291,767
Rates of Return for Plan Year Ended	**2017**	**2018**	**2019**	**2020**	**2021**
Assumed	7.00%	7.00%	7.00%	7.00%	7.00%
AVA	8.00%	8.40%	8.10%	6.90%	11.60%
MVA	11.80%	8.20%	5.40%	2.00%	33.40%
Maturity Measures at Valuation Date					
Payroll	289,947	260,345	272,498	259,235	243,045
Asset Volatility Ratio (AVA / Payroll)	13.4	15.5	15.4	16.4	18.7
Liability Volatilty Ratio (AAL / Payroll)	16.7	19.0	18.6	19.0	20.1
Retiree and Beneficiary (In-pay) Liability	3,270,639	3,381,597	3,445,240	3,428,579	3,454,553
Percent of Total Liability	68%	68%	68%	70%	71%
Contributions minus Disbursements in Prior Year	(162,932)	(212,664)	(188,718)	(252,316)	(214,272)
Percent Market Value of Assets	(4.0%)	(5.1%)	(4.5%)	(6.1%)	(4.1%)

COMMENTARY ON PLAN MATURITY MEASURES

The ratio of retired life actuarial accrued liability to total actuarial accrued liability

A mature plan will often have a ratio above 60 - 65 percent. A higher percentage will generally indicate an increased need for asset / liability matching due to inability to absorb volatility in future returns. Also, an increasing percentage may indicate a need for a less risky asset allocation which may lead to a lower long-term return on assets assumption and increased costs.

The ratio of cashflow to market value of assets

The cashflow as a percentage of assets means the Fund may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not garner the same returns as less liquid assets and therefore increase the investment risk. However, there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. This maturity measure should be monitored for continual upward trend with greater magnitude.

The ratio of actuarial value of assets to participant payroll

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, if lower than expected asset return increases the unfunded liability of two plans by the same percent the plan with a higher assets-to-payroll ratio may experience higher contribution volatility than a plan with a lower asset-to-payroll ratio.

BUCK

June 8, 2022

Mr. Tim Schauer
Executive Director
Houston Firefighters' Relief and Retirement Fund
4225 Interwood North Parkway
Houston, Texas 77032

Re: Addendum to the July 1, 2021 Proposed Risk Sharing Valuation Study

This addendum is incorporated and made part of the attached July 1, 2021 Proposed Risk Sharing Valuation Study (Proposed RSVS) for the Houston Firefighters' Relief and Retirement Fund (Fund). Unless otherwise stated, the results presented in this addendum were prepared using the same data, methods and actuarial assumptions that have been used for the Proposed RSVS. Please refer to the Proposed RSVS report for all the other assumptions, methods and caveats related to this addendum.

Buck published its Proposed RSVS on November 24, 2021 pursuant to our engagement to provide actuarial services to the Fund. The Proposed RSVS developed the estimated municipal contribution rate for fiscal year ending June 30, 2023 (FY 2023). The Proposed RSVS was prepared, as required under Senate Bill 2190[1], for the Fund as of July 1, 2021. The Proposed RSVS reflects the benefit provisions of the Fund as amended by and funding policies mandated by Senate Bill 2190, but without regard to Section 13E.

Since the Fund's and the City's estimated municipal contribution rate were within two percentage points, the Fund's RSVS (the Proposed RSVS) is considered to be the final July 1, 2021 RSVS. However, since the estimated FY 2023 municipal contribution rate of 22.55% was less than the initial RSVS' FY 2023 minimum contribution rate of 26.89% and the Fund's statutory funded level of 93.2% exceeded 90.0% (but was less than 100%), this addendum presents the implementation of the required adjustments under §13E(c) of HFRRF's governing statute, as follows:

i. Adjusting the actuarial value of assets equal to the current market value of assets under §13E(c)(1) does not cause the municipal contribution rate to increase;

ii. An agreement was not reached between the Fund and the City under §13E(c)(2) and §13E(c)(3) by April 30th;

iii. Consequently, the Fund has accelerated the payoff year of the legacy liability to the extent required to increase the estimated municipal contribution rate to equal the minimum contribution rate in accordance with §13E(c)(4).

1 This Risk Sharing Valuation Study has been provided without waiving the Fund's right to litigate the constitutionality of SB2190.

The following sections of the Proposed RSVS have been revised, in accordance with §13E(c) of HFRRF's governing statute.

Revised Amortization Schedule as of July 1, 2021 ($000) (Original on page 65 of Proposed RSVS)

Plan Year Ending	Initial Liability Layer	Liability Layer as of July 1, 2021	Remaining Amortization Payments as of July 1, 2021	Payment for Fiscal Year 2023	As a % of Fiscal Year 2023 Payroll[2]
June 30, 2016	$ 900,223	$ 1,000,584	13	$ 99,686	38.50%
June 30, 2017	(19,325)	(21,240)	13[1]	(2,116)	(0.82)%
June 30, 2018	(32,368)	(35,217)	13[1]	(3,509)	(1.36)%
June 30, 2019	(61,676)	(66,504)	13[1]	(6,626)	(2.56)%
June 30, 2020	(190,421)	(203,750)	13[1]	(20,299)	(7.84)%
June 30, 2021	(342,733)	(342,733)	13[1]	(36,305)	(14.02)%
Total		$ 331,140		$ 30,831	11.91%

Revised Risk Sharing Valuation Results[3] (Original on page 63 of Proposed RSVS)

		2021 Risk Sharing Valuation Results	
($000)	2020 Risk Sharing Valuation Results	Proposed RSVS (Published November 24, 2021)	Adjustments in accordance with §13E(c)(4)
Present Value of Future Benefits	$ 5,626,313	$ 5,562,116	$ 5,562,116
Actuarial Accrued Liability	$ 4,932,307	$ 4,881,608	$ 4,881,608
Actuarial Value of Assets	$ 4,251,851	$ 4,550,468	$ 4,550,468
Unfunded Accrued Liability	$ 680,456	$ 331,140	$ 331,140
Funded Ratio	86.2%	93.2%	93.2%
City Normal Cost Rate[4]	14.89%	14.98%	14.98%
City Accrued Liability Rate	15.91%	7.57%	11.91%
Total City Contribution Rate[5]	30.80%	22.55%	26.89%
Estimated City Contribution for following Fiscal Year	$ 80,253	$ 58,381	$ 69,617
Employee Contribution Rate	10.50%	10.50%	10.50%

[1] Per SB 2190, the amortization period for a new liability gain layer is equal to the remaining amortization period on the largest remaining liability loss layer.
[2] Based on projected pensionable compensation of $258,896,000.
[3] This Risk Sharing Valuation Study has been provided without waiving the Fund's right to litigate the constitutionality of SB2190.
[4] Contains an allowance for administrative expenses equal to 1.25% of payroll.
[5] As a percentage of pensionable compensetion.

Actuarial Certification

We certify that the information contained in this addendum to the July 1, 2021 Proposed RSVS has been prepared in accordance with the appropriate Actuarial Standards of Practice. Unless otherwise stated, the results presented herein were prepared using the same data, methods and actuarial assumptions that have been used for the Proposed RSVS. A summary of the actuarial assumptions and methods, major Fund provisions, and Fund participant data used to calculate the results of this study can be found in the appendices of the attached July 1, 2021 Proposed RSVS report.

Please refer to the Proposed RSVS report for the Actuarial Standard of Practice (ASOP) No. 51 disclosures. In addition to the "Contribution risk" discussion, the implementation of Section 13E accelerates the amortization of the Fund's liability layers and establishes a contribution rate that is greater than determined by the Proposed RSVS. If future contributions are established in this manner at levels greater than those presented in the Proposed RSVS, the Fund may achieve a fully funded position earlier than the 30-year time horizon contemplated in the statute based on the data, assumptions and methods set forth in the Proposed RSVS. On the other hand, the shorter amortization period may significantly increase future actuarially determined contributions, increasing the risk that such amounts are not contributed.

Please refer to the Proposed RSVS report for Actuarial Standard of Practice (ASOP) No. 56 disclosures. ASOP No. 56 provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models.

I am a Fellow of the Society of Actuaries and Member of the American Academy of Actuaries. I meet the Academy's Qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

If you have any questions concerning this information, please let me know.

Respectfully submitted,

Buck Global, LLC

Michael A. Ribble

Michael A. Ribble, FSA, EA, MAAA, FCA
Principal, Consulting Actuary

Attached: July 1, 2021 Proposed Risk Sharing Valuation Study dated November 24, 2021

SECTION 05

STATISTICAL INFORMATION

INTRODUCTION

The Statistical section of the Houston Firefighters' Relief and Retirement Fund's Comprehensive Annual Financial Report presents detailed information related to the financial statements. The schedules within the Statistical section are classified into the following three categories: Financial Trends, Revenue Capacity and Operating Information. All information was derived from Audited Annual Financials and/or our member services database system.

FINANCIAL TRENDS

The Revenue by Source presents the member and employer contributions, as well as the net investment income/loss for the 10 years ending June 30, 2022.

The Fund's investment returns have the most significant impact on the additions to plan net position.

The Expenses by Type presents the benefits, refunds of contributions and administrative expenses for the 10 years ending June 30, 2022. The Fund's benefits payments have the most significant impact on the total deductions from plan net position.

The Benefit Expenses by Type presents the amount of benefit payments and refunds by type for the 10 years ending June 30, 2022. Most benefit types are monthly retirement benefits.

The Statement of Changes in Plan Net Position is a schedule combining the additions to and deductions from plan net position from the schedule of Revenue by Source and schedule of Expenses by Type to arrive at net increase/decrease to changes in plan net position for the 10 years ending June 30, 2022.

REVENUE CAPACITY

The Schedule of Investment Income presents the details of the total net investment gain/loss for the 10 years ending June 30, 2022. The Fund has two outside sources of revenue and one own-source (internal) of revenue. Employer contributions and member contributions, provided in the schedule of Revenue by Source, are the two outside sources of revenue and investment income is the Fund's own-source revenue. Since investment income is the largest source of revenue to the Fund, this schedule provides more detail on the major components of the investment income, which is also disclosed in total on the schedule of Revenue by Source.

OPERATING INFORMATION

The schedule of Retired Members by Type of Benefit presents, for given benefit ranges, the total number of retirees, total monthly benefits and total number of retirees by retirement type as of June 30, 2022.

The schedule of Average Monthly Benefit Payments and Average Final Average Salary of Retired Members presents, in five-year increments of credited service, the average monthly benefit, the average final average salary and the number of retired members for the 10 years ending June 30, 2022.

The schedule of Participating Employers and Active Members provides the number of covered employees and the corresponding percentage of participation who worked within the City of Houston for the 10 years ending June 30, 2022.

Some of these terms are used in the Investment section. Others are used throughout this report. Definitions are provided as they relate to the Houston Firefighters' Relief and Retirement Fund.

REVENUE BY SOURCE AND EXPENSES BY TYPE

REVENUES BY SOURCE — ACCRUAL BASIS
(DOLLARS IN THOUSANDS)

Fiscal Year (Ending June 30)	Employee Contributions	Employer Contributions	Employer Contributions as a Percentage of Annual Covered Payroll	Investment Income (or Loss) Based on Fair Value	Other	Total
2022	$ 30,942	$ 81,351	31.89%	$ 523	N/A	**$ 112,816**
2021	29,873	77,495	31.89%	1,338,230	N/A	**1,445,598**
2020	33,441	83,837	32.34%	84,115	N/A	**201,393**
2019	34,281	89,897	32.99%	221,775	N/A	**345,953**
2018	35,622	83,010	31.89%	322,306	N/A	**440,938**
2017	25,404	93,658	33.20%	432,948	N/A	**552,010**
2016	25,511	94,279	33.20%	(49,877)	N/A	**69,913**
2015	25,092	92,609	33.20%	49,538	N/A	**167,239**
2014	23,994	64,338	23.90%	589,518	N/A	**677,850**
2013	23,382	62,129	23.90%	353,563	N/A	**439,074**

EXPENSES BY TYPE — ACCRUAL BASIS
(DOLLARS IN THOUSANDS)

Fiscal Year (Ending June 30)	Benefit Payments (excludes contribution refunds)	Professional and Administrative Expenses	Contribution Refunds	Total
2022	$ 268,371	$ 5,243	$ 2,228	**$ 275,842**
2021	283,989	5,353	2,425	**291,767**
2020	327,324	5,830	2,999	**336,153**
2019	270,862	6,217	1,536	**278,615**
2018	287,499	6,567	1,608	**295,674**
2017	248,354	7,196	1,040	**256,590**
2016	211,128	6,221	545	**217,894**
2015	195,493	6,052	869	**202,414**
2014	186,333	8,343	785	**195,461**
2013	175,229	8,009	531	**183,769**

BENEFIT EXPENSES BY TYPE

	2022	2021	2020	2019	2018
Refunds of Contributions	$ 2,227,893	$ 2,425,034	$ 2,998,517	$ 1,535,913	$ 1,608,192
Death Benefits	235,000	337,519	215,000	225,000	257,834
Deferred Retirees	860,512	738,592	742,861	780,953	797,865
Off-Duty Disabilities	1,199,996	1,188,487	1,281,164	1,367,276	1,394,832
Annual Supplemental Benefit payments	4,981,186	4,984,503	4,976,920	5,026,767	4,921,757
On-Duty Disabilities	15,361,749	14,811,532	14,843,981	15,027,536	15,078,051
Survivors	32,046,027	30,197,101	28,931,410	27,356,913	25,720,614
DROP Distributions	69,116,984	92,752,345	140,354,145	87,129,577	107,379,424
PROP Distributions	3,152,190	3,822,165	5,117,648	4,133,561	6,603,511
Service Retirees	141,417,189	135,156,911	130,861,303	129,814,823	125,345,352
Total	**$ 270,598,726**	**$ 286,414,189**	**$ 330,322,949**	**$ 272,398,319**	**$ 289,107,432**

	2017	2016	2015	2014	2013
Refunds of Contributions	$ 1,040,443	$ 544,717	$ 868,618	$ 784,927	$ 530,855
Death Benefits	192,500	70,000	201,307	275,000	230,000
Deferred Retirees	768,216	734,911	714,034	664,105	634,839
Off-Duty Disabilities	1,345,691	1,340,299	1,304,230	1,365,538	1,637,878
Annual Supplemental Benefit Payments	4,627,341	4,784,758	4,677,602	4,734,007	4,964,072
On-Duty Disabilities	14,097,847	14,058,318	13,740,358	13,036,729	13,124,891
Survivors	23,749,166	22,388,261	20,659,074	19,259,056	19,921,710
DROP Distributions	88,239,148	62,900,364	55,070,516	54,680,454	52,595,305
PROP Distributions	5,712,650	4,013,603	3,866,657	2,982,844	2,845,353
Service Retirees	109,621,105	100,837,387	95,259,573	89,335,022	79,274,499
Total	**$ 249,394,107**	**$ 211,672,618**	**$ 196,361,969**	**$ 187,117,682**	**$ 175,759,402**

STATEMENT OF CHANGES IN PLAN NET POSITION LAST 10 FISCAL YEARS

	2022	2021	2020	2019	2018
ADDITIONS					
Employer Contributions	$ 81,351,512	$ 77,495,206	$ 83,836,678	$ 89,897,222	$ 83,010,066
Member Contributions	30,941,552	29,873,223	33,441,101	34,281,171	35,621,787
Net Investment Income (net of expenses)	522,517	1,338,229,965	84,114,982	221,775,210	322,306,521
Other	-	-	-	-	-
Total Additions	**$ 112,815,581**	**$ 1,445,598,394**	**$ 201,392,761**	**$ 345,953,603**	**$ 440,938,374**
DEDUCTIONS					
Total Benefit Expenses (see Benefit Expenses by Type)	$ 270,598,726	$ 286,414,189	$ 330,322,949	$ 272,398,319	$ 289,107,432
Administrative & Professional Expense	5,243,204	5,353,176	5,830,113	6,217,169	6,566,644
Total Deductions	**$ 275,841,930**	**$ 291,767,365**	**$ 336,153,062**	**$ 278,615,488**	**$ 295,674,076**
Change in Plan Net Positions	$ (163,026,349)	$ 1,153,831,029	$ (134,760,301)	$ 67,338,115	$ 145,264,298
Plan Net Position Beginning of Year	5,256,762,808	4,102,931,779	4,237,692,080	4,170,353,965	4,025,089,667
Plan Net Position End of Year	$ 5,093,736,459	$ 5,256,762,808	$ 4,102,931,779	$ 4,237,692,080	$ 4,170,353,965

	2017	2016	2015	2014	2013
ADDITIONS					
Employer Contributions	$ 93,657,800	$ 94,279,235	$ 92,609,565	$ 64,337,994	$ 62,128,451
Member Contributions	25,403,621	25,510,801	25,091,582	23,993,560	23,382,322
Net Investment Income (net of expenses)	432,948,121	(49,876,872)	49,538,145	589,517,944	353,563,220
Other	-	-	-	-	-
Total Additions	**$ 552,009,542**	**$ 69,913,164**	**$ 167,239,292**	**$ 677,849,498**	**$ 439,073,993**
DEDUCTIONS					
Total Benefit Expenses (see Benefit Expenses by Type)	$ 249,394,107	$ 211,672,618	$ 196,361,969	$ 187,117,682	$ 175,759,402
Administrative & Professional Expense	7,195,777	6,221,053	6,052,085	8,343,246	8,009,239
Total Deductions	**$ 256,589,884**	**$ 217,893,671**	**$ 202,414,054**	**$ 195,460,928**	**$ 183,768,641**
Change in Plan Net Positions	$ 295,419,658	$ (147,980,507)	$ (35,174,762)	$ 482,388,570	$ 255,305,352
Net Position Held in Trust, Beginning of Year	3,729,670,009	3,877,650,516	3,912,825,278	3,430,436,708	3,175,131,356
Net Position Held in Trust, End of Year	$ 4,025,089,667	$ 3,729,670,009	$ 3,877,650,516	$ 3,912,825,278	$ 3,430,436,708

SCHEDULE OF INVESTMENT INCOME
LAST 10 FISCAL YEARS

	2022	2021	2020	2019	2018
INVESTMENT GAIN (LOSS)					
Net appreciation/(depreciation) in fair value of investments	$ 1,146,381	$ 1,330,056,713	$ 66,752,612	$ 194,215,973	$ 297,201,824
Interest	5,585,459	14,522,710	22,496,378	26,356,712	26,478,055
Dividends	1,214,454	1,010,208	1,005,808	5,719,922	4,127,663
Earnings from private equity	379,907	514,997	422,877	1,278,241	838,456
Earnings from real estate	34,685	92,379	37,425	41,890	3,320
Miscellaneous	100,317	22,190	146,003	517,980	319,007
Total Investment Gain (Loss)	8,461,203	$ 1,346,219,197	$ 90,861,103	$ 228,130,718	$ 328,968,325
Investment expenses	(8,140,843)	(8,105,569)	(6,815,731)	(6,484,550)	(6,899,091)
Net Gain (Loss) from Investing Activities	**$ 320,360**	**$ 1,338,113,628**	**$ 84,045,372**	**$ 221,646,168**	**$ 322,069,234**
FROM SECURITIES LENDING ARRANGEMENTS:					
Earnings	202,157	55,354	165,061	508,428	544,765
Rebates and fees	-	60,983	(95,451)	(379,386)	(307,478)
Net income from securities lending activities	202,157	$ 116,337	$ 69,610	$129,042	$ 237,287
Total Net Investment Gain (Loss)	**$ 522,517**	**$ 1,338,229,965**	**$ 84,114,982**	**$ 221,775,210**	**$ 322,306,521**

	2017	2016	2015	2014	2013
INVESTMENT GAIN (LOSS)					
Net appreciation/(depreciation) in fair value of investments	$ 389,903,955	$ (116,953,736)	$ (23,687,040)	$ 504,461,380	$ 272,673,315
Interest	42,964,571	57,621,249	57,318,547	59,395,942	58,307,673
Dividends	4,660,644	16,298,917	25,615,080	29,493,785	24,692,127
Earnings from private equity	1,228,446	702,437	967,410	4,681,493	3,703,269
Earnings from real estate	60,958	58,453	158,620	206,442	1,442,371
Miscellaneous	583,284	1,699,257	373,816	485,993	904,044
Total Investment Gain (Loss)	$ 439,401,858	$ (40,573,423)	$ 60,746,433	$ 598,725,035	$ 361,722,799
Investment expenses	(6,833,460)	(9,854,548)	(11,786,187)	(9,700,881)	(8,687,653)
Net gain (Loss) from Investing Activities	**$ 432,568,398**	**$ (50,427,971)**	**$ 48,960,246**	**$ 589,024,154**	**$ 353,035,146**
FROM SECURITIES LENDING ARRANGEMENTS:					
Earnings	339,129	253,620	235,556	120,060	183,530
Rebates and fees	40,594	297,479	342,343	373,730	344,544
Net income from securities lending activities	$ 379,723	$ 551,099	$ 577,899	$ 493,790	$ 528,074
Total Net Investment Gain (Loss)	**$ 432,948,121**	**$ (49,876,872)**	**$ 49,538,145**	**$ 589,517,944**	**$ 353,563,220**

NUMBER OF BENEFIT RECIPIENTS BY TYPE AND MONTHLY BENEFIT AMOUNT

(as of June 30, 2021)

BENEFIT AMOUNT RANGE	TOTAL BENEFIT RECIPIENT COUNT	SERVICE	DISABILITY	WIDOW	CHILDREN	PARENT	DEFERRED	INACTIVE	QDRO
0	9	4	2	3	0	0	0	0	0
1-200	10	0	0	1	0	0	0	0	9
201-400	34	0	0	3	1	0	1	0	29
401-600	53	0	0	11	0	0	16	0	26
601-800	57	1	0	9	7	0	20	1	19
801-1000	47	0	0	8	0	0	13	4	22
1001-1200	38	0	0	4	7	0	8	5	14
1201-1400	35	0	1	5	2	0	5	3	19
1401-1600	36	2	2	8	5	0	4	6	9
1601-1800	37	3	7	9	5	0	2	1	10
1801-2000	47	8	9	15	1	0	3	3	8
OVER 2000	3,270	2,415	276	539	24	0	1	0	15
Total Benefit Count	**3,673**	**2,433**	**297**	**615**	**52**	**0**	**73**	**23**	**180**

AVERAGE MONTHLY BENEFIT PAYMENTS OF RETIRED MEMBERS

EFFECTIVE RETIREMENT DATE	YEARS OF CREDITED SERVICE						
	0-5	6-10	11-15	16-20	21-25	26-30	Over 30
July 2021 - June 2022							
Number of Service Retirements	0	0	0	9	17	15	46
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,592	$ 3,887	$ 4,814	$ 5,702
Average Final Average Salary	$ 0	$ 0	$ 0	$ 6,689	$ 7,091	$ 7,417	$ 6,628
July 2020 - June 2021							
Number of Service Retirements	0	0	0	6	11	16	37
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,669	$ 4,146	$ 4,307	$ 5,669
Average Final Average Salary	$ 0	$ 0	$ 0	$ 6,914	$ 7,328	$ 6,590	$ 6,447
July 2019 - June 2020							
Number of Service Retirements	0	0	0	4	20	21	48
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 4,084	$ 4,064	$ 4,516	$ 6,163
Average Final Average Salary	$ 0	$ 0	$ 0	$ 7,786	$ 7,056	$ 6,611	$ 6,634
July 2018 - June 2019							
Number of Service Retirements	0	0	0	2	13	16	34
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,808	$ 4,397	$ 4,445	$ 5,566
Average Final Average Salary	$ 0	$ 0	$ 0	$ 7,240	$ 7,485	$ 6,309	$ 5,851
July 2017 - June 2018							
Number of Service Retirements	0	0	0	4	16	11	62
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,275	$ 3,951	$ 4,472	$ 5,862
Average Final Average Salary	$ 0	$ 0	$ 0	$ 6,182	$ 6,735	$ 6,163	$ 5,862
July 2016 - June 2017							
Number of Service Retirements	0	0	0	3	11	11	134
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 4,199	$ 4,123	$ 3,934	$ 5,458
Average Final Average Salary	$ 0	$ 0	$ 0	$ 8,057	$ 6,691	$ 5,761	$ 5,637
July 2015 - June 2016							
Number of Service Retirements	0	0	0	1	3	4	86
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,674	$ 3,276	$ 4,570	$ 5,110
Average Final Average Salary	$ 0	$ 0	$ 0	$ 6,899	$ 5,580	$ 5,908	$ 5,284
July 2014 - June 2015							
Number of Service Retirements	0	0	0	1	6	3	76
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,682	$ 3,394	$ 3,585	$ 4,854
Average Final Average Salary	$ 0	$ 0	$ 0	$ 7,063	$ 5,398	$ 4,736	$ 5,166
July 2013 - June 2014							
Number of Service Retirements	0	0	0	2	4	5	97
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 3,199	$ 4,773	$ 3,826	$ 4,288
Average Final Average Salary	$ 0	$ 0	$ 0	$ 6,099	$ 7,726	$ 4,975	$ 4,715
July 2012 - June 2013							
Number of Service Retirements	0	0	0	0	1	13	106
Average Monthly Benefits	$ 0	$ 0	$ 0	$ 0	$ 4,356	$ 3,666	$ 4,490
Average Final Average Salary	$ 0	$ 0	$ 0	$ 0	$ 7,603	$ 4,901	$ 4,717

PARTICIPATING EMPLOYER AND ACTIVE MEMBERS

CITY OF HOUSTON	ACTIVE MEMBERS	PERCENTAGE OF COVERED EMPLOYEES
2022	3,640	100%
2021	3,655	100%
2020	3,693	100%
2019	3,914	100%
2018	4,041	100%
2017	4,097	100%
2016	4,109	100%
2015	3,939	100%
2014	3,835	100%
2013	3,750	100%

SECTION 06

GLOSSARY

DEFINITIONS

Some of these terms are used in the Investment section, beginning on page 51. Others are used throughout this report. Definitions are provided as they relate to the Houston Firefighters' Relief and Retirement Fund.

ACCRUAL BASIS OF ACCOUNTING
Accounting method in which income and expense transactions are recognized when they are earned or incurred rather than when they are settled. The Fund uses this method of accounting.

ACTIVE MANAGEMENT
A process employed by the Fund to produce better returns than those of passively managed indexed funds by use of, for example, Investment Managers and Investment Advisors which typically rely on analytical research, quantitative models, forecast, regime analysis, judgment and experience in making investment decisions.

ACTUARIAL DATA
(A) the census data, assumption tables, disclosure of methods, and financial information that are routinely used by the fund actuary for the fund's valuation studies or an actuarial experience study; and

(B) other data that is reasonably necessary.

ACTUARIAL EXPERIENCE STUDY
Defined in Section 802.1014, of the Government Code.

AMORTIZATION PERIOD
The time period necessary to fully pay a liability layer.

AMORTIZATION RATE
The sum of the scheduled amortization payments for a given fiscal year for the current liability layers divided by the projected pensionable payroll for that fiscal year.

ASSET
Anything having commercial or exchange value that is owned by the Fund.

ASSET LIABILITY MANAGEMENT STUDY (ALM STUDY)
A comprehensive periodic study commissioned by the Board to examine various aspects of the Fund's assets and liabilities including, but not limited to, asset allocation and investment strategies along with key asset and liability risk exposures.

ASSUMED RATE OF RETURN
The assumed market rate of return on fund assets, which is 7% set by statute, but 7.25% as adopted by the Board.

AVERAGE MONTHLY SALARY
If the member has participated in the fund for:

(A) three or more years, the total salary received by a member as a firefighter over the member's:

(i) highest 78 biweekly pay periods for a member hired before the year 2017 effective date, including a member who was hired before the year 2017 effective date and who involuntarily separated from service but was retroactively reinstated in accordance with an arbitration, civil service, or court ruling; or

(ii) last 78 biweekly pay periods ending before the earlier of the date the member terminates employment with the fire department, divided by 36, or the member began participation in the DROP, divided by 36; or

(B) fewer than three years, the total salary paid to the member for the periods the member participated in the fund divided by the number of months the member has participated in the fund.

If a member is not paid on the basis of biweekly pay periods, "average monthly salary" is determined on the basis of the number of pay periods under the payroll practices of the municipality sponsoring the fund that most closely correspond to 78 biweekly pay periods.

BENCHMARK
The specific standards against which the performance of securities held by the Fund in certain asset classes can be measured.

BENEFICIARY ADULT CHILD
A child of a member by birth or adoption who:

(A) is not an eligible child; and

(B) is designated a beneficiary of a member's DROP or PROP account by valid designation.

BOARD OR BOARD OF TRUSTEES
The Board of Trustees of a firefighters' relief and retirement fund.

BOOK VALUE
The value (cost) at which an asset is carried on a balance sheet.

CASH BASIS OF ACCOUNTING
Accounting method in which revenue and expense transactions are recognized when they are paid for (settled), rather than when they are incurred.

CODE
The federal Internal Revenue Code of 1986, as amended.

COMPOUND OR COMPOUNDING
The process of calculating and adding current interest to the principal and interest of a previous period(s).

COMPOUND RETURN
Profit on an investment, usually expressed as an annual percentage rate.

CONFIDENTIALITY AGREEMENT
A letter agreement sent from the municipal actuary or an independent actuary in which the municipal actuary or the independent actuary, as applicable, agrees to keep certain information confidential.

CORRIDOR
The range of municipal contribution rates that are:

(A) equal to or greater than the minimum contribution rate; and

(B) equal to or less than the maximum contribution rate.

CORRIDOR MARGIN
Five percentage points above/below the corridor midpoint.

CORRIDOR MIDPOINT
The projected municipal contribution rate specified for each fiscal year for 31 years in the initial risk sharing valuation study, and as may be adjusted, and in each case rounded to the nearest hundredths decimal place.

DEFERRED RETIREE
A member who is eligible for a benefit under Section 8(a) of the Fund's Governing Statute.

DIGITAL ASSETS
Collection of binary data, which is self-contained, uniquely identifiable, and has value. Digital Assets are issued, stored, and transferred using a distributed ledger or immutable blockchain technology and include, but are not limited to, so-called 'virtual currencies,' 'coins,' and 'tokens.'

DIVERSIFICATION
Spreading of risk by putting assets in several different categories of investments, such as stocks, bonds, cash, high-yield and hedge funds.

DROP
The deferred retirement option plan.

DROP ACCOUNT
The notional account established (prior to July 1, 2017), to reflect the credits, contributions and earnings of a member who has made a DROP election.

EMPLOYER NORMAL COST RATE
The annual actuarially calculated contribution necessary to provide employee benefits.

ESTIMATED MUNICIPAL CONTRIBUTION RATE
The municipal contribution rate estimated in a final risk sharing valuation study.

FAIR VALUE
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.

FIREFIGHTER
A full-time, fully paid, active, classified member of a regularly organized fire department of an incorporated municipality with a fund, including a member who has made a DROP election.

FISCAL YEAR
A fiscal year beginning on July 1 and ending on June 30.

FUND
A firefighters' relief and retirement fund established under this article.

FUND EQUITY (STOCK) INVESTMENTS
The portion of the total Fund that is invested in ownership interest in corporations, usually in common stock.

FUND FIXED-INCOME (BOND) INVESTMENTS
The portion of the total Fund that is invested in debt instruments that usually pay a fixed rate of interest or dividends over a specified period of time.

FUNDED RATIO
The ratio of the fund's actuarial value of assets divided by the fund's actuarial accrued liability.

INSTITUTIONAL INVESTOR ORGANIZATION
An organization that invests and trades large volumes of securities (stocks and bonds). The Fund is an institutional investor.

INVESTMENT MANAGER
An entity that manages Fund assets, usually in a separately managed account, with discretionary authority to invest within the confines of a Fund mandated investment strategy or similar Fund directive, and where the account holdings are typically maintained in the custody of the Fund's custodian bank.

INVESTMENT POLICY STATEMENT (IPS)
The investment policy statement of the Houston Firefighters' Relief and Retirement Fund as approved by the Board/Investment Committee that provides for the general investment goals and objectives of the Fund.

LEGACY LIABILITY
The unfunded actuarial accrued liability:

(A) for the fiscal year ending June 30, 2016, reduced to reflect:

- (i) changes to benefits or contributions under this article that took effect on the year 2017 effective date; and
- (ii) payments by the municipality and earnings at the assumed rate of return allocated to the legacy liability from July 1, 2016, to July 1, 2017, excluding July 1, 2017; and

(B) for each subsequent fiscal year:

- (i) reduced by the contributions for that year allocated to the amortization of the legacy liability; and
- (ii) adjusted by the assumed rate of return.

LEVEL PERCENT OF PAYROLL METHOD
The amortization method that defines the amount of the liability layer recognized each fiscal year as a level percent of pensionable payroll until the amount of the liability layer remaining is reduced to zero.

LIABILITY
Any debt of the Fund giving a creditor a claim on the assets of the Fund (i.e., the money has not yet been paid, but the event causing the obligation has already occurred).

LIABILITY GAIN LAYER
A liability layer that decreases the unfunded actuarial accrued liability.

LIABILITY LAYER
The legacy liability established in the initial risk sharing valuation study and the unanticipated change as established in each subsequent risk sharing valuation study prepared.

LIABILITY LOSS LAYER
A liability layer that increases the unfunded actuarial accrued liability.

MAXIMUM CONTRIBUTION RATE
The rate equal to the corridor midpoint plus the corridor margin.

MEAN RETURN
The average return.

MEDIAN RETURN
The midpoint return when all returns are ranked from highest to lowest — and there is an equal number of returns above and below.

MEDIAN TOTAL FUND RETURN
The midpoint return for all assets in all plans in a universe of plans.

MEMBER
A firefighter or former firefighter who has satisfied the eligibility requirements and who has not yet received a distribution of the entire benefit to which the person is entitled.

MINIMUM CONTRIBUTION RATE
The rate equal to the corridor midpoint minus the corridor margin.

MUNICIPALITY
A municipality in this state having a population of more than 2 million.

MUNICIPAL CONTRIBUTION RATE
A percent of pensionable payroll that is the sum of the employer normal cost rate and the amortization rate for liability layers, except as determined otherwise under the express provisions of Sections 13E and 13F of this article.

NORMAL COST RATE
The salary weighted average of the individual normal cost rates determined for the current active population plus an allowance for projected administrative expenses. The allowance for projected administrative expenses equals the administrative expenses divided by the pensionable payroll for the previous fiscal year, provided the administrative allowance may not exceed 1.25 percent of the pensionable payroll for the current fiscal year unless agreed to by the municipality.

NORMAL RETIREMENT AGE
(A) a member, including a member who was hired before the year 2017 effective date and who involuntarily separated from service but has been retroactively reinstated in accordance with an arbitration, civil service, or court ruling, hired before the year 2017 effective date, the age at which the member attains 20 years of service; or

(B) a member hired or rehired on or after the year 2017 effective date, the age at which the sum of the member's age, in years, and the member's years of participation in the fund equals at least 70.

PAYOFF YEAR
The year a liability layer is fully amortized under the amortization period.

PENSIONABLE PAYROLL
The aggregate salary (excluding overtime) of all the firefighters on active service, including all firefighters participating in an alternative retirement plan in an applicable fiscal year.

PORTFOLIO
Combined holding of more than one stock, bond or other asset by an individual or institutional investor.

PORTFOLIO MANAGEMENT
The process of selecting, monitoring and changing assets within a portfolio or account to meet defined investment objectives.

PRICE INFLATION ASSUMPTION
(A) the most recent headline consumer price index 10-year forecast published in the Federal Reserve Bank of Philadelphia Survey of Professional Forecasters; or

(B) another standard as determined by mutual agreement between the municipality and the board.

PRIVATE INVESTMENT
Strategies in which the Fund invests (typically through an interest in a limited partnership, limited liability company, or through some other binding agreement) in private equity, debt, or real assets not listed on a public exchange.

PROJECTED PENSIONABLE PAYROLL
The estimated pensionable payroll for the fiscal year beginning 12 months after the date of the risk sharing valuation study at the time of calculation by:

(A) projecting the prior fiscal year's pensionable payroll forward two years using the current payroll growth rate assumptions; and

(B) adjusting, if necessary, for changes in population or other known factors, provided those factors would have a material impact on the calculation, as determined by the board.

PROP
The post-retirement option plan.

PROP ACCOUNT
The notional account established to reflect the credits and contributions of a member or surviving spouse who made a PROP election before the year 2017 effective date.

RECEIVABLES
Assets to which the Fund is entitled — but has not received.

RISK APPETITE
The amount of risk that the Fund is willing to take to meet its strategic objectives.

RISK TOLERANCE
The degree of variability of investment returns relative to the assigned benchmark that the Fund is willing to accept.

THIRD QUARTER LINE RATE
The corridor midpoint plus 2.5 percentage points.

TOTAL FUND
All the investments of the Fund, including stocks, bonds, cash equivalents, high-yield bonds, private equity, real estate and hedge funds.

ULTIMATE ENTRY AGE NORMAL
An actuarial cost method under which a calculation is made to determine the average uniform and constant percentage rate of contributions that, if applied to the compensation of each member during the entire period of the member's anticipated covered service, would be required to meet the cost of all benefits payable on the member's behalf based on the benefits provisions for newly hired employees.

UNFUNDED ACTUARIAL ACCRUED LIABILITY
The difference between the actuarial accrued liability and the actuarial value of assets. For purposes of this definition:

(A) "actuarial accrued liability" means the portion of the actuarial present value of projected benefits attributed to past periods of member service based on the cost method used in an actuarial valuation study; and

(B) "actuarial value of assets" means the value of fund investments as calculated using the asset smoothing method used in valuation studies.

UNANTICIPATED CHANGE
With respect to the unfunded actuarial accrued liability in each subsequent risk sharing valuation study prepared, the difference between:

(A) the remaining balance of all then-existing liability layers as of the date of the risk sharing valuation study; and

(B) the actual unfunded actuarial accrued liability as of the date of the valuation study.

UNIVERSE
A total number of facts or events to which a specific fact or event is compared.

YEAR 2017 EFFECTIVE DATE
The date on which S.B. No. 2190, Acts of the 85th Legislature, Regular Session, 2017, took effect.

YEARS OF PARTICIPATION
The number of years that a member has participated in the fund by making the contributions required, as determined under rules established by the board.

HOUSTON FIREFIGHTERS'
RELIEF AND RETIREMENT FUND

Fiscal YearS 2022 and 2021 Annual Comprehensive Financial Report

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