2019

COMPREHENSIVE ANNUAL FINANCIAL REPORT

For fiscal years ended
September 30, 2019 and 2018

A Pension Trust Fund of the City of Fort Worth, Texas

Comprehensive Annual Financial Report

A pension trust fund of the City of Fort Worth, Texas
For Fiscal Years Ended September 30, 2019 and 2018

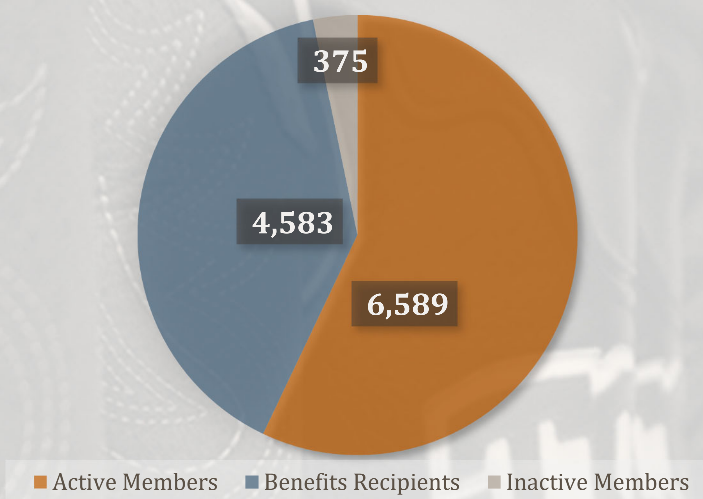
Benita Falls Harper
Executive Director

Fort Worth Employees' Retirement Fund
3801 Hulen Street, Suite 101
Fort Worth, Texas, 76107
www.fwretirement.org
817-632-8900

Prepared by the Staff of the Fort Worth Employees' Retirement Fund

2019 At-A-Glance

Membership



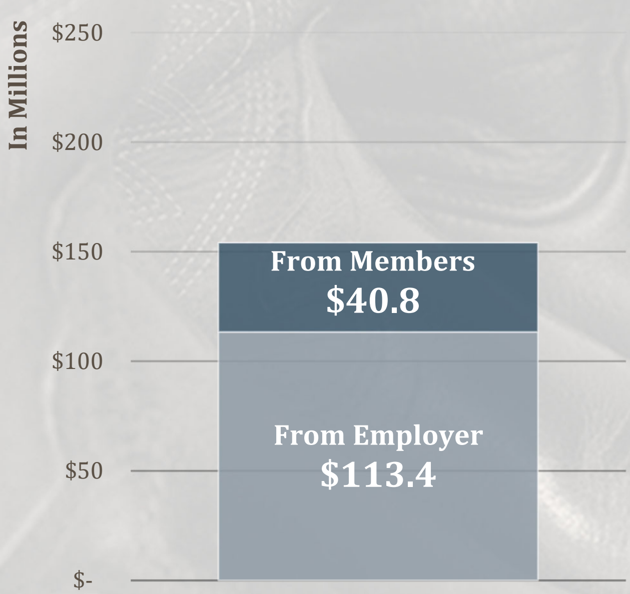
Fund Net Position

$2.3 Billion

Investment Rate of Return

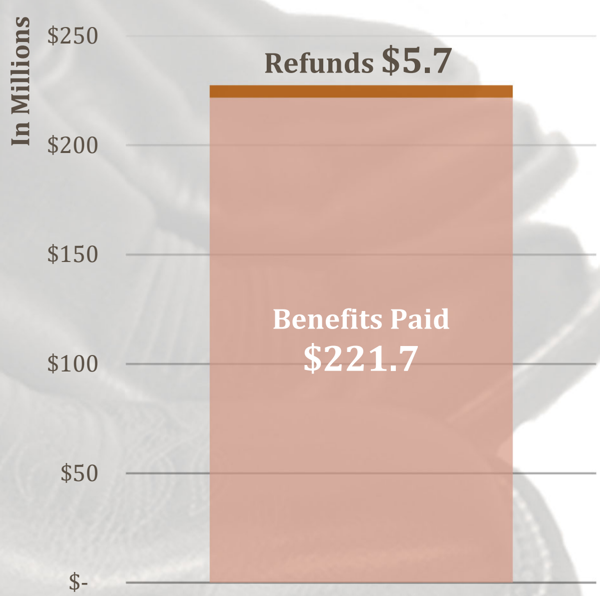
3.03%

Contributions (+)



Total: $154.2 Million

Distributions (-)



Total: $227.4 Million

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INTRODUCTORY SECTION

Tarrant County Courthouse, Downtown Fort Worth

Photo by Shiva Shenoy

Letter of Transmittal

March 13, 2020

Board of Trustees
Fort Worth Employees' Retirement Fund
3801 Hulen Street, Suite 101
Fort Worth, Texas 76107

Ladies and Gentlemen:

It is my pleasure to submit to you the Comprehensive Annual Financial Report (CAFR) of the Fort Worth Employees' Retirement Fund (the Fund) for the fiscal years ended September 30, 2019 and 2018. Our mission is to provide retirement benefits and exceptional services while sustaining our members' trust. Responsibility for both the accuracy of the data and the completeness and fairness of its presentation rests with me and the staff of the Fund. To the best of my knowledge and belief, the enclosed data is accurate in all material respects and is reported in a manner designed to present fairly the financial position and results of operations of the Fund. I trust that you and the members of the Fund will find the CAFR helpful in understanding your retirement plan.

Accounting and Internal Controls

The financial statements have been prepared in accordance with Generally Accepted Accounting Principles (GAAP) as prescribed by the Governmental Accounting Standards Board (GASB) rules. The accompanying financial statements are prepared using the accrual basis of accounting. Member and employer contributions are recognized when due, pursuant to formal commitments as well as statutory or contractual requirements. Expenses are recorded when the corresponding liabilities are incurred, regardless of when payment is made.

The Fund's independent auditors have audited the financial statements and issued unmodified opinions as of and for the years ended September 30, 2019 and 2018. The purpose of the audit is to give reasonable assurance to users of those financial statements, the Board, and participants of the Fund, that the financial statements present fairly, in all material respects, information regarding the Fund's Fiduciary Net Position in conformity with GAAP.

A significant responsibility of the staff is to ensure that the Fund has in place an adequate system of internal control. A system of internal control is defined as systematic measures instituted by an organization to achieve the following objectives:

1. Conduct its business in an efficient manner;
2. Safeguard its assets and resources;
3. Deter and detect errors, fraud, and theft;
4. Ensure accuracy and completeness of its accounting data;
5. Produce reliable and timely financial and management information; and
6. Promote adherence to management's policies and procedures.

These controls include design of business systems, appropriate segregation of duties and responsibilities, sound practices, and capable personnel. There are limits to internal control, such as the cost to mitigate some risks may outweigh the risk itself, internal controls may be overridden, or collusion may foil control design. I believe the Fund's internal controls are adequate and are working as designed.

Financial Information

An overview of the fiscal operations of the Fund is presented in the Management's Discussion and Analysis (MD&A) preceding the financial statements in the Financial Section. It provides a narrative introduction, overview, and analysis of the basic financial statements. The MD&A compliments this letter of transmittal and should be read in conjunction with it.

Fund Overview

The Fund is a multiple employer agent defined benefit pension plan. The Fund covers employees of the City of Fort Worth (City Plan) and the employees of the Fund (Staff Plan). The City Plan was established by City Ordinance in 1945 and the Staff Plan was established through Administrative Rules in 2007. The Fund provides retirement, disability, and death benefits to its members. All employees of the City of Fort Worth and the Fund are members except elected officers and non-salaried appointed members of administrative boards and commissions, part-time, temporary and contract employees, and employees paid in part by another governmental agency. The two plans are comingled for investment purposes and are both administered by the 13-member Retirement Fund Board of Trustees. Each plan has a separate actuarial valuation completed each year and its own funded status based on current and projected assets and liabilities.

The Retirement Fund Board of Trustees (the Board) is comprised of four active members of the Fund, three retired members of the Fund, and six trustees appointed by the City Council of Fort Worth, Texas. All Board members serve a two-year term commencing on September 1st; there are no term limits. The Board selects a chairperson and a vice-chairperson annually, in September.

Investments

The Fund's overall objective is to achieve the highest level of investment performance that is compatible with its risk tolerance and prudent investment practices. Due to the long-term nature of the Fund's pension liabilities, the Trustees maintain a long-term perspective in formulating and implementing the Fund's investment policies, and in evaluating its investment performance. Based on general beliefs about long-term investment returns available from a well-diversified portfolio, the Board adopted the following investment objectives:

- Within the framework of prudent risk limitations, the minimum investment objective is to achieve an average long-term rate which satisfies the actuarial assumed rate of return. The annual actuarial rate of return is set at 7.0%.
- The Fund shall also strive to achieve investment performance that exceeds the rate of inflation over time, thereby providing a real rate of return.
- The Fund's assets earn a sufficient total rate of return over time to meet all benefit and expense obligations.

Market Environment

Fiscal year 2019 saw the US economy expanding for the 10th year, the longest economic expansion in history. This expansion was in the face of central bank shifting policies, geopolitical concerns, trade tensions driving market sentiment, heightened volatility in global equity markets, and strong performance in the bond markets.

Risk assets sold off in the first quarter of fiscal year 2019. While growth expectations had been lowered across regions, the Federal Reserve Bank raised US interest rates by 25 basis points at its December meeting. Concerns over slowing global growth, rising interest rates and tighter liquidity drove US equities down 13.52% for the quarter as measured by S&P 500. International equities and emerging markets fared better than the US equities, which were down 12.54% and 7.47% as measured by the MSCI EAFE and MSCI EM indexes respectively. The second quarter of fiscal year 2019, on the other hand, was a sharp contrast to the first quarter with all major asset classes posting positive returns. Driven by a more accommodative stance by the Federal Open Market Committee, progress on trade talks with China, and better-than-expected earnings, global equity markets rebounded with US equities returning 13.6%, international equities 10% and emerging market equites returning 9.9%. Fixed income led by US high yield generated strong returns for the quarter. The Bloomberg US Aggregate Bond index, a measure of fixed income performance, returned 2.9% for the quarter. Equity market volatility persisted throughout the rest of fiscal year 2019 as the US-China trade war intensified and concerns over slowing global economic growth drove market sentiment. The Federal Reserve Open Market Committee responded by delivering accommodative monetary policy reducing interest rates by 25 basis points in July and September 2019. Additionally central banks around the globe responded to low growth expectations with accommodative policies of their own. As interest rates fell, bond markets delivered strong returns for the fiscal year with the Bloomberg US Aggregate Bond index up 10.30%.

The Fund's domestic equity allocation which is comprised of primarily small cap and mid cap equities returned -4.54% for fiscal year 2019, outperforming the Russell 2000 benchmark which returned -8.89%. The Fund's international equity allocation encompassing both developed international equities as well as emerging market equities was slightly negative at -0.43%, outperforming its benchmark by 80 basis points. The global equity allocation which is made up of two passive global equity strategies delivered -0.86% while its benchmark MSCI ACWI returned 0.48%. The real return allocation, comprised of master limited partnerships, a broad tactical allocator, and a newly added real assets income strategy returned 0.82%, underperforming the benchmark by 99 basis points. The global fixed income allocation delivered a strong absolute return of 9.2%, although it underperformed the Bloomberg Barclays Global Aggregate benchmark by 110 basis points. Alternatives, including real estate, private equity, and absolute return mandates, generated positive return of 5.12%. Private equity investments had another strong performance delivering 13.70% while absolute return strategies detracted from the portfolio returning -2.39%. The Fund's total annualized performance was 3.03%, net of fees, for fiscal year 2019. For the three-year, five-year, and ten-year periods, the Fund returned 7.16%, 5.71%, and 7.09%, respectively. Since the Fund began running a diversified portfolio in September 1983, the annualized return has been 8.47%.

Actuarial Funding Status

Pursuant to the provisions of the Fund, the Board engages an independent actuarial firm to perform annual actuarial valuations. The Fund's funding objective is to ensure contributions, when combined with present assets and future investment returns, will be sufficient to meet the financial obligations to present and future retirees and beneficiaries.

Annual actuarial valuations measure the progress toward these goals, as well as the adequacy of the contribution rate. The Fund's actuary assumes that the Fund's investments will return 7.0% over the long-term. The differences between the assumed and the actual investment return are phased in (smoothed) over five years yielding an actuarial value of assets.

The Actuarial Value of Assets (AVA), Actuarial Accrued Liability (AAL), and the Funded Ratio of the City and Staff Plans, based on the actuarial valuation, as of December 31, 2018, are as follows:

AVA, AAL and Funded Ratio
December 31, 2018

Plan Name	Assets (AVA)	Liabilities (AAL)	Funded (Ratio)
City	$ 2,324,698,216	$ 4,438,326,161	52.4%
Staff	$ 5,189,502	$ 7,531,496	68.9%

A schedule of Funding Progress is included in the actuarial section. The funded status of the Fund is reviewed annually. Experience studies are conducted every three to five years with the most recent being completed December 31, 2018. The Fund is scheduled to have another three-year experience study conducted through December 31, 2021.

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 Fund for its CAFR for the fiscal year ended September 30, 2018. This was the ninth year that the Fund has earned this prestigious award. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized CAFR. This report must satisfy both generally accepted accounting principles and applicable legal requirements.

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

Public Pension Standards Award

For 2019, the Fund earned the Public Pension Coordinating Council Recognition Award for Administration. This is the fifth year that the Fund has received this award. This award is in recognition of meeting professional standards for plan administration as set forth by the Council. The standards serve as a benchmark by which to measure public defined benefit plans.

Acknowledgments

The preparation of the CAFR in a timely manner is made possible by the dedicated teamwork of the Fund's staff, under the leadership, dedication, and support of the Board. I am sincerely grateful to the Board and staff, as well as to all of our professional service providers, who perform so diligently to ensure the successful operation and financial soundness of the Fund.

Respectfully submitted,

Benita Falls Harper,

Executive Director

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 Fort Worth Employees' Retirement Fund for its CAFR for the fiscal year ended September 30, 2018.

Public Pension Coordinating Council

Recognition Award for Administration
2019

Presented to

Fort Worth Employees' Retirement Fund

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

Presented by the Public Pension Coordinating Council, a confederation of

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

Alan H. Winkle
Program Administrator

Board of Trustees

As of September 30, 2019

Todd Cox,
Board Chair
Active Employee
Fire Department
Elected to Place 2

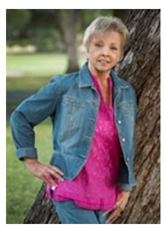
Rick Van Houten,
Board Vice Chair
Active Employee
Police Department
Elected to Place 1

Loraine Coleman
Active Employee
General Employees
Group C
Elected to Place 3

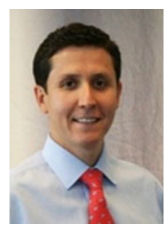
Andrea Wright
Active Employee
General Employees
Group D
Elected to Place 4

Tom Lewis
Retired Employee
Fire Department
Elected to Place 5

Kevin Foster
Retired Employee
Police Department
Elected to Place 6



Marsha Anderson
Retired Employee
General Employees
Elected to Place 7



Jesús Payán
Appointed Trustee
Place 8

Jarod Cox
Appointed Trustee
Place 9

Steve Litke
Appointed Trustee
Place 10

Bryan Barrett
Appointed Trustee
Place 11

Jim Lacamp
Appointed Trustee
Place 12

Reginald Zeno
CFO,
City of Fort Worth
Standing Seat
Place 13

Administrative Organization

Benita Falls Harper
Executive Director

Annette Connor
Executive/Legal Assistant

Robert Hulme
Deputy Director –
Investments & Operations

Christina Wu
Investment Officer

Branden George
Investment Analyst

Charles Henry
IT Systems Administrator

Rebecca Earley
Operations Assistant

Karen Epp
Senior Accountant

Christian Wetshi
Accountant

Trisha Thomason
Director of Member Services

Carla Perez
Member Services Specialist

Eleza Abdul
Member Services Specialist

Mary Braddock
Member Services Specialist

Victoria Valles-Miller
Member Services Assistant

Mary Beth Lane
Pension Administration System Analyst

Tracie Middleton
Communications Specialist

Desiree Trevino
Administrative Assistant

Professional Service Providers

Actuary
Gabriel Roeder Smith & Company

Auditors
Eide Bailly, LLP

Custodian
Northern Trust

Legal Counsel
DLA Piper, LLP
Jackson Walker, LLP

Investment Consultants
Albourne Partners Ltd.
Alignium, LLC
Hamilton Lane
RVK, Inc.

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A complete list of Investment Management Fees can be found on page 47, Investment Managers on page 57, Investment Management Fees and Commissions by asset class on page 61, and the Schedule of Brokers' Commissions on pages 62-63.

City Plan Summary of Key Provisions

Membership

An employee becomes a member upon regular employment with the City and contributes to the Fund.

Definitions

Key Terms:

- Final Average Compensation (FAC): average annual earnings over the member's highest three or five calendar years of service.
- Credited Service: length of time employed by the City of Fort Worth and making contributions to the Fund or purchased service.
- Group I – General employees hired prior to July 1, 2011.
- Group II – General employees hired on or after July 1, 2011.
- Group III – Police Officers hired prior to January 1, 2013.
- Group IV – Police Officers hired on or after January 1, 2013.
- Group V – Firefighters hired prior to January 10, 2015.
- Group VI – Firefighters hired on or after January 10, 2015.

Contributions

Employer (City):

Prior to December 22, 2018:

- Contributes 19.74% for Group I General employees and Group V Firefighters on regular retirement eligible earnings, overtime, vacation sellback, and wellness.
- Contributes 19.74% for Group II General employees and Group VI Firefighters on regular retirement eligible earnings only.
- Contributes 20.46% for Group III Police employees on regular retirement eligible earnings, overtime, vacation sellback, and wellness.
- Contributes 20.46% for Group IV Police employees on regular retirement eligible earnings only.

On or after December 22, 2018:

- Contributes 24.24% for Group I General employees and Group V Firefighters on regular retirement eligible earnings, overtime, vacation sellback, and wellness.
- Contributes 24.24% for Group II General employees and Group VI Firefighters on regular retirement eligible earnings only.
- Contributes 24.96% for Group III Police employees on regular retirement eligible earnings, overtime, vacation sellback, and wellness.
- Contributes 24.96% for Group IV Police employees on regular retirement eligible earnings only.

Member (Regular City Employee):

Prior to July 19, 2019:

- A Group I General employee contributes 8.25% on regular retirement eligible earnings, vacation sellback, and wellness.
- A Group II General employee contributes 8.25% on regular retirement eligible earnings only.

- A Group III Police employee contributes 8.73% on regular retirement eligible earnings, vacation sellback, and wellness.
- A Group IV Police employee contributes 8.73% on regular retirement eligible earnings only.
- A Group V Firefighter contributes 8.25% on regular retirement eligible earnings, built-in overtime, vacation sellback, and wellness.
- A Group VI Firefighter contributes 8.25% on regular retirement eligible earnings and built-in overtime.

On or after July 19, 2019:

- A Group I General employee contributes 9.35% on regular retirement eligible earnings, vacation sellback, overtime, and wellness. In addition, for the length of time the employee has service prior to October 1, 2013, they contribute an additional 0.7% on the same earnings.
- A Group II General employee contributes 9.35% on regular retirement eligible earnings and overtime.
- A Group III Police employee contributes 10.53% on regular retirement eligible earnings, vacation sellback, overtime, and wellness.
- A Group IV Police employee contributes 10.53% on regular retirement eligible earnings and overtime.
- A Group V Firefighter contributes 10.05% on regular retirement eligible earnings, built-in overtime, regular overtime, vacation sellback, and wellness.
- A Group VI Firefighter contributes 10.05% on regular retirement eligible earnings, built-in overtime and regular overtime.

Vesting

Vesting occurs following five years of credited service.

Retirement Pension

<u>Eligibility:</u>

- Normal Retirement – A member's age and years of service equal 80 points. For Group II members, the minimum retirement age is 55.
- Attainment of age 65 with five or more years of service.
- Early Retirement – Groups I, III, IV, V, and VI may elect an early retirement and receive a reduced pension at age 50 with five or more years of service. For Group II members, the minimum retirement age is 55 for early retirement.
- Special Retirement – Groups III and IV members may retire after completing 25 years of service regardless of age or points.

<u>Benefit Calculation:</u>

- Groups I and III – Benefits are calculated using a multiplier of 3% of the high three FAC earnings multiplied by total credited years of service prior to October 1, 2013. From October 1, 2013 forward, benefits are calculated using a multiplier of 2.5% of the high five FAC multiplied by total credited years of service on or after October 1, 2013.
- Group V – Benefits are calculated using a multiplier of 3% of the high three FAC earnings multiplied by total credited years of service prior to January 10, 2015. From January 10, 2015 forward, benefits are calculated using a multiplier of 2.5% of the high five FAC multiplied by total credited years of service on or after January 10, 2015.

- Groups II, IV, and VI – Benefits are calculated using a multiplier of 2.5% of the high five FAC multiplied by total credited years of service.
- For members in Groups I, III, and V that were not hired or vested by October 23, 2007, the high three FAC is capped by using their fourth highest year and limiting each higher year to 12% above the preceding amount.

Payment Options:

- Under normal or special retirement, a member may elect to receive between 5% and 25% of the actuarial value of their retirement benefit in a lump sum and receive a reduced monthly pension benefit.

Deferred Retirement

A member who has attained the normal retirement date may elect to remain in active service with the City and defer retirement by participating in the Deferred Retirement Option Program (DROP).

- DROP allows a member to accrue a monthly amount in their DROP account equal to what they would have received if they had retired (Retirement Pension).
- The member will receive the balance of that account at actual separation from active City employment.
- If a member remains in DROP for more than 72 months, there will no longer be accruals made to their DROP account.

Disability Retirement Pension

When a member is injured on or off the job, they have the option to apply for the disability benefit. Disability benefits are subject to Board approval. For Disability, the multiplier used for Groups I and III on credited service prior to October 1, 2013 and Group V on credited service prior to January 10, 2015 is 2.75%, and on or after the respective dates the multiplier on credited service is 2.25%. For Groups II, IV, and VI, the multiplier is 2.25% on credited service. If the disability was in the line of duty, the years of service are projected to normal or special retirement.

Early Retirement Pension

A vested member may elect to retire early after meeting the age requirements (see Eligibility). The multiplier for Groups I and III prior to October 1, 2013 and Group V prior to January 15, 2015 is 2.75%. On or after the respective dates the multiplier is 2.25%. For Groups II, IV, and VI, the multiplier is 2.25%. There is a penalty of 5% per year for electing this option prior to normal retirement eligibility.

Vested Termination Pension

A member with at least five years of credited service (vested) who separates from service may choose to leave their contributions with the Fund and receive a vested termination pension benefit at a later date. Members who take a vested termination pension are not eligible to take an actuarial equivalent lump sum.

Death Benefits

Death before retirement:

- If a member dies in the line of duty, the surviving spouse will receive a monthly pension of 75% of the member's accrued pension benefit projected to normal retirement.
- If the death is not in the line of duty, but occurs after a member is vested, the surviving spouse will receive a monthly pension of 75% of the member's accrued unreduced pension based on actual years of credited service.
- If the death is not in the line of duty and occurs before the member is vested, the surviving spouse or designated beneficiary will receive a refund of the member's contributions plus interest.

Death after retirement:

- If a Group I, III, or V member dies after retiring, provided that member and the surviving spouse have been married for at least one year prior to member's retirement date, the surviving spouse will receive 75% of the member's current pension.
- A Group II, IV, or VI member does not have any automatic survivor benefits. They may elect to take an actuarially reduced pension at retirement to provide survivor benefits to a designated beneficiary.
- All members may elect to take an actuarially reduced pension to provide survivor benefits to a designated beneficiary, if they are unmarried at the time of retirement.

Cost of Living Adjustments (COLA)

Groups I and III for service prior to October 1, 2013 and Group V for service prior to January 10, 2015, who retire or enter DROP by January 1, 2021, by election have one of the following two options:

- Simple 2% COLA – An annual 2% fixed increase is awarded January 1st of every year. The 2% is calculated on the original base pension and will not change.
- Ad-Hoc COLA – The annual increase is awarded on January 1st and may vary each year from 0% to 4%. The COLA amount is based on the funding status of the plan and is compounded.

Groups I and III for service on or after October 1, 2013 and Group V on or after January 10, 2015 have the Simple 2% COLA, if they retire or enter DROP by January 1, 2021.

Groups I, III and V for service prior to July 19, 2019, who are not retired or enrolled in DROP on or before January 1, 2021 have a Variable COLA or 13th check subject to actuarial conditions and approval of the Fund Board of Trustees and City Council. There is no COLA for service after July 19, 2019.

Groups II, IV, and VI are not eligible for any COLA.

Staff Plan Summary of Key Provisions

Membership

An employee becomes a member upon regular employment with the Fort Worth Employees' Retirement Fund (the Fund) and contributes to the Fund.

Contributions

Employer and Member:

- The Fund contributes 15.74% of the employee's annual salary each year.
- Members shall contribute 8.25% of their annual salary each year.

Definitions

Key Terms:

- Final average salary: average annual salary over the member's highest three calendar years of service.
- Credited service: length of time employed by the Fort Worth Employees' Retirement Fund and making contributions to the Fund or purchased service.

Vesting

Vesting occurs following five years of credited service.

Retirement Pension

Eligibility:

- NORMAL RETIREMENT - A member's age and years of service equal 80 points.
- Attainment of age 65 with five or more years of service.
- EARLY RETIREMENT - Attainment of age 50 with five or more years of service may elect an early retirement and receive a reduced pension.

Benefit Calculation:

Benefits are calculated using a multiplier of 3% of the three-year highest average salary multiplied by total credited years of service.

Payment Options:

Under normal retirement, a member may elect to receive between 5% and 25% of the actuarial value of their retirement benefit in a lump sum and receive a reduced monthly pension benefit.

Deferred Retirement

A member who has attained the normal retirement date may elect to remain in active service with the Fund and defer retirement by participating in DROP.

- DROP allows a member to accrue a monthly amount in their DROP account equal to what they would have received if they had retired.
- The member will receive the balance of that account at actual separation from service date.
- If a member remains in DROP for more than 60 months, there will no longer be accruals made to their DROP account.

Disability Retirement Pension

When a member is injured on or off the job, they have the option to apply for the disability benefit. Disability benefits are subject to Board approval and use a 2.75% multiplier in the benefit calculation.

Early Retirement Pension

A vested member may elect to retire early after meeting the age requirements. Early retirement benefits are subject to Board approval. The multiplier is 2.75% and there is a penalty of 5% per year for electing this option prior to normal retirement eligibility.

Vested Termination Pension

A member with at least five years of credited service (vested) who separates from service may choose to leave their contributions with the Fund and receive a vested termination pension benefit at a later date. Members who take a vested termination pension are not eligible to take an actuarial equivalent lump sum.

Death Benefits

Death before retirement:

- If a member dies in the line of duty, the surviving spouse will receive a monthly pension of 75% of the member's accrued pension benefit projected to normal retirement.
- If the death is not in the line of duty, but occurs after a member is vested, the surviving spouse will receive a monthly pension of 75% of the member's accrued unreduced pension based on actual years of credited service.
- If the death is not in the line of duty and occurs before the member is vested, the surviving spouse or designated beneficiary will receive a refund of the member's contributions plus interest.

Death after retirement:

- If a member, who retired before October 1, 2019, dies after retiring, provided that member and the surviving spouse have been married for at least one year prior to member's retirement date, the surviving spouse will receive 75% of the member's current pension.
- If a member, who retired after October 1, 2019, dies after retiring, provided that member and the surviving spouse have been married for at least one year prior to member's retirement date, the surviving spouse will receive 50% of the member's current pension.
- A member who retires after October 1, 2019 may elect to take an actuarially reduced pension at retirement to increase the surviving spouse benefit.

Cost of Living Adjustments (COLA)

Upon retirement:

All active employees and new hires will receive the 1% COLA beginning at age 60. Members who retired prior to October 1, 2019 receive the 2% COLA unless they were terminated prior to February 24, 2016. Terminated Vested members prior to February 24, 2016 will receive the Ad-Hoc COLA.

- 2% COLA – An annual 2% fixed increase is awarded January 1st of every year. The 2% is calculated on the original base pension and will not change.
- 1% COLA – An annual 1% fixed increase is awarded January 1st of every year after the retired member reaches age 60. The 1% is calculated on the original base pension and will not change.
- AD-HOC COLA – The annual increase is awarded on January 1st and may vary each year from 0% to 4%. The COLA amount is based on the funding status of the plan and is compounded.

FINANCIAL SECTION

Independent Auditor's Report

To the Board of Trustees of the
Employees' Retirement Fund of the
City of Fort Worth, Texas

Report on the Financial Statements
We have audited the accompanying combined financial statements of the Employees' Retirement Fund of the City of Fort Worth, Texas (the Fund), which comprise the combined statements of fiduciary net position as of September 30, 2019 and 2018, and the related combined statements of changes in fiduciary net position, for the years then ended, and the related notes to the financial statements.

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

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

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

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

Opinions
In our opinion, the financial statements referred to above present fairly, in all material respects, the respective combined statements of the fiduciary net position of the Employees' Retirement Fund of the City of Fort Worth, Texas, as of September 30, 2019 and 2018, and the respective combined statements of changes in fiduciary net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis, schedule of changes in net pension liability (City and Staff), schedule of net pension liability, schedule of actuarially determined employer contributions and schedule of combined money-weighted investment returns (collectively the required supplementary information) on pages 3-6 and 38-44 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Information

Our audit was conducted for the purpose of forming an opinion on the combined financial statements that collectively comprise the Fund's basic financial statements as a whole. The introductory, investment, actuarial and statistical sections are presented for purposes of additional analysis and are not a required part of the combined financial statements.

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

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

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated December 19, 2019, on our consideration of the Fund's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Fund's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Fund's internal control over financial reporting and compliance.

Eide Bailly LLP

December 19, 2019
Boise, Idaho

Management's Discussion and Analysis (Unaudited)

The Board of Trustees (the Board) of the Employees' Retirement Fund of the City of Fort Worth, Texas (the Fund) is pleased to provide this overview and analysis of the financial performance and activities of the Fund for the fiscal years ended September 30, 2019 and 2018. We encourage readers to consider the information presented here in conjunction with the financial statements that follow.

Overview of Financial Statements

The Management's Discussion and Analysis is intended to serve as an introduction to the Fund's basic financial statements. The Fund's financial statements are composed of financial statements and notes to the financial statements. This report also contains required supplementary information and other supplementary information in addition to the basic financial statements.

Financial Statements

There are two basic financial statements presented within this annual report. The Combined Statements of Fiduciary Net Position as of September 30, 2019 and 2018 give a snapshot of the financial position of the Fund at a particular point in time. The Combined Statements of Changes in Fiduciary Net Position for the fiscal years ended September 30, 2019 and 2018 provide a view of the fiscal years' additions to and deductions from net position.

Notes to Financial Statements

The notes are an integral part of the basic financial statements and provide additional background information that is essential to gain a complete understanding of the data provided within the Fund's financial statements.

Required Supplementary Information

The required supplementary information consists of the Schedule of Changes in Net Pension Liability – City Plan, Schedule of Changes in Net Pension Liability – Staff Plan, the Schedule of Net Pension Liability, the Schedule of Actuarially Determined Employer Contributions and Combined Schedule of Money-Weighted Investment Returns and Notes to Required Supplementary Information.

Other Supplementary Information

The other supplementary information consists of the Schedule of Administrative Expenses, the Schedule of Investment Management Fees, and the Schedule of Professional Fees.

Financial Highlights

The Fund's net position decreased by ($11,183,519) in fiscal 2019 compared to an increase of $54,454,640 in fiscal 2018 and an increase of $173,615,983 in fiscal 2017. The Fund's decreased net position is a result of benefit payments and contribution refunds exceeding contributions to the Fund. In 2019 benefit payments and refunds exceeded contributions by $73,321,453 compared to 2018 difference of $86,314,277 and a 2017 difference of $72,914,635. During fiscal year 2019, investment income totaled $67,899,773; in addition, benefits and refunds exceeded contributions, creating a negative change in net position. Investment income the previous two years exceeded the negative cash flow with investment income of $145,712,215 in 2018 and $251,413,019 in 2017. The following table shows a summary of the Fund's net position.

Combined Fiduciary Net Position
September 30, 2019, 2018 and 2017

	2019	2018	2017
Assets			
Cash	$ 129,406	$ 150,084	$ 173,456
Receivables from Securities Sold	210,963,804	289,108,874	268,132,810
Other Receivables and Prepaid Expenses	11,882,728	10,105,012	9,138,825
Investments	2,503,809,531	2,536,873,227	2,467,997,699
Capital Assets, Net	2,987,135	3,075,915	3,148,766
Total Assets	2,729,772,604	2,839,313,112	2,748,591,556
Liabilities			
Payables for Securities Purchased	281,455,382	373,833,069	340,776,458
Obligations Under Securities Lending	129,464,532	135,784,423	132,585,433
Other Liabilities	532,979	192,390	181,075
Total Liabilities	411,452,893	509,809,882	473,542,966
Net Position Restricted for Pensions	$ 2,318,319,711	$ 2,329,503,230	$ 2,275,048,590

Combined Changes in Fiduciary Net Position
For Fiscal Years Ended September 30, 2019, 2018, and 2017

	2019	2018	2017
Additions			
Contributions	$ 154,113,159	$ 131,503,493	$ 125,732,897
Investment Income (Loss), Net	67,899,773	145,712,215	251,413,019
Total Additions	222,012,932	277,215,708	377,145,916
Deductions			
Benefit Payments	221,699,004	212,542,816	194,768,534
Refund of Contributions	5,735,608	5,274,954	3,878,998
Administrative Expenses	5,639,269	4,835,882	4,767,202
Depreciation	122,570	107,416	115,199
Total Deductions	233,196,451	222,761,068	203,529,933
Change in Net Position	(11,183,519)	54,454,640	173,615,983
Fiduciary Net Position, Beginning of Year	2,329,503,230	2,275,048,590	2,101,432,607
Net Position Restricted for Pensions	$ 2,318,319,711	$ 2,329,503,230	$ 2,275,048,590

Financial Analysis

During fiscal year 2019, the Fund's investment portfolio returned 3.03% net of fees, compared to 6.46% for 2018 and 12.20% for 2017. The Fund's 2019 performance was a result of low to negative equity returns across various equity markets, and negative return from the Fund's absolute return investments, while the Fund had strong positive returns across fixed income and private equity while real estate and real return asset classes also contributed positive returns. The Fund's equity investments are allocated to domestic equity, which currently consists of small cap strategies, international equity and global equity. The fund's small cap allocation returned -4.54% in 2019 compared to the small cap benchmark Russell 2000 which returned -8.89%. The international equity portfolio returned -0.43 against the MSCI ACWI ex US index return of -1.23%. The Fund's global equity was also negative returning -0.86% vs the MSCI All Country World Index IMI which was slightly positive at 0.48%. The total equity returns for 2019 were -1.44%, compared to returns in 2018 and 2017 which were 7.20% and 20.10% respectively. Also negatively impacting returns were the Fund's absolute return investments which returned -2.39% compared to the Fund's custom benchmark which returned -0.06%. The returns for the Fund's absolute return strategies in 2018 were 5.77% compared to their benchmark of 3.05% and returned 8.96% in 2017 compared to the benchmark of 6.51%.

Positive investment returns were achieved during 2019 in the Fund's fixed income portfolio with a return of 9.20% compared to the Bloomberg US Aggregate Bond index up 10.30%. In 2018 the fixed income portfolio was down -0.86% and up 2.34% in 2017, the benchmark returned -1.22% and 0.07%. The Fund's best performing asset class was private equity with a 13.70% return. The Fund's private equity portfolio returned 13.06% in 2018 and 20.17% in 2017. Real estate was also a positive performer during the year returning 4.38%, compared to returns of 8.16% in 2018 and 7.07% in 2017. The Fund's real return portfolio had a return of 0.82% against its custom benchmark of 1.81%. The real return portfolio was up 3.67% during 2018 and up 3.58% in 2017, these compared to the custom benchmark of 4.97% and 3.63%, respectively.

The Fund's combined employer contributions were $113,351,227 in 2019 compared to $93,754,123 in 2018 and $89,645,358 in 2017. Employee contributions and purchased future service, net of refunded contributions were $35,026,324 compared to $32,474,416 in 2018 and $32,208,541 in 2017. Increased employer contributions were due to a 4.5% increase in the contribution rate starting January 1, 2019. Increased employee contributions were a result of increased payroll expenses for the employer.

Benefit payments increased by $9,156,188 in 2019 compared to an increase of $17,774,282 in 2018 and an increase of $12,727,603 in 2017. Benefits increased as a result of new retirees adding to the benefit payroll and from retirees receiving the 2% Cost of Living Adjustment (COLA).

Funding Progress

The actuarial reporting measurements as required by Governmental Accounting Standards Board Statement No. 67, *Financial Reporting for Pensions* – the total pension liability, net pension liability, and fund fiduciary net position as a percentage of the total pension liability. The census data used is as of December 31, 2018 and all other measurements are calculated as of the fiscal year end of the Fund, September 30, 2019. For the City Plan these measurements are as follows:

City Plan
Funding Progress
Fiscal Years Ending September 30
in billions

	Total Pension Liability	Fund Fiduciary Net Position	Net Pension Liability	Net Position as a Percent of Total Pension Liability
2019	$ 4.57	$ 2.31	$ 2.26	50.59%
2018	5.42	2.32	3.09	42.86%
2017	5.35	2.27	3.08	42.40%

The Staff Plan will also continue to be measured using an annual valuation performed at calendar year end as well as evaluated with GASB 67 required disclosures at statement of net position date. For the Staff Plan, these measurements are as follows:

Staff Plan
Funding Progress
Fiscal Years Ending September 30
in millions

	Total Pension Liability	Fund Fiduciary Net Position	Net Pension Liability	Net Position as a Percent of Total Pension Liability
2019	$ 8.04	$ 5.46	$ 2.58	67.88%
2018	6.65	5.17	1.48	77.73%
2017	5.70	4.53	1.17	77.71%

Requests for information: This financial report is designed to provide a general overview of the Fund's finances. Questions concerning any of the information provided should be addressed to the Employees' Retirement Fund of the City of Fort Worth, 3801 Hulen Street, Suite 101, Fort Worth, Texas 76107.

Combined Statements of Fiduciary Net Position

September 30, 2019 and 2018

	City Plan 2019	Staff Plan 2019	Combined Totals 2019	City Plan 2018	Staff Plan 2018	Combined Totals 2018
Assets						
Investments in Trust, at Fair Value						
Government Obligations	$ 136,419,427	$ 322,800	$ 136,742,227	$ 121,462,711	$ 270,584	$ 121,733,295
U.S.Treasuries	104,931,670	248,292	105,179,962	77,904,021	173,547	78,077,568
Short-term Marketable Securities	92,234,713	218,248	92,452,961	71,535,357	159,360	71,694,717
Corporate Obligations	201,853,367	477,631	202,330,998	164,626,094	366,739	164,992,833
Asset and Mortgage Backed Obligations	60,687,431	143,600	60,831,031	59,089,385	131,634	59,221,019
International Obligations	13,600,023	32,181	13,632,204	13,540,893	30,165	13,571,058
Corporate Stocks	386,835,955	915,342	387,751,297	436,588,141	973,696	437,561,837
Commingled Funds	804,870,934	1,904,507	806,775,441	848,883,210	1,889,959	850,773,169
Alternative Investments	567,306,501	1,342,377	568,648,878	602,121,956	1,341,352	603,463,308
Securities Lending Collateral	129,159,823	304,709	129,464,532	135,482,607	301,816	135,784,423
Total Investments	2,497,899,844	5,909,687	2,503,809,531	2,531,234,375	5,638,852	2,536,873,227
Receivables						
Employee Contributions	2,073,950	-	2,073,950	1,425,506	-	1,425,506
Employer Contributions	5,002,440	-	5,002,440	3,611,924	-	3,611,924
Other	14,648	-	14,648	1,049	-	1,049
Accrued Income	4,754,376	11,216	4,765,592	5,022,851	11,167	5,034,018
Due From Broker Securities Sold	210,467,277	496,527	210,963,804	288,467,529	641,345	289,108,874
Total Receivables	222,312,691	507,743	222,820,434	298,528,859	652,512	299,181,371
Prepaid Expenses	26,037	61	26,098	32,443	72	32,515
Cash	129,101	305	129,406	149,751	333	150,084
Capital Assets						
Building	3,501,766	8,261	3,510,027	3,498,048	7,777	3,505,825
Land	404,047	953	405,000	404,102	898	405,000
Furniture and Equipment	183,986	434	184,420	154,487	344	154,831
Software	137,741	325	138,066	137,760	306	138,066
Total Capital Assets	4,227,540	9,973	4,237,513	4,194,397	9,325	4,203,722
Accumulated Depreciation	(1,247,435)	(2,943)	(1,250,378)	(1,125,305)	(2,502)	(1,127,807)
Capital Assets, Net	2,980,105	7,030	2,987,135	3,069,092	6,823	3,075,915
Total Assets	2,723,347,778	6,424,826	2,729,772,604	2,833,014,520	6,298,592	2,839,313,112
Liabilities						
Due to Broker Securities Purchased	280,792,945	662,437	281,455,382	373,003,776	829,293	373,833,069
Other	531,725	1,254	532,979	191,963	427	192,390
Obligations Under Securities Lending	129,159,823	304,709	129,464,532	135,483,206	301,217	135,784,423
Total Liabilities	410,484,493	968,400	411,452,893	508,678,945	1,130,937	509,809,882
Net Position Restricted for Pensions	$ 2,312,863,285	$ 5,456,426	$ 2,318,319,711	$ 2,324,335,575	$ 5,167,655	$ 2,329,503,230

The Notes to Combined Financial Statements are an integral part of these statements.

Combined Statements of Changes in Fiduciary Net Position

For Fiscal Years Ended September 30, 2019 and 2018

	City Plan 2019	Staff Plan 2019	Combined Totals 2019	City Plan 2018	Staff Plan 2018	Combined Totals 2018
Investment Income						
Net Appreciation (Depreciation) in Fair Value	$ 26,319,057	$ 73,428	$ 26,392,485	$ 109,499,946	$ 227,452	$ 109,727,398
Interest and Dividend Income	29,755,901	69,451	29,825,352	27,387,385	58,155	27,445,540
Less: Investment Management Fees	(6,787,670)	(15,833)	(6,803,503)	(6,230,469)	(13,172)	(6,243,641)
Other Income	17,996,981	42,141	18,039,122	14,107,359	30,009	14,137,368
Investment Income Before Securities Lending	67,284,269	169,187	67,453,456	144,764,221	302,444	145,066,665
Securities Lending Activities						
Securities Lending Income	556,458	1,297	557,755	805,091	1,710	806,801
Securities Lending Expenses	(111,179)	(259)	(111,438)	(160,909)	(342)	(161,251)
Net Securities Lending Income	445,279	1,038	446,317	644,182	1,368	645,550
Total Net Investment Income	67,729,548	170,225	67,899,773	145,408,403	303,812	145,712,215
Contributions						
Employee Contributions	40,634,725	127,207	40,761,932	37,618,303	131,067	37,749,370
Employer Contributions	113,109,911	241,316	113,351,227	93,504,064	250,059	93,754,123
Total Contributions	153,744,636	368,523	154,113,159	131,122,367	381,126	131,503,493
Total Additions	221,474,184	538,748	222,012,932	276,530,770	684,938	277,215,708
Benefit Payments						
Retirement	171,687,119	55,314	171,742,433	160,170,170	1,780	160,171,950
Disability	5,261,167	-	5,261,167	5,285,218	-	5,285,218
Surviving Spouse	17,856,765	-	17,856,765	17,197,169	-	17,197,169
Children	42,619	-	42,619	34,289	-	34,289
Actuarial Equivalent	920,891	-	920,891	875,608	-	875,608
DROP Payouts	25,734,915	140,214	25,875,129	28,978,582	-	28,978,582
Total Benefit Payments	221,503,476	195,528	221,699,004	212,541,036	1,780	212,542,816
Other Payments						
Refunds/Terminations	5,735,608	-	5,735,608	5,260,660	14,294	5,274,954
Depreciation	122,282	288	122,570	107,178	238	107,416
Administrative	5,585,108	54,161	5,639,269	4,808,157	27,725	4,835,882
Total Other Payments	11,442,998	54,449	11,497,447	10,175,995	42,257	10,218,252
Total Deductions	232,946,474	249,977	233,196,451	222,717,031	44,037	222,761,068
Increase (Decrease) in Net Position	(11,472,290)	288,771	(11,183,519)	53,813,739	640,901	54,454,640
Net Position Restricted for Pensions, Beginning	2,324,335,575	5,167,655	2,329,503,230	2,270,521,836	4,526,754	2,275,048,590
Net Position Restricted for Pensions, Ending	$ 2,312,863,285	$ 5,456,426	$ 2,318,319,711	$ 2,324,335,575	$ 5,167,655	$ 2,329,503,230

The Notes to Combined Financial Statements are an integral part of these statements.

Notes to Combined Financial Statements

Note 1. Plan Description

The following description of the Employees' Retirement Fund of the City of Fort Worth, Texas (the Fund), is provided for general information purposes only. Participants (or members) should refer to the Plan Documents for more information.

General

The Fund is a multiple employer agent plan that covers employees of the City of Fort Worth (City Plan) and the employees of the Fort Worth Employees' Retirement Fund (Staff Plan). The Fund and City Plan were established by City Ordinance on September 12, 1945. The Staff Plan was established through Administrative Rules in 2007 and both plans are governed by State statute (Vernon's Civil Statutes, Title 109, Article 6243i) effective June 15, 2007. The City Plan is included in the Financial Statements of the City of Fort Worth.

The Fund provides retirement, disability and death benefits to its members and beneficiaries. All employees of the City of Fort Worth and the Retirement Fund Staff are members except elected officers and non-salaried appointed members of administrative boards and commissions, part-time, temporary and contract employees, and employees paid in part by another governmental agency. The two plans are commingled for investment purposes and are both administered by the 13-member Retirement Fund Board of Trustees. Each plan has a separate actuarial valuation completed each year.

The Retirement Fund Board of Trustees (the Board) is comprised of four active members of the Fund, three retired members of the Fund, and six trustees appointed by the Fort Worth City Council. All Board members serve a two-year term commencing on September 1st and annually select a chairperson and a vice-chairperson.

The Staff Plan was designed as a carve-out plan, with benefits identical to those of the General City employees (City of Fort Worth employees who are not civil service, police or fire) in August 2007 and continues with those benefits. Contribution rates were identical until fiscal year 2011, at which time the City Plan employer rates increased by 4%. This rate increase was not applied to the Staff Plan. At the time the Staff Plan was established in August of 2007, there were three Fund employees who were vested in the City Plan. At retirement, those employees will receive part of their retirement from the City Plan and the rest from the Staff Plan. Since the creation of the Staff Plan, other vested members of the City Plan have been hired by the Fund. These employees also will receive part of their retirement from the respective Plan in which they earned credit. The remaining Fund employees will receive any retirement benefits due to them from the Staff Plan only. The first actuarial valuation for the Staff Plan was completed as of January 1, 2008. Changes to the Staff Plan are determined by the Board.

The City has received a favorable letter of determination from the Internal Revenue Service (IRS) that its Plan is qualified under Section 401(a) of the Internal Revenue Code. The authority to define or amend employer and employee contribution rates or benefits is given to the Fort Worth City Council (the City Council). The City Plan is considered part of the City's financial reporting entity and is included in the City's basic financial statements as a pension trust fund. The City's payroll for employees covered by the City Plan for the years ended September 30, 2019 and 2018 was approximately $484 million and $467 million, and total payroll was approximately $491 million and $473 million, respectively.

Effective June 15, 2007, article 6243i of the Texas Revised Civil Statutes (Article 6243i) redefined the composition and structure of the Board, providing authority to the Board for benefit administration, asset investment and actuarial assumptions and authority to the Fund sponsor for benefit design and contribution percentage. Article 6243i also permitted the Board to create administrative rules that govern the administration of benefits of the Fund.

The Board may change the administrative operation of the Fund without the City's approval, while any increases to the benefit structure must be approved by the City, following an actuarial assessment. A reduction in benefits must be approved by the City, and the City must notify the Board 90 days in advance of such benefit reduction.

As of September 30, 2019 and 2018, the Fund's membership consisted of the following members:

Combined Plan Membership

	City Plan		Staff Plan	
Non-Active Members	**September 30, 2019**	**September 30, 2018**	**September 30, 2019**	**September 30, 2018**
Retirees currently receiving benefits	3,839	3,669	1	-
Beneficiaries currently receiving benefits	744	722	-	-
Terminated employees entitled to benefits but not yet receiving them	375	375	7	5
Terminated employees entitled to a refund	660	724	1	1
Total Non-Active Members	5,618	5,490	9	6
Active Members				
Vested	4,364	4,309	10	12
Nonvested	2,225	2,270	6	6
Total Active Members	6,589	6,579	16	18
Total Plan Membership	12,207	12,069	25	24

Vesting

Members vest in the Fund after five years of credited service. Vested members are eligible for normal retirement on the last day of the month in which the earlier of the following occurs: the member's age plus years of credited service equals 80 (Rule of 80), or the vested member reaches age 65. Members terminating employment prior to vesting are entitled to receive their contributions plus interest. Members who are vested have the option of receiving their contributions plus interest or leaving their contributions in the fund and receiving retirement benefits as described above.

Pension Benefits

In October of 2012 the City passed an ordinance change amending the benefits for new hire police civil service and split the benefits for existing police civil service and general employees, making changes similar to the November 2010 ordinance. Existing Police and General employees will have a different benefit calculation based on their hire date and dates of service. On September 16, 2014 and October 21, 2014, the City passed ordinance amendments making similar changes for new hire firefighters and existing firefighters, respectively, who previously had been unchanged. On December 11, 2018, the City passed an ordinance amending the benefits for all members. In February 2019 City employees voted in election to increase employee contributions.

The City Plan consists of six groups described generally as follows:

- Group I – A General Employee hired prior to July 1, 2011.
- Group II – A General Employee hired on or after July 1, 2011.
- Group III – A Police Officer hired prior to January 1, 2013.
- Group IV – A Police Officer hired on or after January 1, 2013.
- Group V – A Firefighter hired prior to January 10, 2015.
- Group VI – A Firefighter hired on or after January 10, 2015.

A member's normal retirement date is determined using the Rule of 80 or age 65 with at least 5 years of credited service. The City has adopted a 25-year-and-out program for police officers, which allows for full (unreduced) retirement after 25 years of service, regardless of age. Group II requires a minimum age of 55 at Rule of 80 to be eligible to retire. Each of the benefits are calculated by using an average annual compensation value multiplied by years of service and a multiplier percentage. The table below describes the variables for each group:

Group Number	Multiplier for Service prior to 10/01/2013	Multiplier for Service on or after 10/01/2013	Average Annual Compensation for service prior to 10/01/2013	Average Annual Compensation for service on or after 10/01/2013	Credited years of benefit service
Group I	3%	2.5%	Average of highest 3 (overtime included)	Average of highest 5 (overtime excluded)	Actual years and months of credited service
Group II	2.5%	2.5%	Average of highest 5 (overtime, wellness, vacation and sellback excluded)	Average of highest 5 (overtime, wellness, vacation and sellback excluded)	Actual years and months of credited service
Group III	3%	2.5%	Average of highest 3 (overtime included)	Average of highest 5 (overtime excluded)	Actual years and months of credited service
Group IV	2.5%	NA	Average of highest 5 (overtime, wellness, vacation and sellback excluded)	Average of highest 5 (overtime, wellness, vacation and sellback excluded)	Actual years and months of credited service

Group Number	Multiplier for Service prior to 01/10/2015	Multiplier for Service on or after 01/10/2015	Average Annual Compensation for service prior to 01/10/2015	Average Annual Compensation for service on or after 01/10/2015	Credited years of benefit service
Group V	3%	2.5%	Average of highest 3 (overtime included)	Average of highest 5 (overtime excluded)	Actual years and months of credited service
Group VI	NA	2.5%	Average of highest 5 (overtime, wellness, vacation and sellback excluded)	Average of highest 5 (overtime, wellness, vacation and sellback excluded)	Actual years and months of credited service

Cost of Living Adjustment (COLA)

Members of Groups I, III and V, as defined in the City ordinance, receive COLAs based on their selection of either simple 2% COLA or the ad-hoc COLA for service prior to either October 1, 2013 or January 10, 2015, depending on the group, provided they are retired or enrolled in DROP on or before January 1, 2021. [For members of Groups I, III and V] Service on or after October 1, 2013 or January 10, 2015, depending on the group, receives a simple 2% COLA, if retired or enrolled in DROP on or before January 1, 2021. Ad-hoc COLAs are compound and granted if the amortization period required to pay-off the unfunded liability is 28.0 years or less. If the amortization period falls between 24.1 - 28.0 years to pay off the unfunded liability the member will receive a 2% COLA, if the amortization period falls between 18.1 - 24.0 years the COLA is 3% and an amortization period below 18 years pays a 4% COLA. Members who are eligible to receive a COLA, are granted that COLA on January 1 of that year. The member must be retired by September 30 of the preceding year (or in DROP) in order to be eligible. For members of Groups I, III and V who are not retired or enrolled in DROP on or before January 1, 2021, there is a Variable COLA or 13th check that applies to service prior to July 19, 2019 which is subject to actuarial conditions and approval by the Fund Board of Trustees and City Council. Groups II, IV and VI are not eligible for a COLA. There is no COLA for service after July 19, 2019 for any Group.

Deferred Retirement Option Program

If a member continues to work after the normal retirement date, the member is required to make contributions to the Fund until the date of actual retirement. Members continue to accrue credited service until they retire unless they are enrolled in the Deferred Retirement Option Program (DROP). A member who has attained the normal or special retirement date may elect to remain in active service with the City and defer retirement by participating in the DROP. The DROP allows a member to accrue a monthly amount, into a notional account that does not earn interest, equal to what they would have received if they had retired. Retirement benefits are calculated at the DROP entry date and service and compensation beyond that date do not accrue to the benefit calculation but contributions on wages continue. The DROP account is payable when service ends and the only changes to the benefit upon the DROP exit are credit for unused applicable leave and eligible COLA increases. DROP is limited to 72 months.

In September 2007, the Board voted to allow members that have entered the DROP to leave a part or all of their DROP balance with the Fund. Members that elect this option are credited the same earnings as the Fund on a monthly basis and are subject to losses if the Plan incurs negative earnings on Fund assets.

DROP balances for all active and inactive City Plan participants totaled $119.1 million for fiscal year end 2019 and $118.9 million for fiscal year end 2018.

DROP balances for all active and inactive Staff Plan participants totaled zero for fiscal year end 2019 and $141,900 for fiscal year end 2018.

Cash Balance

General City employees hired after July 1, 2011 will not have overtime in their high five salary calculation. Alternatively, their contributions from overtime are placed in a cash balance account and the City pays 100% matching dollars plus interest at retirement. However, as of October 1, 2013, the cash balance plan is closed and no new contributions will be added to existing account balances.

Death and Disability Benefits

Upon the death of a retired member in Group I, III or V, the surviving spouse shall receive a monthly pension equal to 75% of the amount being paid to the retired member. If a vested member dies before retirement, the surviving spouse shall receive a monthly pension equal to 75% of the member's accrued pension, subject to certain minimum benefits. Active employees who become totally disabled while in the line of duty receive annual disability benefits that are equal to normal retirement benefits that would have accrued had the member worked to their normal retirement date. Members who become totally disabled while not in the line of duty receive disability benefits that are equal to retirement benefits that have accumulated as of the time they become disabled, provided the member was vested. Non-vested members who become totally disabled while not in the line of duty receive a refund of contributions, plus interest.

Groups II, IV, VI and unmarried members of any group have no joint survivorship benefit, they only have the designated beneficiary actuarially neutral option. Any member may elect to have a designated beneficiary survivor benefit at 25%, 50%, 75% or 100% by reducing their current benefit, making the cost to the plan actuarially neutral.

Obligation to Contribute to the Fund

Effective the first payroll of fiscal year 2011, the City shall contribute to the Fund an amount equal to 19.74% (20.46% for sworn police officers) of the salaries of members. Effective the first payroll of calendar year 2019, the City shall contribute to the Fund an amount equal to 24.24% (24.96% for sworn police officers) of the salaries of members. The City Council, through its budget appropriation, has the right to contribute an additional amount over and above the members' contributions.

Prior to July 19, 2019, employees of the City, as a condition of employment, commencing on the effective date of their membership in the Fund, shall contribute 8.25% (8.73% for sworn police officers) of their salary to the Fund until the date of their actual retirement or earlier termination of employment. After July 19, 2019, employees of the City, shall contribute 9.35% for General Employees, 10.05% for sworn fire fighters and 10.53% for sworn police officers of their salary to the Fund. In addition, General employees with service prior to October 1, 2013 pay an additional 0.7% of their salary to the Fund for the length of that service. The employer and employee contribution rates are not used when the actuary determines the annual required contributions to the Fund.

Note 2. Summary of Significant Accounting Policies

The following are the significant accounting policies followed by the Fund:

Basis of Accounting

The Fund's financial statements are prepared using the accrual basis of accounting in accordance with the standards of the Governmental Accounting Standards Board for pension trust funds. Employer and employee contributions are recognized when due, pursuant to formal commitments as well as statutory or contractual requirements. Benefits and refunds of the plan are recognized when due and payable in accordance with the terms of the plan. Purchases and sales of investments are recorded on a trade-date basis.

Cash and Cash Equivalents

For cash deposits and cash equivalents, the custodial credit risk is the risk that in the event of a bank failure, the Fund's deposits may not be returned. The Fund's deposits are held by Northern Trust and Frost Bank. As of September 30, 2019, and 2018, the Fund had bank balances of $129,406 and $150,084, respectively, that are in demand accounts subject to coverage by Federal Deposit Insurance Corporation (FDIC) but are not collateralized. The Fund does not have a deposit policy for custodial credit risk, however, management believes that the Fund's custodial credit risk exposure is mitigated by the financial strength of the banking institutions in which the deposits are held.

Property and Equipment

Property and equipment is reported on the cost basis. The Fund provides for depreciation on the straight-line method over the estimated useful lives of the assets.

The following estimated useful lives are used in providing for depreciation:

Building	40 years
Furniture and Equipment	5 – 7 years

Investment Policy Summary

The Board has adopted an Investment Policy Statement as a framework for the investment of the Fund's assets. The authority to amend that statement rests entirely with the Board. A copy of the Investment Policy Statement can be found in its entirety on the Fund's website.

Valuation of Investments

Investments are stated at fair value. When available, quoted market prices are used to value investments. Investments that do not have quoted market prices are priced from information received from the external manager. In these cases, external managers are independent investment managers that manage assets that are not held directly by the Fund. Examples of these kinds of investments are pooled real estate funds, pooled private equity investments and hedge funds. These assets are pooled and managed on behalf of a number of investors.

The underlying partnerships allow for withdrawals at various times during the year as provided for by the respective underlying agreements, which may include an initial lockup period, or be subject to a gate provision or suspension of redemptions.

The Fund utilizes a variety of financial instruments in their trading strategies, which contain varying degrees of off-balance sheet risk. However, due to the nature of the Fund's investments, such risks are limited to the Fund's capital balance in each underlying partnership. Below is a listing and description of the various investments used by the Fund:

- **Broad US Equity:** Equity securities listed on a recognized US securities exchange or quoted on the NASDAQ National Market System are priced at the regular trading session's closing price on the exchange or system in which such securities are principally traded. Securities not traded on the valuation date are priced at the most recent quoted bid price.
- **Broad International Equity:** Global securities' prices are based upon primary local market quotations. Depending upon local convention or regulation, the price may represent the last sale price or the mean between the last bid and ask price at the close of the appropriate exchange or at other designated times as determined by the appropriate governing body.
- **Fixed Income - Bank Loans:** Bank debt and syndicated loans that are traded in the secondary market will be priced using a pricing vendor quote, or if unavailable, a broker quote as directed by the client or delegate. Structured loans which are bi-lateral or multi-lateral agreements between the lender and the borrower will be priced at a level to be determined by the investment manager and approved by the Fund. Based on information available to the investment manager, the Fund will rely on the investment manager to indicate the current value of the loan/debt.
- **Fixed Income - Government/Corporate Bonds:** These securities are priced by a pricing vendor on the basis of bid or mid evaluations in accordance to a region's market convention, using factors which include but are not limited to market quotations, yields, maturities, and the bond's terms and conditions. The pricing vendors use proprietary methods to arrive at the evaluated price. These prices represent the price a dealer would pay for a security (typically in an institutional round lot).
- **Real Estate, Absolute Return, Private Equity, Real Return:** The Fund's investments in limited partnerships are valued at estimated fair value based on the Fund's proportionate share of the partnerships' fair value as recorded by the partnership. The Fund uses information provided by the limited partnership, such as audited financial statements, periodic information on the holdings and activities and periodic statements of fair value of the limited partnership and other information accumulated by management pertinent to the investment to estimate fair value. The limited partnerships allocate gains, losses and expenses to the partners based on the ownership percentage as described in the partnership agreements. Estimates are used by management in determining the fair value of the Fund's investments in limited partnerships. The amount received upon sale of the investments may differ significantly from the recorded amount.

There are certain market risks, credit risks, foreign exchange currency risks, or events that may subject the Fund's investment portfolio to economic changes occurring in certain industries, sectors, or geographies.

Net investment income includes net appreciation (depreciation) in the fair value of investments, interest income, dividend income, and investment expenses. Investment expense includes custodian and management fees, and all other significant investment-related costs.

Rate of Return

The Fund uses two approaches for calculating investment returns for reporting purposes. For the fiscal years ended September 30, 2019 and 2018, the annual money-weighted return on the Fund assets, net of investment expenses, was 2.92% and 6.50%, respectively. The money-weighted return expresses investment performance, net of investment expenses, adjusted for the changing amounts actually invested. In addition, for the fiscal years ended September 30, 2019 and 2018, the time-weighted return on Fund assets net of fees was 3.03% and 6.46%, respectively. The time-weighted rate of return is defined as the compounded growth rate of $1 over the period being measured and is not sensitive to contributions or withdrawals.

Interest and Dividends Receivable and Due to/from Broker

Interest income is recorded on an accrual basis. Dividends are recorded on the ex-dividend date. Recording activity in such a manner results in interest and dividends receivable. The balance due to broker securities purchased and due from broker securities sold represents trades pending settlement and amounts due to foreign currency contracts.

Foreign Currency Transactions

The Fund is a party to financial instruments with off balance sheet risk, primarily foreign currency forward contracts. Forward transactions are contracts or agreements for delayed delivery of commodities, securities, or money market instruments in which the seller agrees to make delivery at a specified future date of a specified commodity or instrument, at a specified price or yield. Entering into these investments involves not only the risk of dealing with counterparties and their ability to meet the terms of the contracts, but also the risk associated with market fluctuations.

Gains and losses resulting from foreign exchange contracts (transactions denominated in a currency other than the Fund's functional currency-US dollars) are recorded by the Fund based on changes in fair values and are combined with similar transactions in the accompanying combined statements of changes in fiduciary net position and are included in net investment income. The Fund structures its foreign exchange contracts and enters into certain transactions to substantially mitigate the Fund's exposure to fluctuations in foreign exchange rates.

Investment and broker accounts denominated in foreign currencies outstanding at September 30, 2019 and 2018 were converted to the Fund's functional currency at the foreign exchange rates quoted at September 30, 2019 and 2018. These foreign exchange gains and losses are included in net appreciation (depreciation) in fair value of investments in the accompanying combined statements of changes in fiduciary net position.

Use of Estimates

The preparation of financial statements and required supplementary information in accordance with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of net positions, and changes therein; the net pension liability at the date of the financial statements, and changes therein. Actual results could differ from those estimates.

The Plan invests in various investment securities. Investment securities are exposed to various risks, such as interest rate, market, and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such change could materially affect the amounts reported in the combined statement of fiduciary net position.

The net pension liability is reported based on certain assumptions pertaining to interest rates, inflation rates, and employee 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 would be material to the financial statements.

Expenses

The Fund staff is responsible for providing or contracting with vendors to provide all administrative functions necessary for operation of the Fund. The Board approves an annual budget for the administration of the Fund and these expenses are paid from current Fund assets.

Multiple Employer Agent Plan

The financial statements are prepared as a multiple employer agent plan. Assets are commingled for investment purposes. Financial statements are presented with combined information for each employer. Required supplemental information is also presented for each employer.

Note 3. Net Pension Liability

The net pension liability is measured using the total pension liability less the pension plan's fiduciary net position. The total pension liability as of September 30 is based on the results of the actuarial valuation dated December 31 and rolled forward using generally accepted actuarial procedures. The total pension liability for the City Plan is calculated using the long-term expected rate of return.

For the City Plan, the net position was projected to be available to make all projected future benefit payments of current plan members. The long-term expected rate of return on Retirement Fund investments, with adjustment to account for administrative expenses, was applied to the projected benefit payments. The following table reflects the Net Pension Liability for the City Plan:

Schedule of Net Pension Liability
Years Ended September 30

City Plan

Fiscal Year Ending 09/30	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a Percent of Total Pension Liability	Covered Payroll	Net Pension Liability as a Percent of Covered Payroll
2014	$ 3,610,674,395	$ 2,081,575,247	$ 1,529,099,148	57.65%	$ 391,216,461	390.86%
2015	4,127,343,024	2,003,269,563	2,124,073,461	48.54%	404,507,497	525.10%
2016	5,318,307,112	2,097,716,741	3,220,590,371	39.44%	424,371,512	758.91%
2017	5,354,699,800	2,270,521,836	3,084,177,964	42.40%	447,488,158	689.22%
2018	5,422,613,892	2,324,335,575	3,098,278,317	42.86%	467,754,197	662.37%
2019	4,571,921,160	2,312,863,285	2,259,057,875	50.59%	484,410,754	466.35%

For the Staff Plan, the net position was projected to be available to make all projected future benefit payments of current plan members. The long-term expected rate of return on Retirement Fund investments, with adjustment to account for administrative expenses, was applied to the projected benefit payments. The following table reflects the Net Pension Liability for the Staff Plan:

Schedule of Net Pension Liability
Years ended September 30

Staff Plan

Fiscal Year Ending 09/30	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a Percent of Total Pension Liability	Covered Payroll	Net Pension Liability as a Percent of Covered Payroll
2014	$ 4,156,464	$ 2,772,401	$ 1,384,063	66.70%	$ 1,432,884	96.59%
2015	4,130,487	3,088,220	1,042,267	74.77%	1,539,199	67.71%
2016	5,218,030	3,715,866	1,502,164	71.21%	1,587,554	94.62%
2017	5,697,981	4,526,754	1,171,227	79.44%	1,507,141	77.71%
2018	6,648,357	5,167,655	1,480,702	77.73%	1,588,685	93.20%
2019	8,038,352	5,456,426	2,581,926	67.88%	1,533,139	168.41%

Actuarial Methods and Assumptions

Actuarial valuations involve projections of benefit payments, contributions, and other amounts decades into the future. These projections are based on actuarial assumptions and methods adopted by the Fund's Board of Trustees. Assumptions such as salary increases, investment rates of return, retirement and disability rates, mortality, and inflation are compared against actual experience by actuarial experience studies conducted every three years. These studies assist the Fund's Board in evaluating the accuracy with which the assumptions predict actual experience. A three-year experience study was completed in the first quarter of 2019 for the period January 1, 2016 through December 31, 2018.

Schedule of Significant Actuarial Assumptions
As of December 31, 2018

	City Plan December 31, 2018	Staff Plan December 31, 2018
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Amortization Method	Level Percentage of Payroll, 30-year closed beginning in 2018	Leveled Dollar, Layered, Closed
Remaining Amortization Period	30 years	30 years
Asset Valuation Method	Five-year smoothed market	Five-year smoothed market
Inflation	2.50%	2.50%
Salary Increases	3.25% - 28.25%	2.75% - 5.35%
Investment Rate of Return	7.00%	7.00%
Retirement Age	Experience-based table of rates based on job classification and number of years since first retirement eligibility.	Experience-based table of rates based on job classification and number of years since first retirement eligibility.
Mortality	PubG-2010 Healthy Retiree Mortality Table for General Employees and PubS-2010 Healthy Retiree Mortality Table for Police Officers and Firefighters. Generational mortality improvements from the year 2010 using the ultimate mortality improvements rates in the MP tables.	PubG-2010 Healthy Retiree Mortality Table. Generational mortality improvements from the year 2010 using the ultimate mortality improvements rates in the MP tables.
Cost-of-Living Adjustment	A 2% cost-of-living adjustment (COLA) is assumed for all members in the guaranteed COLA program, zero COLAs are assumed for members with a variable COLA. Timing of conditional Ad Hoc COLAs is based on an open group projection.	4.0% COLAs are assumed for members participating in the Ad-Hoc COLA program.

Schedule of Significant Actuarial Assumptions
As of December 31, 2017

	City Plan	Staff Plan
Evaluation Date	December 31, 2017	December 31, 2017
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Open	Level Percentage of Payroll, Open
Remaining Amortization Period	30 years	30 years
Asset Valuation Method	Five-year smoothed market	Five-year smoothed market
Inflation	2.75%	2.75%
Salary Increases	2.75% - 16.00%	3.0% - 4.0%
Investment Rate of Return	7.75%	7.75%
Retirement Age	Experience-based table of rates based on job classification and number of years since first retirement eligibility.	Experience-based table of rates based on job classification and number of years since first retirement eligibility.
Mortality	RP-2014 Healthy Annuitant Mortality Table set forward three years for males and females. Generational mortality improvements using Scale MP-2015 are projected from the year 2014.	RP-2014 Healthy Annuitant Mortality Table set forward three years for males and females. Generational mortality improvements using Scale MP-2015 are projected from the year 2014.
Cost-of-Living Adjustment	A 2% cost-of-living adjustment (COLA) is assumed for all members in the guaranteed COLA program, zero COLAs are assumed for members participating in the Ad-Hoc COLA program.	A 2.0% cost-of-living adjustment (COLA) is assumed for all members in the guaranteed COLA program, 4.0% COLAs are assumed for members participating in the Ad-Hoc COLA program.

Expected Return Arithmetic Basis

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of September 30, 2019 and 2018 are summarized in the following tables:

Target Asset Allocation and Arithmetic Real Rate of Return
As of September 30, 2019

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Global Equity	40.33%	5.58%
Fixed Income	18.78%	1.68%
Real Return	2.80%	4.41%
Real Estate	11.80%	4.62%
Absolute Return	15.39%	3.09%
Private Equity	9.90%	7.00%
Cash	1.00%	0.50%
Total	100.00%	

Target Asset Allocation and Arithmetic Real Rate of Return
As of September 30, 2018

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Global Equity	39.05%	5.41%
Fixed Income	18.78%	1.24%
Real Return	2.80%	4.82%
Real Estate	13.08%	5.14%
Absolute Return	15.39%	3.41%
Private Equity	9.90%	7.25%
Cash	1.00%	0.00%
Total	100.00%	

Sensitivity of Net Pension Liability

The following tables present the net pension liability of the City Plan and the Staff Plan using their respective discount rates in 2019 and 2018, plus or minus 1%.

The City Plan was calculated using the expected rate return of 7.00%, as well as what the City Plan's net pension liability would be if it were calculated using a discount rate that is one percentage-point lower 6.00% or one percentage-point higher 8.00% than the current rate. As detailed in Note 1 Plan Description, changes were made to the benefit and contribution structure of the City Plan. As a result of these changes the Fund is no longer required to use a blended rate as the City Plan is not projected to run out of money using the Fund's assumed rate of return.

Sensitivity of the Net Pension Liability to Changes in Discount Rate
September 30, 2019

City Plan	**1% Decrease 6.00%**	**Discount Rate 7.00%**	**1% Increase 8.00%**
Net Pension Liability	$ 2,833,950,926	$ 2,259,057,875	$ 1,783,480,750

The Staff Plan was calculated using the discount rate of 7.00%, as well as what the Staff Plan's net pension liability would be if it were calculated using a discount rate that is one-percentage point lower, 6.00%, or one-percentage point higher, 8.00%, than the current rate:

Sensitivity of the Net Pension Liability to Changes in Discount Rate
September 30, 2019

Staff Plan	**1% Decrease 6.00%**	**Current Discount Rate 7.00%**	**1% Increase 8.00%**
Net Pension Liability	$ 3,862,730	$ 2,581,926	$ 1,538,652

In 2018, the City Plan was calculated using a blended rate of 5.35%, as well as what the City Plan's net pension liability would be if it were calculated using a discount rate that is one percentage-point lower, 4.35%, or one percentage-point higher, 6.35%, than the current rate:

Sensitivity of the Net Pension Liability to Changes in Discount Rate
September 30, 2018

City Plan	**1% Decrease 4.35%**	**Discount Rate 5.35%**	**1% Increase 6.35%**
Net Pension Liability	$ 3,919,184,028	$ 3,098,278,317	$ 2,437,505,097

In 2018, the Staff Plan was calculated using the discount rate of 7.75%, as well as what the Staff Plan's net pension liability would be if it were calculated using a discount rate that is one-percentage point lower, 6.75%, or one-percentage point higher, 8.75%, than the current rate:

Sensitivity of the Net Pension Liability to Changes in Discount Rate
September 30, 2018

Staff Plan	**1% Decrease 6.75%**	**Current Discount Rate 7.75%**	**1% Increase 8.75%**
Net Pension Liability	$ 2,547,658	$ 1,480,702	$ 608,852

Note 4. Fair Value Measurement (GASB 72)

The Fund categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The three levels of the fair value hierarchy are 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 quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations in which all significant inputs are observable. Level 3 valuations are derived from valuation techniques in which significant inputs are unobservable.

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

Investments that use inputs that are of different levels are categorized based on the lowest level of input used to determine the fair value of the investment.

Equity investments that are classified as Level 1 are valued using prices quoted in active markets for those securities. Level 1 debt securities are US Treasuries. Commingled debt funds that are publicly traded are also included in Level 1.

Debt and derivative securities classified as Level 2 are valued using either a bid evaluation or a matrix pricing technique. Bid evaluations may include market quotations, yields, maturities, call features and ratings. Matrix pricing is used to value securities based on the securities relationship to benchmark quoted prices. These debt and derivative securities have non-proprietary information that was readily available to market participants, from independent sources, which are known to be actively involved in the market. Cash and cash equivalents are short term investments valued based on cost and accrued interest which approximates fair value. Equity securities classified as Level 2 are derived from associated traded security values or convertible securities valued similar to debt securities through a bid evaluation process.

Debt and derivative securities classified in Level 3 are valued similar to Level 2 securities but have limited bids, limited trade information, limited trade activity, pricing from multiple sources but differences in prices above an acceptable level or pricing provided by a single source. Equity securities classified as Level 3 have limited trade information. These securities are priced off last trade price or estimated off recent trades and corporate actions.

Assets listed in the Investments Measured at NAV (Net Asset Value) table are invested with managers in structures that the Fund receives values for shares held in the investment structure with the manager. The liquidity of these structures is listed in the table.

Equity Investments – This consists of two Commingled Global Equity Funds that are passive institutional investment funds that invest in global equities diversified across all sectors focused on large to mid-cap equities. One of the global equity funds is based on a cap weighted MSCI ACWI index and the second fund is based on an MSCI ACWI weighted toward fundamental aspects of companies within the index. There is also one active Commingled Emerging Market Equity Fund that is an institutional investment fund that invests in emerging market equities diversified across all sectors focused on large to mid-cap equities.

Absolute Return Funds – This category consists of several different styles of funds as well as different liquidity structures. When redeeming from these funds, there is typically a notice period ranging from one to three months' notice and funds can hold back a small portion of the assets until an annual audit is conducted. In some cases mangers designate particular investments as longer hold periods than the funds liquidity schedule, in these cases they side pocket the investment, and these assets are not available immediately upon redemption. Directional funds include investments in two funds that invest in a directional nature based on their views of markets, at times these funds may invest without a directional bias. The directional funds are the most liquid funds in the portfolio with 55% of the assets able to redeem on a monthly basis and 45% of the assets able to redeem on a quarterly basis. Equity Long/Short funds include investments in five funds with two of these funds currently in redemption consisting of less than 1% of assets in this category. Equity long/short funds maintain some level of market exposure by investing in US or global equities both long and short with the level of exposure varying over time. Two funds of this type, consisting of 60% of assets in this category allow a full redemption on a quarterly basis. The other significant fund of this type, consisting of 39% of assets in this category, allows quarterly liquidity receiving ¼ of assets each subsequent quarter. Event driven funds include investments in eight funds with three of those funds currently in redemption consisting of 1% of assets in this category. These funds seek to gain an advantage from pricing inefficiencies that may arise based on corporate actions or events which may change the nature of the underlying investment. The nature of event driven investments often restricts the liquidity of those investments. In this category 16% of the assets may only be redeemed in three-year intervals, while 16% may only be redeemed on an annual basis. The remaining 67% of assets may be redeemed quarterly receiving ¼ of assets each subsequent quarter. Multi-Strategy funds invest in multiple strategies in order to diversify risks and reduce volatility. The five Funds in this category have been redeemed with the remaining assets either audit holdback or side pocketed assets waiting for liquidation. Relative Value funds include investments in two funds in this category. Relative Value funds seek returns by identifying mispricing of related securities or financial instruments. One of the Relative Value funds allows full redemption on a quarterly basis while the other fund allows quarterly liquidity receiving ¼ of assets each subsequent quarter.

Alternative Assets – This category consists of limited partnership structures that invest in companies or real estate which allow for limited or no liquidity for the investor. Private Equity partnerships consists of funds that invest in buyouts, growth equity, venture capital, special situations, mezzanine and distressed debt. There are 84 partnerships in this category and these partnerships are typically structured with a life from 7-12 years and are considered illiquid. As investments are sold out of the partnerships, assets are returned to the investors. These funds fair value are determined using net asset values one quarter in arears and adjusted for cash flows of the most recent quarter. Real Estate - Core partnerships invest in highly leased lower leverage properties that provide consistent income to the investors. These funds allow quarterly liquidity to the investors. There are three partnerships in this category. Real Estate – Non-Core partnerships invest in properties that require some kind of development or improvements to improve the position of the property. There are 21 partnerships in this category and these partnerships are typically structured with a life from 7-12 years and are considered illiquid. As properties are sold out of the partnership, assets are returned to the investors. These funds fair value are determined using net asset values one quarter in arears and adjusted for cash flows of the most recent quarter.

Investments and Derivative Instruments Measured at Fair Value
September 30, 2019

	Fair Value	Level 1	Level 2	Level 3
Investments by Fair Value Level				
Short Term Securities	$ 221,917,493	$ 13,157,454	$ 208,757,594	$ 2,445
Debt Securities				
Collateralized Debt Obligations	45,968,167	-	38,617,199	7,350,968
Commercial Mortgage-Backed Securities	14,862,864	-	13,947,195	915,669
Corporates	200,151,139	-	200,149,630	1,509
Debt Other	82,154,350	79,974,491	2,179,859	-
Municipals	5,837,209	-	5,079,499	757,710
Non U.S. Government	13,632,204	-	11,843,676	1,788,528
U.S. Government Agencies	130,905,018	-	124,992,628	5,912,390
U.S. Treasuries	105,179,962	105,179,962	-	-
Total Debt Securities	598,690,913	185,154,453	396,809,686	16,726,774
Equity Securities				
Communication Services	12,994,200	12,994,200	-	-
Consumer Discretionary	37,337,848	37,337,848	-	-
Consumer Staples	18,365,264	18,365,264	-	-
Energy	38,319,635	38,319,635	-	-
Equity Other	13,793,087	13,793,087	-	-
Financials	50,469,639	50,469,639	-	-
Health Care	25,345,223	25,345,223	-	-
Industrials	64,295,916	64,295,904	-	12
Information Technology	39,249,032	39,249,032	-	-
Materials	16,033,486	16,033,486	-	-
Real Estate	16,991,341	16,991,341	-	-
Utilities	8,268,528	8,268,528	-	-
Total Equity Securities	341,463,199	341,463,187	-	12
Investments Measured at Net Asset Value				
Commingled Global Equity Fund	505,170,842			
Commingled Emerging Market Equity Fund	46,288,097			
Absolute Return	275,012,511			
Private Equity	293,636,368			
Real Estate - Core	109,980,652			
Real Estate	111,649,456			
Total Investments Measured at Net Asset Value	**1,341,737,926**			
Total Investments by Fair Value Level	**$ 2,503,809,531**	**$ 539,775,094**	**$ 605,567,280**	**$ 16,729,231**
Investment Derivative Instruments				
Swaps	$ (910,463)	$ -	$ (910,463)	$ -
Rights and Warrants	89,152	89,152	-	-
Options	(14,871)	(8,547)	(6,324)	-
FX Forwards	(181,501)	-	(181,501)	-
Total Investment Derivative Instruments	**$ (1,017,683)**	**$ 80,605**	**$ (1,098,288)**	**$ -**

Investments Measured at NAV
September 30, 2019

	Fair Value	Unfunded Commitments	Redemption Frequency (if Currently Eligible)	Redemption Notice Period
Investments Measured at Net Asset Value				
Equity Investments				
Commingled Global Equity Fund	$ 505,170,842	$ -	Daily	1 day
Commingled Emerging Market Equity Fund	46,288,097	-	Daily	1 day
Total Equity Investments	551,458,939	-		
Absolute Return				
Directional	45,241,884	-	Monthly, Quarterly	2-75 days
Equity Long/Short	52,540,617	-	Quarterly, Annually	45-60 days
Event Driven	120,162,873	-	Monthly, Quarterly,	45-90 days
Multi-Strategy	3,221,488	-	Annually, Bi-Annually	45-90 days
Relative Value	53,845,649	-	Quarterly	60-90 days
Total Absolute Return Investments	275,012,511	-		
Alternative Assets				
Private Equity	293,636,368	121,508,964	Not eligible	N/A
Real Estate - Core	109,980,652	-	Quarterly	60-90 days
Real Estate	111,649,456	101,891,818	Not eligible	N/A
Total Alternative Investments	515,266,476	223,400,782		
Total Investments Measured at Net Asset Value	**$ 1,341,737,926**	**$ 223,400,782**		

Investments and Derivative Instruments Measured at Fair Value
September 30, 2018

	Fair Value	Level 1	Level 2	Level 3
Investments by Fair Value Level				
Short Term Securities	$ 207,479,140	$ -	$ 205,485,684	$ 1,993,456
Debt Securities				
Collateralized Debt Obligations	46,406,223	-	34,558,053	11,848,170
Commercial Mortgage-Backed Securities	12,571,066	-	12,571,066	-
Corporates	161,091,824	-	161,088,874	2,950
Debt Other	114,682,422	110,781,413	3,901,009	-
Municipals	5,912,149	-	5,912,149	-
Non U.S. Government	13,279,937	-	13,279,937	-
U.S. Government Agencies	116,355,996	-	107,069,017	9,286,979
U.S. Treasuries	78,077,568	78,077,568	-	-
Total Debt Securities	548,377,185	188,858,981	338,380,105	21,138,099
Equity Securities				
Communication Services	12,980,461	12,980,461	-	-
Consumer Discretionary	42,637,551	42,637,551	-	-
Consumer Staples	20,219,744	20,219,744	-	-
Energy	59,780,410	59,780,410	-	-
Equity Other	12,072,403	12,072,403	-	-
Financials	47,519,335	47,519,335	-	-
Health Care	30,197,676	30,197,676	-	-
Industrials	58,091,421	58,091,409	-	12
Information Technology	42,128,115	42,128,115	-	-
Materials	21,683,522	21,683,522	-	-
Real Estate	43,593,002	43,593,002	-	-
Utilities	4,414,362	4,414,362	-	-
Total Equity Securities	395,318,002	395,317,990	-	12
Investments Measured at Net Asset Value				
Commingled Global Equity Fund	501,266,655			
Commingled Emerging Market Equity Fund	42,243,836			
Absolute Return	322,714,070			
Private Equity	280,749,239			
Real Estate - Core	110,879,772			
Real Estate	127,845,328			
Total Investments Measured at Net Asset Value	**1,385,698,900**			
Total Investments by Fair Value Level	**$ 2,536,873,227**	**$ 584,176,971**	**$ 543,865,789**	**$ 23,131,567**
Investment Derivative Instruments				
Swaps	$ 204,564	$ -	$ 204,564	$ -
Options	(5,078)	-	(5,078)	-
FX Forwards	1,592,432	-	1,592,432	-
Total Investment Derivative Instruments	**$ 1,791,918**	**$ -**	**$ 1,791,918**	**$ -**

Investments Measured at NAV
September 30, 2018

	Fair Value	Unfunded Commitments	Redemption Frequency (if Currently Eligible)	Redemption Notice Period
Investments Measured at Net Asset Value				
Equity Investments				
Commingled Global Equity Fund	$ 501,266,655	$ -	Daily	1 day
Commingled Emerging Market Equity Fund	42,243,836	-	Daily	1 day
Total Equity Investments	543,510,491	-		
Absolute Return				
Directional	71,064,786	-	Monthly, Quarterly	2-75 days
Equity Long/Short	71,176,668	-	Quarterly, Annually	45-60 days
Event Driven	119,577,135	-	Monthly, Quarterly,	45-90 days
Multi-Strategy	3,997,141	-	Annually, Bi-Annually	45-90 days
Relative Value	56,898,340	-	Quarterly	60-90 days
Total Absolute Return Investments	322,714,070	-		
Alternative Assets				
Private Equity	280,749,239	143,498,961	Not eligible	N/A
Real Estate - Core	110,879,772	-	Quarterly	60-90 days
Real Estate	127,845,328	71,824,766	Not eligible	N/A
Total Alternative Investments	519,474,339	215,323,727		
Total Investments Measured at Net Asset Value	**$ 1,385,698,900**	**$ 215,323,727**		

Note 5. Investments

Substantially all of the Fund's investments are held by its custodian. The Retirement Fund Board of Trustees authorizes various external managers to manage investments within certain policies as set forth by the Board. These policies mandate a diversified portfolio, which includes investments, either directly or in commingled accounts, in real estate, fixed income securities, and equity securities.

Governmental Accounting Standards Board Statement No. 40 "Deposit and Investment Risk Disclosures – an amendment to GASB Statement No. 3" (GASB 40), addresses common deposit and investment risks including custodial credit risk, credit risk, concentration of credit risk, interest rate risk, and foreign currency risk. Required disclosures related to these risks are presented below:

Custodial Credit Risk

Custodial credit risk is the risk that in the event of failure of the counterparty, the Fund would not be able to recover the value of its investments. The Fund does not have a formal policy for custodial credit risk. As of September 30, all investments are registered in the name of the Employees' Retirement Fund of the City of Fort Worth or in the name of the Fund's custodian, established through a master trust custodial agreement, with the exception of investments in alternative investments and commingled funds.

Credit Risk of Debt Securities

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The Fund's investment policy requires that fixed income securities have a weighted average of no less than investment grade, as rated by Moody's or Standard & Poor's (S&P). However, the policy does provide for high yield fixed income managers to invest in securities with S&P ratings between BB+ and CCC. The policy limits 25% of a manager's portfolio to be rated CCC or lower. Unrated securities should be limited to no more than 20% of a manager's portfolio.

GASB 40 does not require disclosure of US government obligations explicitly guaranteed. The table on the following page shows the Fund's investments as of September 30, 2019 and 2018.

Credit Risk Analysis
September 30, 2019 and 2018

Investment Type	S&P Rating	2019 Fair Value	2018 Fair Value
Asset and Mortgage Backed Obligations	AAA	$ 32,016,833	$ 31,805,940
Asset and Mortgage Backed Obligations	AA	3,495,951	5,202,159
Asset and Mortgage Backed Obligations	A	7,570,549	6,126,196
Asset and Mortgage Backed Obligations	BBB	3,231,147	1,533,040
Asset and Mortgage Backed Obligations	BB	1,335,897	1,309,004
Asset and Mortgage Backed Obligations	B	3,535,585	1,960,918
Asset and Mortgage Backed Obligations	CCC	1,692,975	1,405,943
Asset and Mortgage Backed Obligations	NR	7,952,094	9,877,819
Total Asset and Mortgage Backed Obligations		60,831,031	59,221,019
Corporate Obligations	AAA	2,480,750	3,718,853
Corporate Obligations	AA	5,874,541	9,680,641
Corporate Obligations	A	70,860,710	50,085,143
Corporate Obligations	BBB	75,267,996	52,442,106
Corporate Obligations	BB	24,492,283	18,317,194
Corporate Obligations	B	19,428,419	22,242,666
Corporate Obligations	CCC	2,271,577	4,821,246
Corporate Obligations	CC	90,850	293,292
Corporate Obligations	NR	1,563,872	3,391,692
Total Corporate Obligations		202,330,998	164,992,833
Government Agency Obligations	AAA	114,094,862	115,591,331
Government Agency Obligations	AA	17,375,513	3,101,472
Government Agency Obligations	A	2,811,619	2,165,282
Government Agency Obligations	NR	2,460,233	875,210
Total Government Agency Obligations		136,742,227	121,733,295
International Obligations	AAA	9,057,443	3,871,031
International Obligations	AA	1,586,001	1,632,655
International Obligations	A	304,969	292,037
International Obligations	BBB	-	1,389,736
International Obligations	BB	-	2,830,897
International Obligations	B	-	126,855
International Obligations	NR	2,683,791	3,427,847
Total International Obligations		13,632,204	13,571,058
Securities Lending Collateral	AAA	-	1,758,827
Securities Lending Collateral	AA	24,428,130	72,567,337
Securities Lending Collateral	A	77,988,277	60,894,673
Securities Lending Collateral	BBB	2,516,471	-
Securities Lending Collateral	NR	24,531,654	563,586
Total Securities Lending Collateral		129,464,532	135,784,423
Total Fixed Income Subject to Credit Risk		543,000,992	495,302,628
US Treasuries (no credit risk)		105,179,962	78,077,568
Short-term Marketable Securities		92,452,961	71,694,717
Corporate Stock		387,751,297	437,561,837
Alternative Investments		568,648,878	603,463,308
Commingled Funds		806,775,441	850,773,169
Total Fair Value of Investments		**$2,503,809,531**	**$2,536,873,227**

Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the Fund's investment in a single issuer. The Fund's investment policy addresses concentration limits on a manager basis. As of September 30, 2019, the Fund did not have any investments, where the underlying assets which were registered in the Fund's name totaled more than 5% of assets of the Fund.

Interest Rate Risk

Interest rate risk is the risk that changes in interest rates of debt investments will adversely affect the fair value of an investment. The Fund does not have a formal investment policy that limits investment maturities as a means of managing its exposure to fair value losses arising from changing interest rates. The maturities of investments subject to interest rate risk are as follows:

Interest Rate Risk
September 30, 2019

Investment Type	Less Than 1 Year	1-5 Years	6-10 Years	More Than 10 Years	Total Fair Value
Asset and Mortgage	$ 867,334	$ 11,968,221	$ 6,248,357	$ 41,747,118	$ 60,831,030
Corporate Obligations	5,931,556	126,968,130	52,003,506	17,427,807	202,330,999
Government Obligations	529,097	15,336,246	6,121,285	114,755,599	136,742,227
International Obligations	-	7,877,875	3,055,724	2,698,605	13,632,204
Securities Lending Collateral	129,464,532	-	-	-	129,464,532
Short-term Fixed Income	92,452,961	-	-	-	92,452,961
US Treasuries	-	31,245,132	11,165,155	62,769,675	105,179,962
Total	**$ 229,245,480**	**$ 193,395,604**	**$ 78,594,027**	**$ 239,398,804**	**$ 740,633,915**

Interest Rate Risk
September 30, 2018

Investment Type	Less Than 1 Year	1-5 Years	6-10 Years	More Than 10 Years	Total Fair Value
Asset and Mortgage	$ 568,459	$ 13,614,240	$ 7,120,203	$ 37,918,117	$ 59,221,019
Corporate Obligations	8,005,045	96,168,400	39,899,564	20,919,824	164,992,833
Government Obligations	917	2,198,013	1,129,254	118,405,111	121,733,295
International Obligations	126,855	3,330,605	5,996,946	4,116,652	13,571,058
Securities Lending Collateral	135,784,423	-	-	-	135,784,423
Short-term Fixed Income	71,694,717	-	-	-	71,694,717
US Treasuries	-	28,515,026	17,224,736	32,337,806	78,077,568
Total	**$ 216,180,416**	**$ 143,826,284**	**$ 71,370,703**	**$ 213,697,510**	**$ 645,074,913**

Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or deposit. The Fund has no formal investment policy with regard to foreign currency risk as it is considered an intrinsic risk associated with the investment strategy. The Fund's exposure to foreign currency risk at September 30, 2019 and 2018 is presented in the following table.

Foreign Currency Exposure

	September 30, 2019				September 30, 2018			
Currency	**Debt**	**Equity**	**Alternatives**	**Total**	**Debt**	**Equity**	**Alternatives**	**Total**
Argentine Peso	$ 6,274	$ -	$ -	$ 6,274	$ 383,701.00	$ -	$ -	$ 383,701
Australian Dollar	167,330	889,285	-	1,056,615	1,322,529	3,827,724	-	5,150,253
Brazilian Real	58,627	3,934,482		3,993,109	40,305	3,242,212	-	3,282,517
British Pound Sterling	(84,044)	13,739,541	4,508,275	18,163,772	(8,765)	11,057,977	6,780,307	17,829,519
Canadian Dollar	70,440	8,412,650	-	8,483,090	22,961	11,292,881	-	11,315,842
Czech Koruna	-	-	-	-	2,020,289	-	-	2,020,289
Chilean Peso	1,636,715	-	-	1,636,715	2,834,339	-	-	2,834,339
Danish Krone	-	844,125	-	844,125	(22,215)	1,056,002	-	1,033,787
Euro Currency Unit	1,663,249	40,836,751	48,618,224	91,118,224	143,434	46,577,606	49,350,839	96,071,879
HK Offshore Chinese Yuan Renminbi	(3,045,847)	-	-	(3,045,847)	102	-	-	102
Hong Kong Dollar	172	13,926,410	-	13,926,582	-	15,140,451	-	15,140,451
Indian Rupee	1,684,092	-	-	1,684,092	3,750,782	-	-	3,750,782
Indonesian Rupiah	-	546,546	-	546,546	2,485,462	403,957	-	2,889,419
Japanese Yen	7,956,655	28,121,217	-	36,077,872	1,282,464	32,154,435	-	33,436,899
Mexican New Peso	2,788,408	-	-	2,788,408	2,801		-	2,801
New Taiwan Dollar	10,395	6,359,844	-	6,370,239	-	6,950,418	-	6,950,418
New Zealand Dollar	270	-	-	270	285	-	-	285
Norwegian Krone	-	-	-	-	1,349,225	343,418	-	1,692,643
Peruvian Nuevo Sol	368,435	-	-	368,435	-	-	-	-
Philippine Peso	-	-	-	-	-	262,491	-	262,491
Polish Zloty	95	457,556	-	457,651	39,320	765,563	-	804,883
Russian Ruble	-	-	-	-	4,748,070	-	-	4,748,070
Singapore Dollar	46	-	-	46	344	409,906	-	410,250
South African Rand	627	-	-	627	2,886,330	-	-	2,886,330
South Korean Won	-	3,765,215	-	3,765,215	2,031,096	4,403,878	-	6,434,974
Swedish Krona	-	3,821,361	-	3,821,361	1,341,273	4,113,187	-	5,454,460
Swiss Franc	1,278	10,199,858	-	10,201,136	14,007	12,478,947	-	12,492,954
Thai Baht	2,928	-	-	2,928	2,769	-	-	2,769
Total	**$ 13,286,145**	**$ 135,854,841**	**$ 53,126,499**	**$ 202,267,485**	**$ 26,670,908**	**$ 154,481,053**	**$ 56,131,146**	**$ 237,283,107**

Foreign Currency Exchange Transactions

To manage the foreign currency exchange risks associated with foreign investments, the Fund enters into forward currency contracts. The Fund had net foreign currency contracts with fair value of approximately $(181,501) and $1,592,432 at September 30, 2019 and 2018, respectively, which contractually obligates the Fund to deliver currencies at a specified date. The Fund could be exposed to risk of loss if the counterparty is unable to meet the terms of a contract or if the value of currency changes unfavorably. At September 30, 2019 and 2018, the fair value of these contracts is included in due to/from broker.

Note 6. Derivative Financial Instruments

The Fund's investment managers are permitted to invest in derivatives subject to guidelines established by the Board. Derivatives are financial instruments that derive their value, usefulness, and marketability from an underlying instrument which represents direct ownership of an asset or an obligation of an issuer. The Fund's derivative positions are marked to market daily and managers may only trade with counterparties with a credit rating of A-/A3 as defined by Standard & Poor's (S&P) and Moody's respectively. Substitution and risk control are the only strategies permitted; speculation is strictly prohibited. Derivatives are carried as a receivable when the fair value is positive and as a payable when the fair value is negative on the Combined Statement of Fiduciary Net Position. Fair value is determined based on quoted market prices, if available, or based on differences in cash flows between the fixed and variable rates in each contract as of the measurement date. Gains and losses from derivatives are included in net investment income. The Fund was in possession of the following types of derivatives at September 30, 2019 and 2018:

Futures Contracts

A futures contract is a standardized contract between two parties to buy or sell a specified asset of standardized quantity and quality for a price agreed upon today with delivery and payment occurring at a specified future date, the delivery date. The contracts are negotiated at a futures exchange, which acts as an intermediary between the two parties and to minimize the risk of default by either party.

Forward Contracts

A forward contract represents an agreement to buy or sell an underlying asset at a specified date in the future at a specified price. Payment for the transaction is delayed until the settlement or expiration date. A forward contract is a non-standardized contract that is tailored to each specific transaction. Forward contracts are privately negotiated and are intended to be held until the settlement date. Currency forward contracts are used to control currency exposure and facilitate the settlement of international security purchase and sale transactions.

Options

Options represent or give buyers the right, but not the obligation, to buy (call) or sell (put) an asset at a preset price over a specified period. The option's price is usually a small percentage of the underlying asset's value. As a buyer of financial options, the Fund receives a premium at the outset of the agreement and bears the risk of an unfavorable change in the price of the financial instrument underlying the option. As a purchaser of financial options, the Fund pays a premium at the outset of the agreement and the counterparty bears the risk of an unfavorable change in the price of the financial instrument underlying the option.

Rights and Warrants

A right is a special type of option that has a short market life, usually existing for no more than a few weeks. Essentially, rights originate when corporations raise money by issuing new shares of common stock. From an investor's perspective, a right enables a stockholder to buy shares of the new issue at a specified price, over a specified, fairly short time period. Rights not executed by their expiration date cease to exist and become worthless. A warrant is a long-term option that gives the holder the right to buy a certain number of shares of stock in a certain company for a certain period of time. Like most options, warrants are found in the corporate sector of the market. Occasionally, warrants can be used to purchase preferred stock or even bonds, but common stock is the leading redemption vehicle. Warrants, like rights, cease to exist and become worthless if they are not executed by their expiration date.

Swap Agreements

A swap is an agreement between two or more parties to exchange a sequence of cash flows over a period of time in the future based on an underlying asset. No principal is exchanged at the beginning of the swap. The cash flows the counterparties exchange are tied to a "notional" amount. A swap agreement specifies the time period over which the periodic payments will be exchanged. The fair value represents the gains or losses as of the prior marking-to-market.

The Investment Derivatives schedule that follows reports the fair value and changes in fair value and notional amounts of derivatives outstanding as of September 30, 2019 and 2018.

Investment Derivatives
As of September 30, 2019 and 2018

		Fair Value		Changes in
Derivative Type	**Notional Value**	**2019**	**2018**	**Fair Value**
Investment derivatives				
Futures Contracts	$ 130,265,853	$ (8,547)	$ -	$ (8,547)
Forward Contracts	84,641,822	(181,501)	1,592,432	(1,773,933)
Swap Agreements	92,390,820	(910,463)	204,564	(1,115,027)
Options	1,800,000	(6,324)	(5,078)	(1,246)
Rights and Warrants	383,726	89,152	-	89,152
Totals	**$ 309,482,221**	**$ (1,017,683)**	**$ 1,791,918**	**$ (2,809,601)**

Investment Derivatives
As of September 30, 2018 and 2017

		Fair Value		Changes in
Derivative Type	**Notional Value**	**2018**	**2017**	**Fair Value**
Investment derivatives				
Futures Contracts	$ 140,899,523	$ -	$ 9,103	$ (9,103)
Forward Contracts	114,046,489	1,592,432	(679,080)	2,271,512
Swap Agreements	134,392,836	204,564	353,537	(148,973)
Options	2,000,000	(5,078)	-	(5,078)
Rights and Warrants	-	-	3,094	(3,094)
Totals	**$ 391,338,848**	**$ 1,791,918**	**$ (313,346)**	**$ 2,105,264**

Credit Risk

The Fund is exposed to credit risk on investment derivatives that are traded over the counter and reported in asset positions. Derivatives exposed to credit risk include currency forward contracts, rights and warrants, and swap agreements. To minimize credit risk exposure, the Fund's managers monitor the credit ratings of the counterparties. Should there be a counterparty failure, the Fund would be exposed to the loss of the fair value of derivatives that are in the asset positions and any collateral provided to the counterparty, net of the effect of applicable netting arrangements. Netting arrangements provide the Fund with a right of offset in the event of bankruptcy or default by the counterparty. Collateral provided by the counterparty reduces the Fund's credit risk exposure.

The following Credit Risk Analysis schedule discloses the counterparty credit ratings of the Fund's investment derivatives by type, as of September 30, 2019 and 2018. These amounts represent the maximum loss that would be recognized if all counterparties fail to perform as contracted, without respect to any collateral or other security or netting arrangement. The schedule displays the fair value of the investments by credit rating in increasing magnitude of risk. Investments are classified by S&P rating. If the investment does not have an S&P rating, the Moody's rating that corresponds to the S&P rating is used. As of September 30, 2019, and 2018, the Fund's credit risk to these investments is disclosed on the following table:

Investment Derivatives
Credit Risk Analysis
September 30, 2019

Derivative Type	**AA**	**A**	**BBB**	**Not Rated**	**Fair Value**
Futures Contracts	$ -	$ -	$ -	$ (8,547)	$ (8,547)
Forwards Contracts	-	(18,559)	-	(162,942)	(181,501)
Swap Agreements	-	38,966	-	(949,429)	(910,463)
Options	-	(6,324)	-	-	(6,324)
Rights and Warrants	-	-	-	89,152	89,152
Total	**$ -**	**$ 14,083**	**$ -**	**$ (1,031,766)**	**$ (1,017,683)**

Investment Derivatives
Credit Risk Analysis
September 30, 2018

Derivative Type	**AA**	**A**	**BBB**	**Not Rated**	**Fair Value**
Forwards Contracts	$ (1,082)	$ (23,696)	$ -	$ 1,617,210	$ 1,592,432
Swap Agreements	-	(37,836)	-	242,400	204,564
Options	-	-	-	(5,078)	(5,078)
Total	**$ (1,082)**	**$ (61,532)**	**$ -**	**$ 1,854,532**	**$ 1,791,918**

Interest Rate Risk

The interest rate risk is the risk that changes in market interest rates will adversely affect the fair value of an investment. Interest rate swaps are an example of an investment that has a fair value that is highly sensitive to interest rate changes. These investments, as of September 30, 2019 and 2018, are disclosed on the following table:

Investment Derivatives
Interest Rate Risk Analysis
September 30, 2019 and 2018

	2019		2018	
Derivative Type	**Total Notional Value**	**Total Fair Value**	**Total Notional Value**	**Total Fair Value**
Interest Rate Swaps	$ 87,390,820	$ (910,456)	$ 129,392,836	$ 238,190
Swaptions	5,000,000	(7)	5,000,000	(33,626)
Total	**$ 92,390,820**	**$ (910,463)**	**$ 134,392,836**	**$ 204,564**

Foreign Currency Risk

For those forward contracts and swap agreements that are securities issued by foreign countries and foreign businesses there is an exposure to foreign currency risk. Currency forward contracts represent foreign exchange contracts that are used to control currency exposure and facilitate the settlement of international security purchase and sale transactions. The net exposure column of the following schedule indicates the Fund's net foreign currency risk related to derivatives as of September 30, 2019 and 2018.

Investment Derivatives
Foreign Currency Risk Analysis
September 30, 2019 and 2018

	2019			2018		
Currency	**Forward Contracts**	**Swap Agreements**	**Net Exposure**	**Forward Contracts**	**Swap Agreements**	**Net Exposure**
Australian Dollar	$ (3,584)	$ -	$ (3,584)	$ (11,599)	$ -	$ (11,599)
Brazilian Real	-	-	-	1,036,861	(20,845)	1,016,016
British Pound Sterling	(39,968)	(264,264)	(304,232)	(2,489)	132,797	130,308
Canadian Dollar	(6,535)	-	(6,535)	5,360	44,130	49,490
Chilean Peso	(41,216)	-	(41,216)	52,453	-	52,453
Chinese Yuan	(17,450)	-	(17,450)	-	-	-
Colombian Peso	-	-	-	(19,801)	-	(19,801)
Czech Koruna	-	-	-	(35,494)	-	(35,494)
Danish Krone	-	-	-	52,334	-	52,334
Euro Currency Unit	131,088	5,907	136,995	64,447	(47,995)	16,452
Japanese Yen	(197,910)	(483,140)	(681,050)	370,403	(51,603)	318,800
Indian Rupee	10,129	-	10,129	(101,501)	-	(101,501)
Indonesian Rupiah	-	-	-	44,859	-	44,859
Mexican Peso	(50,093)	-	(50,093)	82,603	-	82,603
New Taiwan Dollar	-	-	-	-	-	-
New Zealand Dollar	-	-	-	-	-	-
Norwegian Krone	-	-	-	17,409	-	17,409
Russian Ruble	14,535	-	14,535	(3,749)	-	(3,749)
South African Rand	-	-	-	(1,906)	-	(1,906)
South Korean Won	-	-	-	14,217	-	14,217
Swiss Franc	19,503	-	19,503	-	-	-
Swedish Krona	-	-	-	28,025	-	28,025
Total	**$ (181,501)**	**$ (741,497)**	**$ (922,998)**	**$ 1,592,432**	**$ 56,484**	**$ 1,648,916**

All values shown in Note 6 are for the positions that the Fund holds directly. The Fund may also have an indirect exposure to derivatives via its commingled funds and its alternative investments. The Fund owns an interest in the commingled and alternative investment funds which in turn holds the actual positions. Indirect exposures via these types of investments are not shown here.

Note 7. Securities Lending

The Fund is authorized to contractually lend securities to borrowers in accordance with the policy established by the Board. The Fund is currently contracted with Northern Trust to establish, manage and administer a securities lending program. Northern Trust facilitates lending the Fund's domestic and international equity and fixed income securities in return for collateral consisting of cash, US government securities and irrevocable letters of credit issued by banks independent of the borrower. As of September 30, all securities lending collateral held is cash. At a loan's inception, the value of collateral is equal to 102% for securities of United States issuers, and 105% in the case of securities of non-United States issuers, of the fair value of any securities to be loaned, plus any accrued interest.

Cash collateral is to be invested in government securities, bank and corporate notes, bank certificates of deposit, time deposits, bankers' acceptances, repurchase agreements, commercial paper and asset backed securities. The contract with Northern Trust specifies guidelines for allowable investments, maturities, and diversification. The Fund does not have the ability to pledge or sell collateral securities without borrower default. The amount of cash collateral held exceeds the value of the assets on loan at September 30, 2019 and 2018.

The Fund earns income from fees paid by the borrowers and interest earned from investing the cash collateral. The contract requires the custodian bank to purchase any loaned securities with collateral provided, however, if the collateral is insufficient to cover the loss, the Fund is liable for the loss. The cash collateral received on each loan was invested in the collateral pool at Northern Trust. Because the loans are terminable at will, their duration generally did not match the duration of the investments made with cash collateral. In addition, the Plan had no credit risk exposure to borrowers. As of September 30, 2019 and 2018, the value of the cash collateral held was $129,464,532 and $135,784,423, respectively and the value of securities out on loan at September 30, 2019 and 2018, was $126,396,698 and $132,238,671, respectively. The Fund earned $446,317 and $645,550 net, on its securities lending activity for the fiscal years ended September 30, 2019 and 2018, respectively.

Note 8. Tax Status

The City Plan obtained its latest determination letter on December 8, 2014, in which the Internal Revenue Service (IRS) stated that the Fund, as then designed, was in compliance with the applicable requirements of the Internal Revenue Code (IRC). The Staff plan obtained its latest determination letter on April 7, 2017, in which the Internal Revenue Service (IRS) stated that the Fund, as then designed, was in compliance with the applicable requirements of the Internal Revenue Code (IRC).

No federal, state or local income taxes have been provided on the operations of the Fund since the IRS approved the Fund determination letter to be designed and operated in compliance with the applicable requirements of the IRC. Therefore, no provision for income taxes has been included in the Fund's financial statements.

The Fund evaluates tax positions taken or expected to be taken in the course of preparing the Fund's tax returns to determine whether the tax positions are "more-likely-than-not" of being sustained by the applicable tax authority. Tax positions deemed to meet a more-likely-than-not threshold should be recorded as a tax expense in the current year. The Board has analyzed the Fund's tax positions for all open tax years and has concluded that, as of September 30, 2019, no provision for income taxes is required in the financial statements.

As of and during the year ended September 30, 2019, the Fund did not have any liabilities for any unrecognized tax positions. The Fund recognizes interest and penalties, if any, related to unrecognized tax positions as tax expense in the statements of changes in fiduciary net position. During the year, the Fund did not incur any tax related interest or penalties.

Note 9. Plan Termination

City Plan

While the City has not expressed any intent to discontinue its contributions, it may terminate the City Plan at any time. In the event the City Plan terminates, the net position shall be allocated among the participants and beneficiaries of the City Plan as follows:

- First, benefits that former employees or their beneficiaries are receiving or that employees eligible for retirement would have been receiving had they retired
- Next, other vested benefits
- Finally, all other accrued benefits

If assets remain after the above allocations, they shall be distributed to the City.

Staff Plan

While the Board has not expressed any intent to discontinue its contributions, it may terminate the Staff Plan at any time. In the event the Staff Plan terminates, the net position shall be allocated among the participants and beneficiaries of the Staff Plan as follows:

- First, benefits that former employees or their beneficiaries are receiving or that employees eligible for retirement would have been receiving had they retired
- Next, other vested benefits
- Finally, all other accrued benefits

If assets remain after the above allocations, they shall be distributed to the Board.

Note 10. Subsequent Events

As of the issuance of this report, there are no subsequent events to report.

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability – City (Unaudited)

City Plan

	2014	2015	2016	2017	2018	2019
Total Pension Liability						
Service Cost	$ 92,189,100	$ 85,592,978	$ 98,173,277	$ 123,792,923	$ 113,947,000	$ 111,950,763
Interest	234,701,479	246,292,813	252,240,071	251,645,608	274,954,967	290,020,564
Benefit Changes	110,187,898	(1,828,408)	-	-	-	(1,543,331,519)
Difference Between Actual and Expected Experience	(106,951,077)	(10,817,086)	4,177,731	186,853,574	62,114,429	(18,487,311)
Assumption Changes	-	364,494,287	1,022,192,887	(327,287,818)	(165,300,608)	536,393,855
Benefit Payments and Refunds	(161,158,600)	(167,065,955)	(185,819,878)	(198,611,599)	(217,801,696)	(227,239,084)
Net Change in Total Pension Liability	168,968,800.00	516,668,629.00	1,190,964,088.00	36,392,688.00	67,914,092.00	(850,692,732)
Total Pension Liability - Beginning	3,441,705,595	3,610,674,395	4,127,343,024	5,318,307,112	5,354,699,800	5,422,613,892
Total Pension Liability - Ending	$ 3,610,674,395	$ 4,127,343,024	$ 5,318,307,112	$ 5,354,699,800	$ 5,422,613,892	$ 4,571,921,160
Plan Fiduciary Net Position						
Contributions - Member	$ 31,929,289	$ 32,541,773	$ 33,977,411	$ 35,963,200	$ 37,618,303	$ 40,634,725
Contributions - Employer	78,165,049	80,820,598	84,746,991	89,408,134	93,504,064	113,109,911
Net Investment Income	159,994,300	(20,635,550)	166,305,791	250,912,773	145,408,403	67,729,548
Benefit Payments and Refunds	(161,158,600)	(167,065,955)	(185,819,878)	(198,611,599)	(217,801,696)	(227,239,084)
Administrative Expense	(3,738,927)	(3,823,331)	(4,521,503)	(4,867,413)	(4,915,335)	(5,707,390)
Other	(130,935)	(143,220)	(241,634)	-	-	
Net Change in Plan Fiduciary Net Position	$ 105,060,176	$ (78,305,685)	$ 94,447,178	$ 172,805,095	$ 53,813,739	$ (11,472,290)
Plan Fiduciary Net Position - Beginning	$ 1,976,515,071	$ 2,081,575,247	$ 2,003,269,563	$ 2,097,716,741	$ 2,270,521,836	$ 2,324,335,575
Plan Fiduciary Net Position - Ending	2,081,575,247	2,003,269,563	2,097,716,741	2,270,521,836	2,324,335,575	2,312,863,285
Net Pension Liability Ending	**$ 1,529,099,148**	**$ 2,124,073,461**	**$ 3,220,590,371**	**$ 3,084,177,964**	**$ 3,098,278,317**	**$ 2,259,057,875**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	57.65%	48.54%	39.44%	42.40%	42.86%	50.59%
Covered Payroll	$ 391,216,461	$ 404,507,497	$ 424,371,512	$ 447,488,158	$ 467,754,197	$ 484,410,754
Net Pension Liability as a Percentage of Covered Payroll	390.86%	525.10%	758.91%	689.22%	662.37%	466.35%

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

See Notes to Required Supplementary Information

Schedule of Changes in Net Pension Liability – Staff (Unaudited)

Staff Plan
Years ended September 30,

	2014	2015	2016	2017	2018	2019
Total Pension Liability						
Service Cost	$ 286,870	$ 303,626	$ 284,929	$ 252,967	$ 274,978	$ 226,297
Interest	252,813	337,668	335,753	422,610	462,281	525,209
Benefit Changes	-	-	(786,759)	-	-	(588,078)
Difference Between Actual and Expected Experience	510,965	(650,524)	300,333	(159,693)	229,191	279,208
Assumption Changes	-	-	965,041	-	-	1,142,887
Benefit Payments and Refunds	-	(16,747)	(11,754)	(35,933)	(16,074)	(195,528)
Net Change in Total Pension Liability	1,050,648	(25,977)	1,087,543	479,951	950,376	1,389,995
Total Pension Liability - Beginning	3,105,816	4,156,464	4,130,487	5,218,030	5,697,981	6,648,357
Total Pension Liability - Ending	$ 4,156,464	$ 4,130,487	$ 5,218,030	$ 5,697,981	$ 6,648,357	$ 8,038,352
Plan Fiduciary Net Position						
Contributions - Member	$ 296,093	$ 126,984	$ 130,973	$ 124,339	$ 131,067	$ 241,316
Contributions - Employer	225,536	242,270	249,881	237,224	250,059	127,207
Net Investment Income	209,544	(30,772)	286,116	500,246	303,812	170,225
Benefit Payments and Refunds	-	(16,747)	(11,754)	(35,933)	(16,074)	(195,528)
Administrative Expense	(4,897)	(5,702)	(7,779)	(14,988)	(27,963)	(54,449)
Other	(172)	(214)	(19,791)	-	-	-
Net Change in Plan Fiduciary Net Position	$ 726,104	$ 315,819	$ 627,646	$ 810,888	$ 640,901	$ 288,771
Plan Fiduciary Net Position - Beginning	$ 2,046,297	$ 2,772,401	$ 3,088,220	$ 3,715,866	$ 4,526,754	$ 5,167,655
Plan Fiduciary Net Position - Ending	2,772,401	3,088,220	3,715,866	4,526,754	5,167,655	5,456,426
Net Pension Liability Ending	**$ 1,384,063**	**$ 1,042,267**	**$ 1,502,164**	**$ 1,171,227**	**$ 1,480,702**	**$ 2,581,926**
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	66.70%	74.77%	71.21%	79.44%	77.73%	67.88%
Covered Payroll	$ 1,432,884	$ 1,539,199	$ 1,587,554	$ 1,507,141	$ 1,588,685	$ 1,533,139
Net Pension Liability as a Percentage of Covered Payroll	96.59%	67.71%	94.62%	77.71%	93.20%	168.41%

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

See Notes to Required Supplementary Information

Schedule of Net Pension Liability (Unaudited)

Schedule of Net Pension Liability
Years ended September 30

City Plan

FY Ending 09/30	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a Percent of Total Pension Liability	Covered Payroll	Net Pension Liability as a Percent of Covered Payroll
2014	$ 3,610,674,395	$ 2,081,575,247	$ 1,529,099,148	57.65%	$ 391,216,461	390.86%
2015	4,127,343,024	2,003,269,563	2,124,073,461	48.54%	404,507,497	525.10%
2016	5,318,307,112	2,097,716,741	3,220,590,371	39.44%	424,371,512	758.91%
2017	5,354,699,800	2,270,521,836	3,084,177,964	42.40%	447,488,158	689.22%
2018	5,422,613,892	2,324,335,575	3,098,278,317	42.86%	467,754,197	662.37%
2019	4,571,921,160	2,312,863,285	2,259,057,875	50.59%	484,410,754	466.35%

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

Schedule of Net Pension Liability
Years ended September 30

Staff Plan

FY Ending 09/30	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a Percent of Total Pension Liability	Covered Payroll	Net Pension Liability as a Percent of Covered Payroll
2014	$ 4,156,464	$ 2,772,401	$ 1,384,063	66.70%	$ 1,432,884	96.59%
2015	4,130,487	3,088,220	1,042,267	74.77%	1,539,199	67.71%
2016	5,218,030	3,715,866	1,502,164	71.21%	1,587,554	94.62%
2017	5,697,981	4,526,754	1,171,227	79.44%	1,507,141	77.71%
2018	6,648,357	5,167,655	1,480,702	77.73%	1,588,685	93.20%
2019	8,038,352	5,456,426	2,581,926	67.88%	1,533,139	168.41%

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

See Notes to Required Supplementary Information

Schedule of Actuarially Determined Employer Contributions (Unaudited)

Years ended September 30

City Plan

Fiscal Year Ended September 30	Actuarially Determined Contributions	Contributions in Relation to Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Payroll	Percentage Contributed
2014	$ 82,937,890	$ 78,165,049	$ 4,772,841	$ 391,216,461	19.98%
2015	93,562,584	80,820,598	12,741,986	404,507,497	19.98%
2016	101,339,917	84,746,991	16,592,926	424,371,512	19.97%
2017	112,185,281	89,408,134	22,777,147	447,488,158	19.98%
2018	131,766,357	93,504,064	38,262,293	467,754,197	19.99%
2019	136,167,863	113,109,911	23,057,952	484,410,754	23.35%

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

Staff Plan

Fiscal Year Ended September 30	Actuarially Determined Contributions	Contributions in Relation to Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Payroll	Percentage Contributed
2014	$ 114,917	$ 225,536	$ (110,619)	$ 1,432,884	15.74%
2015	95,276	242,270	(146,994)	1,539,199	15.74%
2016	244,007	249,881	(5,874)	1,587,554	15.74%
2017	169,101	237,224	(68,123)	1,507,141	15.74%
2018	244,499	250,059	(5,560)	1,588,685	15.74%
2019	243,462	241,316	2,146	1,533,139	15.74%

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

See Notes to Required Supplementary Information

Schedule of Combined Money-Weighted Investment Returns (Unaudited)

Years Ended September 30

For Years Ended 9/30	Annual Investment Returns*
2019	2.92%
2018	6.50%
2017	12.15%
2016	8.43%
2015	-1.06%
2014	8.25%
2013	10.70%
2012	12.98%
2011	1.44%
2010	9.54%
2009	-2.62%
2008	-16.62%

* Annual money-weighted rate of return, net of investment fees and adjusted for the changing amounts actually invested. The City and Staff plans are commingled for investment purposes and both plans experience the same return.

See Notes to Required Supplementary Information

Notes to Required Supplementary Information

Methods and Assumptions Used in Calculations of Actuarially Determined Contributions

The actuarially determined contribution is equal to the total calculated contribution rate in the prior actuarial valuation, minus the portion expected to be covered by employee contributions, multiplied by the covered-employee payroll. City and member contribution rates are established by ordinance. Employer and member contribution rates for the staff plan are established in the administrative rules.

The assumptions and methods summarized below were adopted by the Board of Trustees on May 27, 2019 based on the experience investigation that covered the three-year period from January 1, 2016 through December 31, 2018. These assumptions first applied for actuarial valuation as of December 31, 2018 and the actuarially determined contribution for fiscal year ending September 30, 2020.

Fort Worth Employees' Retirement Fund
Notes to Required Supplementary Information
For Year Ended September 30, 2019

	City Plan	Staff Plan
Evaluation Date	December 31, 2018	December 31, 2018
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Amortization Method	Level Percentage of Payroll, 30-year closed beginning in 2018	Level Dollar, Layered, Closed
Remaining Amortization Period	30 years	30 years
Asset Valuation Method	Five-year smoothed market	Five-year smoothed market
Inflation	2.50%	2.50%
Salary Increases	3.25% - 28.25%	2.75% - 5.35%
Investment Rate of Return	7.00%	7.00%
Discount Rate	7.00%	7.00%
Retirement Age	Experience-based table of rates based on job classification and number of years since first retirement eligibility	Experience-based table of rates based on either number of years since first retirement eligibility or age.
Mortality	PubG-2010 Healthy Retiree Mortality Table for General Employees and PubS-2010 Healthy Retiree Mortality Table for Police Officers and Firefighters. Generational mortality improvements from the 2010 using the ultimate mortality improvement rates in the MP tables.	PubG-2010 Healthy Retiree Mortality Table. Generational mortality improvements from the year 2010 using the ultimate mortality improvement rates in the MP tables.
Cost-of-Living Adjustment	A 2% cost-of-living adjustment (COLA) is assumed for all members in the guaranteed COLA program, zero COLAs are assumed for members with a Variable COLA. Timing of Conditional Ad Hoc COLAs is based on an open group projection.	4.0% COLAs are assumed for members participating in the ad-hoc COLA program.

Fort Worth Employees' Retirement Fund
Notes to Required Supplementary Information
For Year Ended September 30, 2018

	City Plan	Staff Plan
Evaluation Date	December 31, 2017	December 31, 2017
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Amortization Method	Level Percentage of Payroll, Open	Level Percentage of Payroll, Open
Remaining Amortization Period	30 years	30 years
Asset Valuation Method	Five-year smoothed market	Five-year smoothed market
Inflation	2.75%	2.75%
Salary Increases	2.75% - 16.00%	3.0% - 4.0%
Investment Rate of Return	7.75%	7.75%
Discount Rate	5.35%	7.75%
Retirement Age	Experience-based table of rates based on job classification and number of years since first retirement eligibility.	Experience-based table of rates based on job classification and number of years since first retirement eligibility.
Mortality	RP-2014 Healthy Annuitant Mortality Table set forward three years for males and females. Generational mortality improvements using Scale MP-2015 are projected from the year 2014.	RP-2014 Healthy Annuitant Mortality Table set forward three years for males and females. Generational mortality improvements using Scale MP-2015 are projected from the year 2014.
Cost-of-Living Adjustment	A 2% cost-of-living adjustment (COLA) is assumed for all members in the guaranteed COLA program, zero COLAs are assumed for members participating in the Ad-Hoc COLA program.	A 2.0% cost-of-living adjustment (COLA) is assumed for all members in the guaranteed COLA program, 4.0% COLAs are assumed for members participating in the Ad-Hoc COLA program.

OTHER SUPPLEMENTARY INFORMATION

Schedule of Administrative Expenses

Schedule of Administrative Expenses
Years Ended September 30, 2019 and 2018

	2019	2018
Administrative Office		
Staff and Benefits	$ 1,912,354	$ 1,842,840
Contributions to Retirement Fund	241,933	250,045
Due Diligence	13,635	5,699
Medical Reviews	2,325	4,855
Insurance	157,233	125,546
Office Expense	229,674	182,963
Building Expenses	231,643	200,702
Conferences and Training	43,607	43,852
Strategic Planning	-	37,185
Pension Administration Hosting	167,550	153,103
Pension Administration Programming	446,435	79,137
Equipment and Supplies	61,945	61,318
Total Administrative Office	3,508,332	2,987,245
Professional Services		
Actuarial Services	221,376	112,485
Accounting and Auditing	53,800	42,250
Consulting	1,377,678	1,409,714
Legal Services	215,944	143,518
Other Consulting	262,139	140,670
Total Professional Services	2,130,937	1,848,637
Total Administrative Expenses	**$ 5,639,269**	**$ 4,835,882**

Schedule of Investment Management Fees

As of September 30, 2019 and 2018

	2019	2018
Domestic Fixed Income		
Aberdeen Asset Management	$ 402,861	$ 395,125
Garcia Hamilton	143,472	136,509
Pacific Investment Management	518,786	544,621
Total Domestic Fixed Income	1,065,119	1,076,255
International Fixed Income		
Loomis Sayles	180,026	191,625
Total International Fixed Income	180,026	191,625
Real Estate		
Citigroup REITS	10,766	127,159
Heitman Core	423,389	418,342
Heitman Global REIT	127,085	144,923
IPI Data Centers	711,591	-
M & G Real Estate	14	14
Prologis	180,565	128,326
SC Capital	63,835	-
SC Core	-	190
Stratford Land Fund	-	(3,868)
UBS Trumball	308,642	242,317
Total Real Estate	1,825,887	1,057,403
Domestic Equities		
Frontier Capital	574,905	611,458
Westwood	679,273	727,910
Total Domestic Equities	1,254,178	1,339,368
International Equities		
Franklin Templeton	648,662	740,360
Manning & Napier	-	272,335
Northern Trust	156,137	175,802
Wellington Horizons	463,802	183,489
William Blair	341,159	346,364
Total International Equities	1,609,760	1,718,350

Schedule of Investment Management Fees
As of September 30, 2019 and 2018
(Continued)

	2019	2018
Real Return		
Harvest	$ 256,159	$ 263,281
Total Real Return	256,159	263,281
Alternative		
Albourne America	405	452
ERF Private Equity Program	86,905	69,604
Hamilton Lane	124,507	103,643
Total Alternative	211,817	173,699
Custody Fees		
Northern Trust	400,557	423,660
Total Custody Fees	400,557	423,660
Total Investment Expenses	**$ 6,803,503**	**$ 6,243,641**

Schedule of Professional Services

As of September 30, 2019 and 2018

	2019	2018
Professional Fees		
Albourne America	$ 400,000	$ 400,000
Alignium	102,799	99,805
Aon Hewitt	127,099	-
DLA Piper	69,188	20,100
Eide Bailly	53,800	42,250
Fisher Broyles	-	112
Fox Rothchild	390	702
Gabriel, Roeder and Smith, Actuary	221,376	112,485
Global Governance	-	5,990
Hamilton Lane	650,000	691,576
Ice Miller	8,710	62,594
Jackson Walker, Attorneys	137,298	56,314
Korn Ferry	75,040	-
LRLW Consulting	-	52,560
Lynn Law	358	-
Lynn Ross	-	3,696
McElvaney Public Affairs	60,000	5,000
RVK, Inc.	224,879	218,333
The Eppstein Group/Capitol Alliance	-	70,000
Whitney & Smith	-	7,120
Total Professional Fees	**$ 2,130,937**	**$ 1,848,637**

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

To the Board of Trustees
Employees' Retirement Fund of the
City of Fort Worth, Texas

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the combined financial statements of the Employees' Retirement Fund of the City of Fort Worth, Texas (the Fund) which comprise the combined statement of fiduciary net position and the related combined statement of changes in fiduciary net position as of and for the year then ended September 30, 2019, and the related notes to the combined financial statements, which collectively comprise the Fund's combined financial statements, and have issued our report thereon dated December 19, 2019.

Internal Control over Financial Reporting

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

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

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over financial reporting that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses. We did identify certain a deficiency in internal control, described in the accompanying schedule of findings and responses as item 2019-001 that we consider to be a significant deficiency.

Compliance and Other Matters

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

The Fund's Response to Findings

The fund's response to the findings identified in our audit is described in the accompanying *schedule of findings*. The fund's response was not subjected to the auditing procedures applied in the audit of the financial statements and, accordingly, we express no opinion on it.

Purpose of this Report

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

Eide Bailly LLP

Boise, Idaho
December 19, 2019

Section II – Financial Statement Findings

2019-001

Criteria: Journal entries, supporting documents, statements, and schedules from the custodian should be reviewed by management.

Condition: The Fund's internal control system identified an error that was not corrected appropriately by the custodian on one investment manager statement. Management did not verify the adjustment was made correctly prior to the close of the fiscal year.

Cause: System limitations of custodian software led to an incorrect journal entry by the custodian in order to reconcile cash balances. The issue was identified by the Fund and questioned, however the issue was not reviewed by management to determine it had been correctly adjusted. The difference was not resolved prior to year-end close.

Effect: An adjustment to the financial statements was made. The adjustment was a reclassification of assets and liabilities and had no effect on net position restricted for pension or change in net position.

Recommendation: Management should ensure controls are in place to review supporting schedules against the custodian statements to ensure any differences are addressed and adjusted correctly in the custodian statements.

Views of Responsible Officials: Management agrees with the finding and implemented a control structure in response. All investment and custodian statements are reviewed by management prior to year-end close, and all journal entries posted by the custodian in September are communicated to and reviewed by management.

INVESTMENT SECTION

Will Rogers Memorial Center

Annual Consultant Review

Board of Trustees
Fort Worth Employees Retirement Fund
3801 Hulen Street, Suite 101
Fort Worth, TX 76107

Dear Board of Trustees:

This letter serves to provide an overview of the capital markets and the Employees' Retirement Fund of the City of Fort Worth, Texas ("Fund") portfolio positioning for the fiscal year ended September 30, 2019.

The 2019 fiscal year (October 1, 2018 to September 30, 2019) was characterized by volatility in global equity markets and strong performance in global bond markets. The first quarter of the fiscal year (October 1, 2018 to December 31, 2018) saw a nearly 13% decline in the global equity market (as defined by the MSCI All Country World Index), as global growth forecasts, inflation expectations, and corporate earnings expectations all contributed to negative sentiment and a sell-off in equity markets. Volatility persisted throughout the fiscal year as geopolitical concerns, trade tensions, and low growth expectations continued to influence markets. However, economic fundamentals in the U.S. remained strong, and the broad global equity market (largely driven by large cap US equities) recouped losses experienced in the first quarter and ended the fiscal year with a return of 1.38%. Throughout the year, bond markets produced steady, positive returns, as volatility and growth concerns coupled with central bank policy action drove strong performance. The Bloomberg US Aggregate Bond Index finished the fiscal year with a return of 10.30% (the highest fiscal year return for the index in 10 years).

The Federal Reserve Open Market Committee ("FOMC") began the fiscal year by increasing the federal funds target rate by 25 basis points in December 2018, then pivoted to a more accommodative stance by the end of the fiscal year in response to weak inflation and growth expectations. The FOMC lowered the target federal funds rate by 25 basis points each in July and September 2019, then proceeded with an additional 25 basis point reduction at its October meeting.

Globally, other central banks responded to low growth expectations with accommodative policy of their own. The European Central Bank ("ECB") responded to euro area weakness by announcing its intention to restart its quantitative easing program in November 2019. A number of other foreign central banks, including the People's Bank of China, delivered accommodative policy messages and introduced programs intended to support economic growth.

The Fund's current actuarial assumed rate of return is 7.00% (lowered from 7.75% during FY

RVKInc.com

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2019), which represents the Fund's long-term return goal. The Fund's overall investment return over the past year was 3.03% and the Fund's three-year annualized return was 7.16%. The five-year annualized return for the Fund was 5.71% and the Fund's ten-year annualized return was 7.09%.

At the end of the fiscal year 2019, the Capital Preservation and Liquidity composites were slightly above their maximum target range. All other composites were within policy ranges. The Diversification composite was the most underweight asset class relative to its long-term target.

During the fiscal year, Staff, the Board, and RVK, Inc. ("RVK") conducted a review of the Inflation asset class, resulting in an adjustment to the sub-asset class target weights and the funding of a new diversified inflation strategies manager. The annual asset allocation analysis was also conducted, and no changes were made to the broad asset class long-term targets. Later in the year, a review of the Diversification asset class was started and remains an ongoing project. The Board and RVK will continue to monitor the portfolio, recommending any enhancements that can improve potential return and/or diversification.

The Fund's investment policies, goals, and objectives, as well as the performance of its assets and transaction costs are regularly monitored by the Board and by RVK. These evaluations include analysis of the investment management firms and the custodial bank that serve the Fund.

The Fund's publicly traded assets managed through separate accounts are held in custody at Northern Trust. Market values and returns referenced above are based upon statements prepared by Northern Trust. Their statements are, to the best of our knowledge, reliable and accurate. Investment performance is calculated using a time-weighted rate of return methodology (net of fees) based upon market values and cash flows.

We look forward to continuing to work with Staff and the Board to monitor, review, and best position the Fund's portfolio to meet its long-term goals and objective.

Sincerely,

Rebecca A. Gratsinger

Rebecca Gratsinger
Chief Executive Officer
RVK, Inc.

Investment Summary

As of September 30, 2019

Asset Class	9/30/2019 Market Value	Market Value %
Equities	**$ 876,833,877**	**37.98%**
Global Equities	505,174,589	
Domestic Small Cap	157,240,162	
International Developed	78,668,460	
International Small Cap	77,452,051	
Emerging Markets	58,298,615	
Fixed Income	**518,769,536**	**22.47%**
Core	96,770,477	
Core Plus	334,440,351	
High Yield	45,397,415	
Emerging Markets	42,161,293	
Alternative Investments	**792,840,758**	**34.34%**
Real Estate	222,326,872	
Private Equity	295,501,375	
Absolute Return	275,012,511	
Real Return	**64,471,264**	**2.79%**
MLPs	26,503,112	
Real Assets	37,968,152	
Cash Equivalents	**55,703,578**	**2.41%**
Total Asset Allocation	**$ 2,308,619,013**	**100.0%**
Reconciling Items to Statement of Net Position		
Accrued Income	$ (4,765,592)	
Broker Receivables	(210,963,804)	
Broker Payables	281,455,382	
Securities Lending Collateral	129,464,532	
Total Investments Statement of Net Position	**$ 2,503,809,531**	

Investment Managers

GLOBAL EQUITIES:

Frontier Capital Management

Franklin Templeton

Northern Trust

Wellington Horizons

Westwood Holdings

William Blair

REAL RETURN:

Harvest Fund Advisors

Nuveen

GLOBAL FIXED INCOME:

Aberdeen Asset Management

Garcia Hamilton

Loomis Sayles & Company

PIMCO

Stone Harbor Investment Partners

REAL ESTATE:

AEW Capital Management

Ascentris

Campus Clarion

Contrarian Capital Management

Barings Real Estate

Crow Holdings

Focus Healthcare Partners

Hammes Partners

Heitman

IPI

Liquid Realty Partners

M&G Investments

New Boston Real Estate

Prologis

Rockspring Capital

SC Capital Partners

Stratford Land

UBS Realty Advisors

WestRiver Capital

Investment Policies Summary

The Board of Trustees (the Board) of the Fort Worth Employees' Retirement Fund (the Fund) has adopted an Investment Policy Statement as a framework for the investment of the Fund's assets. The authority to amend that statement rests solely with the Board. The following provides a brief outline of that statement. A copy of the Investment Policy Statement can be found in its entirety on the Fund's website.

Board of Trustees

The Board is responsible for overseeing the investment of the funds supporting the retirement and disability pension plans. Its primary duty is to set the asset allocation by determining the asset classes to be used and allocating a certain percentage of funds to each class. The Board follows the Uniform Prudent Investor Act of Texas and diversifies investments in order to achieve an optimal rate of return for a reasonable amount of risk. It is also responsible for setting an investment policy detailing the process for hiring, evaluating, and terminating investment managers. The Board has the authority to hire investment consultants, investment managers, and custodian banks to assist in the investment and oversight responsibility.

Investment Committee

The Investment Committee is established by the Board and has been delegated certain duties and functions by the Board. The Investment Committee makes recommendations to the Board on investment actions; however, ultimate responsibility for investment and asset allocation decisions remains with the Board. Most investment-related discussions currently occur during the normal Board meetings where staff and consultant(s) brief the Board on any topics or issues pertinent to the Fund's investment operations and make recommendations for appropriate courses of action. The Investment Committee meets when the full Board assents to hold an Investment Committee meeting, typically this occurs to allow investment-related topics that need extended discussions to receive proper vetting.

Funding Philosophy

The Fund's overall objective is to achieve the highest level of investment performance that is compatible with its risk tolerance and prudent investment practices. Because of the long-term nature of the Fund's pension liabilities, the Trustees maintain a long-term perspective in formulating and implementing the Fund's investment policies, and in evaluating its investment performance. Based on general beliefs about the long-term investment returns available from a well-diversified portfolio, the Trustees adopted the following Total Fund Investment Objectives:

- Within the framework of prudent risk limitations, the minimum investment objective is to achieve an average long-term total rate of return which satisfies the actuarial assumed rate of return. The actuarial rate of return is set at 7.0%.
- The Fund shall also strive to achieve investment performance that exceeds the rate of inflation over time, thereby providing a real rate of return.
- The Fund's assets shall earn a sufficient total rate of return over time to meet all benefit and expense obligations.

Liquidity Posture

Liquidity considerations are low in the short-term and intermediate-term, resulting in an immaterial impact upon investment policy, objectives, and guidelines. However, the Board has made efforts to identify allocations and investments subject to liquidity risk in the portfolio. Compared to public markets, illiquid investments require significant oversight mainly stemming from the lack of transparency within these strategies and the markets in which they invest. Therefore, to assist staff, the Board has retained outside consultants who focus on those areas of the portfolio where liquidity risk is most prevalent.

Risk

The investment risk philosophy for the Fund is based on the precepts of capital market theory that are generally accepted and followed by institutional investors, who by definition are long-term oriented investors. Investment risk reflects the possibility that the value of the Fund's investments will diverge from allocation strategy as a result of changes in market conditions, whether those changes are caused by factors specific to the individual investment or factors affecting all investments traded in the market. The assumption of investment risk is necessary to meet the Fund's obligations at a reasonable cost. The Board's goal of risk management is not to eliminate risk but to find a balance between expected returns and the risks needed to generate those returns. Further, it is generally accepted that expected investment returns (positive or negative) increase with the amount of risk taken. As a result, risk is neither good nor bad; it is necessary to generate investment returns. Similarly, there is no "correct" level of risk - the greater the risk taken, the higher the expected return or loss. Through various policies, delegations, and the long-term strategic asset allocation, the Board defines the amount of risk to be taken by the Fund. The amount of risk assumed by the Board is also influenced by its approach to administering pension benefits.

Investment Manager Guidelines

Investment managers are subject to guidelines and objectives incorporated in the investment management agreement entered into by the Board and the respective investment managers. Investment managers are expected to perform their fiduciary duties as prudent experts skilled in such matters and, further, are expected to comply with all applicable state and federal statutes governing the investment of retirement funds. Within the context of the guidelines, the investment managers have full discretion with respect to the purchase and sale of individual securities and concentrations of similar securities. The Board requires that all investment managers seek the best execution for all trades ordered on behalf of the Fund.

Manager Evaluations

Managers of portfolios are evaluated periodically against predetermined benchmarks, such as appropriate market index or comparable peer group. All investment managers are required to make formal reports to the Fund of their activities and performance according to standards set forth in the Investment Policy Statement. In addition, Fund personnel and professional consultants engaged by the Board monitor, pursuant to instructions by the Board, manager performance and conformity with their mutually-agreed upon guidelines and objectives.

Schedule of Asset Allocations and Returns

Asset Class	September 30, 2019 Long-Term Allocation Target	Actual Allocation	Investment Performance (%)* 1 Yr	3 Yr	5 Yr
Global Equity	39.05%	37.98%	(1.44)	8.26	6.16
MSCI ACWI Index			1.38	9.71	6.65
Fixed Income	18.78%	22.47%	9.20	3.48	3.49
Barclays US Aggregate Index			10.30	2.92	3.38
Barclays Global Aggregate Index			7.60	1.59	2.00
Absolute Return	15.39%	11.91%	(2.39)	4.00	2.18
HFRI Fund of Funds Composite			(0.05)	3.14	1.94
Real Return	2.80%	2.79%	0.82	2.68	(0.15)
MSCI World Index (Gross)			2.42	10.82	7.79
Real Estate	13.08%	9.63%	4.38	6.52	7.65
NCREIF Property Index			6.24	6.76	8.57
Private Equity	9.90%	12.80%	13.70	17.33	14.86
Wilshire 5000 Index + 3%			6.04	16.29	13.90
Cash	1.00%	2.42%	2.44	1.73	1.14
90 Day T-Bill			2.31	1.58	1.00
Total Portfolio	100.00%	100.00%	3.03	7.16	5.71
Target Allocation Index			4.46	8.69	6.58

*The basis for investment return calculations: a time weighted rate of return based on the market rate of return.

Schedule of Top Ten Investments

As of September 30, 2019*

Name of Investment	Fair Value	Percent of Portfolio
Northern Trust Collective All Country World Investable	$ 256,237,911	11.67%
Northern Trust COLTV ACWI Diversified Multi Factor Index Fund	248,932,931	11.34%
William Blair Emerging Leaders Growth CIT Fund	46,288,097	2.11%
Heitman America Real Estate Trust LP FD	43,599,455	1.99%
Stone Harbor Invt FDS EM Debt	42,161,293	1.92%
Nuveen Real Asset Income Fund R6	37,965,955	1.73%
Greenspring Global Partners IV	34,991,163	1.60%
UBS Trumbull Property Fund	34,674,564	1.58%
Iguazu Investors (Cayman) LP	32,558,995	1.48%
Prologis European Properties Fund II	32,474,821	1.48%

* A complete list of the Fund's holdings is available at the Fund's office by appointment.

Schedule of Investment Management Fees and Commissions by Asset Class

As of September 30, 2019

	Management Fees	Brokers Fees	Assets Under Management
Asset Class			
Fixed Income	$ 1,245,145	$ 9,631	518,769,536
Real Estate	1,825,887	26,443	222,326,872
Equities	2,863,938	220,796	876,833,877
Real Return	256,159	22,329	64,471,264
Private Equity	211,817	379	295,501,375
Absolute Return			275,012,511
Custody/Cash	400,557	-	55,703,578
Totals	**$ 6,803,503**	**$ 279,578**	**$ 2,308,619,013**

Schedule of Brokers Fees

As of September 30, 2019

Broker Name	Number of Shares	Commission Paid	Commission per Share
ITG Inc.	654,878	$ 22,794	0.03
National Financial Services LLC	3,255,458	17,393	0.01
B. Riley & Co., LLC	539,405	16,182	0.03
Instinet, LLC	458,322	16,144	0.04
BOFA Securities, Inc.	321,448	12,392	0.04
Liquidnet, Inc	613,055	9,361	0.02
Goldman, Sachs & Co.	227,003	8,605	0.04
RBC Capital Markets, LLC	4,901,116	7,487	0
UBS Securities LLC	13,177,343	7,199	0
Raymond James & Associates, Inc.	174,483	6,435	0.04
Pershing LLC	5,941,062	5,990	0
J.P. Morgan Securities LLC	459,575,451	5,110	0
Credit Suisse Securities (USA) LLC	3,415,282	4,395	0
Barclays Capital Inc./Le.	121,060	4,310	0.04
Wells Fargo Securities, LLC	101,255	4,050	0.04
Morgan Stanley & Co. LLC	25,082,167,118	7,312	0
Merrill Lynch International Limited	19,436,204,258	3,273	0
J.P. Morgan Securities LLC/JPMC	92,836	3,032	0.03
Stifel, Nicolaus & Company, Incorporate	772,672	2,907	0
Citibank N.A.	11,958,330	2,852	0
Jefferies LLC.	6,069,202	2,690	0
UBS AG Stamford Branch	18,014,209	2,665	0
Societe Generale London Branch	399,309	2,572	0.01
Cowen Execution Services LLC	63,227	2,529	0.04
Goldman, Sachs & Co.	253,313,459	2,527	0
Oppenheimer & Co. Inc.	3,526,522	2,499	0
Jefferies LLC	229,905	2,374	0.01
Robert W. Baird & Co. Inc.	58,999	2,344	0.04
Instinet Europe Limited	63,375	2,283	0.04
Keybanc Capital Markets Inc	62,330	2,270	0.04
Stephens Inc.	1,287,163	2,236	0
Jefferies International Ltd	1,278,479	2,231	0
Wells Fargo Bank Minnesota Na	8,535,224	2,227	0
Sanford C. Bernstein & Co., LLC	264,211	2,123	0.01
Bank of America Corporation	2,004,595	2,113	0
UBS AG London Branch	439,235	2,010	0
Credit Suisse Securities(Europe)Ltd	1,561,467	2,009	0
Investment Technology Group Ltd.	281,995	1,883	0.01
Citigroup Global Markets Inc.Cp And Cd	78,164	1,871	0.02
Fidelity Clearing Canada, Ulc	80,398	1,820	0.02
Suntrust Capital Markets Inc.	47,222	1,744	0.04
Barclays Bank PLC (All U.K. Offices)	56,003	1,721	0.03
J.P. Morgan Securities PLC	19,434,795	1,603	0
Cowen and Company, LLC	66,362	1,598	0.02
Kepler Capital Markets	33,485	1,589	0.05
ISI Group Inc.	65,922	1,584	0.02
Joh. Berenberg,Gossler Und Co.Kg	49,532	1,562	0.03
Industrial and Commercial Bank of China	38,420	1,537	0.04

Schedule of Brokers Fees (Continued)

As of September 30, 2019

Broker Name	Number of Shares	Commission Paid	Commission per Share
Stifel Nicolaus & Co,Incororated	2,531,292	1,512	-
Mizuho Securities USA Inc.	26,251,158	1,451	-
Carnegie Investment Bank AB	150,916	1,392	0.01
RBC Dominion Securities Inc.	1,488,673	1,364	-
BMO Nesbitt Burns Inc	47,976	1,335	0.03
Pershing Securities Limited	98,259	1,314	0.01
Sanford C. Bernstein and Co., LLC	592,755	1,224	-
Barclays Capital	14,517,724	1,213	-
Citigroup Global Markets, Inc./Correspo	29,645	1,186	0.04
Parel	44,545	1,159	0.03
Nomura Securities New York	54,846,546	1,069	-
Virtu Americas LLC	30,075	1,065	0.04
Green Street Trading	25,401	1,016	0.04
Other	25,508,955,458	37,841	0.03
	70,951,685,468	$ 279,578	$ 0.00

ACTUARIAL SECTION

Modern Art Museum of Fort Worth

Photo by Shiva Shenoy

Actuary's Certification Letter

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

January 17, 2020

Board of Trustees
Employees' Retirement Fund of the City of Fort Worth
3801 Hulen Street, Suite 101
Fort Worth, TX 76107

Subject: Actuarial Valuations as of December 31, 2018

Members of the Board,

At the request of the Employees' Retirement Fund of the City of Fort Worth (FWERF), Gabriel Roeder Smith & Company (GRS) has performed the actuarial valuations of the Employees' Retirement Fund of the City of Fort Worth (City Plan) and the City of Fort Worth Employees' Retirement Fund Staff Retirement Plan (Staff Plan). The information in the Actuarial Section is based on our annual actuarial valuation reports for the two plans, with the most recent valuations conducted as of December 31, 2018, and is intended to be used in conjunction with the full reports. FWERF is an agent multiple-employer defined benefit pension plan covering employees of the City of Fort Worth and employees of the Employees' Retirement Fund of the City of Fort Worth.

This letter and the schedules listed below represent GRS' certification of the funded status as required for the financial report for the fiscal year ended September 30, 2019 for the City Plan and the Staff Plan.

In the Financial Section, GRS prepared the following:

- Sensitivity of the Net Pension Liability to Changes in Discount Rate,
- Schedule of Changes in the Net Pension Liability, and
- Schedule of Actuarially Determined Employer Contributions.

In the Actuarial Section, GRS prepared the following:

- Executive Summary,
- Schedule of Funding Progress,
- Development of Actuarial Value of Assets,
- Actuarial Gain or Loss,
- Analysis of Normal Cost by Component,
- Retirees, Beneficiaries, and Disabled Participants Added to and Removed from Rolls,
- Solvency Test, and
- Distribution of Active Members by Age and Years of Service.

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

Data

The valuation was based upon information as of December 31, 2018, furnished by FWERF staff, concerning system benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by FWERF staff.

Actuarial Assumptions and Methods

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on March 27, 2019 based on the experience investigation that covered the three-year period from January 1, 2016 through December 31, 2018. In accordance with the Administrative Rules of FWERF, all actuarial assumptions and methodologies must be adopted by the Board upon the advice of the actuary. We believe the assumptions for the funding valuation are internally consistent and are reasonable, based on the actual experience of FWERF, and meet the parameters of the Actuarial Standards of Practice issued by the Actuarial Standards Board.

A detailed account of the revised actuarial assumptions and methods can be found in our Actuarial Experience Study report dated March 26, 2019. A summary of key changes in assumptions and methods is highlighted below:

Economic Assumptions

- Decrease the price inflation assumption from 2.75% to 2.50%
- Decrease the nominal investment return assumption, net of investment-related expenses, from 7.75% to 7.00%
- For the City Plan, set ultimate salary scale assumption of 3.25% and update service-based salary increase rates for each employee group consistent with actual experience and step schedules
- For the City Plan, increase the assumed overtime pay for firefighters to 18.00% of base pay and increase the average earnings overtime load on blue service benefits for firefighters to 6.00%
- For the City Plan, maintain current payroll growth assumption equal of 3.00%
- For Staff Plan, set ultimate salary scale assumption of 2.75% and update service-based salary increase rates
- For Staff Plan, lower the payroll growth assumption to 2.50%

Mortality Assumptions

- Adopt healthy retiree mortality tables published in the Pub-2010 Public Retirement Plans Mortality Tables Report, separately applied for general employees (PubG-2010) and public safety personnel (PubS-2010), with future mortality improvements modeled using the ultimate mortality improvement rates in the MP tables
- Adopt disability retirement and employee mortality tables based on the appropriate Pub-2010 mortality table by employee group with future mortality improvements modeled using the ultimate mortality improvement rates in the MP tables

Other Demographic Assumptions

- Update termination rates consistent with City Plan and Staff Plan member experience and future expectations
- Update retirement rates consistent with City Plan and Staff Plan member experience and future expectations
- Every member who reaches Normal (Unreduced) Retirement eligibility prior to age 65 is assumed to enter DROP, leave active service in accordance with the assumed retirement rates, and participate in DROP for the maximum possible period upon departure from active service
- Members who terminate with a vested benefit are assumed to choose the most valuable option available to them at the time of termination: withdrawal of contributions or deferred annuity

Actuarial Methods and Policies

- Maintain asset smoothing method that recognizes each year's gain or loss over a closed five-year period and enhance method to allow for direct offsetting of unrecognized gains and losses
- For the City Plan, modify actuarial cost method to base the normal cost rate on the benefits payable to each individual active member, generally referred to as Individual Entry Age Normal (IEAN), which will require the funding period and Actuarially Determined Employer Contribution (ADEC) rate to be determined based on an open group projection.

The actuarial assumptions and methods used to develop the *Schedules of Changes in the Net Pension Liability* and the *Schedule of Actuarially Determined Employer Contributions*, noted above, also meet the parameters set forth in the disclosures presented in the Financial Section by Governmental Accounting Standards Board Statement No. 67.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. A review of the impact of a different set of assumptions on the funded status of the City Plan and the Staff Plan are outside the scope of this actuarial valuation.

The current actuarial assumptions are outlined in the section of the CAFR titled "Actuarial Assumptions and Methods."

Benefits

Changes to the City Plan were adopted by the Fort Worth City Council on December 11, 2018 and subsequently approved by a vote of the active employees of the City. These changes included:

1. Eliminate the COLA on the portion of the benefit associated with future service for current COLA-eligible (Tier 1) active members, effective July, 2019,
2. Eliminate COLAs applicable to active employees and deferred vested employees who have not retired or entered DROP on or before January 1, 2021,
3. Establish a Variable COLA for Tier 1 members who have not retired nor entered DROP on or before January 1, 2021, which can be granted in instances where plan funding meets the funding requirements of the Ordinance and the Variable COLA is approved by both the FWERF Board of Trustees and the City Council,
4. Eliminate future accruals of major medical and excess sick leave toward service and Final Average Compensation (FAC),
5. Increase the member contribution rate by 1.1% of pay for all General Employees, effective July, 2019,
6. Increase the member contribution rate by an additional 0.7% of pay for a period equal to the period of blue service for each individual General Employee, effective July, 2019,
7. Increase the member contribution rate by 1.8% of pay for all Police Officers and Firefighters, effective July, 2019, and an additional 2.0% of pay, effective January, 2020,
8. Increase the member contribution rate by an additional 0.6% of pay for all Police Officers, effective January, 2021,
9. Include overtime in the calculation of member contributions, effective July, 2019,
10. Increase the City contribution rate by 4.50% of pay, effective January, 2019,
11. Extend maximum DROP period to six years, and
12. Establish certain automatic risk-sharing contribution increases when plan funding is not meeting the funding requirements of the Ordinance.

Changes to the Staff Plan provisions were adopted by the FWERF Board of Trustees on September 25, 2019. These changes included:

1. Decrease the Automatic COLA to 1% beginning at age 60 for all current and future active members,
2. Eliminate sick leave conversion for all current and future active members,
3. Decrease the free survivor benefit to 50% for all current and future active members,
4. Increase the member contribution rate to 10.50% of pay,
5. Reduce interest on members contributions to 2.25% prospectively,
6. Apply a minimum retirement age of 55 for future active members, and
7. Eliminate the ability for future Staff Plan members to bridge their service from the City Plan into the Staff Plan.

The current benefit provisions are outlined in the section of the CAFR titled “Summary of Key Provisions.”

Funding Policy and Objectives – City Plan

As outlined in the City Code, the funding objective of the City Plan is to fund the sum of the normal cost, the assumed administrative expenses, and an amount necessary to eliminate the UAAL over a closed 30-year period beginning on December 31, 2018 with the goal of eliminating the UAAL by December 31, 2048. Contribution rates should be established which, over time, will remain level as a percent of payroll. As a result, the Actuarially Determined Employer Contribution (ADEC) is based on a closed 30-year amortization of the UAAL as a level percentage of payroll. This ADEC is the City contribution, in addition to the member contributions, that is necessary to meet the funding objective.

FWERF receives member contributions in accordance with the following schedule based on Member Contributory Payroll. Effective July, 2019, Member Contributory Payroll will change to include earnings from unscheduled overtime.

	Previous Contribution Rate	Statutory Contribution Rates Effective July 2019	Statutory Contribution Rates Effective January 2020	Statutory Contribution Rates Effective January 2021
General Employees	8.25%	9.35%	9.35%	9.35%
Police Officers	8.73%	10.53%	12.53%	13.13%
Firefighters	8.25%	10.05%	12.05%	12.05%

Based on the current composition of the active plan population, the average member rate will be approximately 11.10% of the Member Contributory Payroll once all of the contribution rates are completely phased in.

The City previously contributed 19.74% of the City Contributory Payroll for General and Fire members and 20.46% of the City Contributory Payroll for Police Officers to FWERF, as set by City ordinance. Effective January, 2019, the City contribution rate will increase by 4.50% of payroll. Based on the current composition of the active plan population and the new contribution rates, the average City rate will be approximately 24.48% of the City Contributory Payroll. The ADEC for 2019 is 31.43% of City Contributory Payroll, or $152.5 million, which exceeds the expected City contribution by 6.95% of City Contributory Payroll. As a result, the stated funding objective is not being met.

City Contributory Payroll includes unscheduled overtime for Tier 1 members and does not include unscheduled overtime for Tier 2 members.

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The City Code specifically defines an actuarially determined contribution (ADC) as a contribution "based on a closed 30-year funding of unfunded liabilities." In this context, the ADC is the sum of the anticipated member contributions and the City contributions. Since the City and the members contribute on a different payroll basis, it would not be accurate to add the City and member contribution rates together. As a result, the actuarial valuation will focus on the Actuarially Determined Employer Contribution (ADEC) for purposes of reporting required contribution rates so it is clear which payroll basis is being considered. However, the ADEC will simply be determined as the projected ADC less the anticipated member contributions.

The unfunded actuarial accrued liability (UAAL) of the City Plan increased from $1.67 billion as of December 31, 2017 to $2.11 billion as of December 31, 2018. The change in the UAAL is attributable to the following primary sources:

	In millions
December 31, 2017 UAAL	$1,668
Expected Increase	56
Benefit Changes	(144)
Assumption Changes	510
Actuarial Experience Loss	24
December 31, 2018 UAAL	$2,114

Additionally, the funded ratio of the City Plan—actuarial value of assets divided by the actuarial accrued liability—decreased from 57.8% to 52.4% as of December 31, 2018. The funded status is one of many metrics used to show trends and develop future expectations about the health of a retirement system. The funded status measure itself is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions since it does not reflect normal cost contributions, the timing of amortization payments, or future experience other than expected.

Funding Policy and Objectives – Staff Plan

On August 28, 2019, the FWERF Board of Trustees adopted the current funding policy for the Staff Plan. Under the current funding policy, the Total Funding Policy Contribution is determined as the sum of the normal cost, the assumed administrative expenses, and a structured payment towards eliminating the unfunded actuarial accrued liability (UAAL). The payments to the UAAL will be based on layered amortization where each layer is based on a 30-year level-dollar amortization schedule. The Actuarially Determined Employer Contribution (ADEC) is the Total Funding Policy Contribution minus the expected member contributions. The current funding policy directs the employer to contribute the ADEC to the Staff Plan each year.

Prior to the current funding policy, the employer contributed 15.74% of pay to the Staff Plan every year regardless of the financial condition of the Staff Plan.

The Staff Plan receives member contributions of 10.50% of payroll and employer contributions equal to the ADEC, as set by the current funding policy for the Staff Plan. The ADEC for 2019 is $348,046. On an actuarial value of assets basis, the current funding policy should be sufficient to first amortize the UAAL in 30 years.

The unfunded actuarial accrued liability (UAAL) of the Staff Plan increased from $1,340,754 as of December 31, 2017 to $2,341,994 as of December 31, 2018. The funded ratio of the Staff Plan—actuarial value of assets divided by the actuarial accrued liability—decreased from 77.2% to 68.9% as of December 31, 2018. The funded status is one of many metrics used to show trends and develop future expectations about the health of a retirement system. The funded status measure itself is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions since it does not reflect normal cost contributions, the timing of amortization payments, or future experience other than expected.

Certification

All of our work conforms with generally accepted actuarial principles and practices, and to the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of, where applicable, the Governmental Accounting Standards Board, the Internal Revenue Code and ERISA.

The signing actuaries are independent of the plan sponsor. They are each Enrolled Actuaries, Fellows of the Society of Actuaries, and Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, each of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

R. Ryan Falls, FSA, EA, MAAA
Senior Consultant & Actuary

Joseph P. Newton, FSA, EA, MAAA
Pension Market Leader & Actuary

GRS Retirement Consulting

Executive Summary

	City Plan		Staff Plan	
	December 31, 2018	December 31, 2017	December 31, 2018	December 31, 2017
Membership				
• Number of				
- Active members	6,589	6,579	16	18
- Retirees and beneficiaries	4,583	4,391	1	0
- Inactive, vested	375	375	7	5
- Inactive, nonvested	660	724	1	1
- Total	12,207	12,069	25	24
• Member Contributory Payroll	$ 494,152,294	$ 442,444,781	$ 1,494,667	$ 1,582,239
• Employer Contributory Payroll	$ 485,336,445	$ 460,564,650	$ 1,494,667	$ 1,582,239
Effective Contribution Rates				
• Members	11.10%	8.41%	8.25%	8.25%
• Employer	24.48%	19.99%	15.74%	15.74%
Actuarially Determined Employer Contribution	$ 152,541,245	$ 129,464,723 *	$ 348,046	$ 251,209 *
• % of Employer Contributory Payroll	31.43%	28.11% *	23.29%	15.88% *
• Amortization Period	30 years	30 years	30 years	30 years
Assets				
• Fair value (FVA)	$ 2,147,041,319	$ 2,323,717,570	$ 4,916,880	$ 4,768,637
• Actuarial value (AVA)	$ 2,324,698,216	$ 2,288,265,169	$ 5,189,502	$ 4,533,706
• Return on fair value	-3.6%	14.6%	-3.9%	19.7%
• Return on actuarial value	5.9%	7.2%	6.7%	8.1%
Actuarial Information on AVA (smoothed)				
• Normal cost % (exclude admin)	15.97%	12.70% *	20.04%	17.38%
• Total normal cost	$ 78,916,121	$ 56,190,487 *	$ 299,531	$ 274,993
• Actuarial accrued liability	$ 4,438,326,161	$ 3,956,724,359	$ 7,531,496	$ 5,874,460
• Unfunded actuarial accrued liability (UAAL)	$ 2,113,627,945	$ 1,668,459,190	$ 2,341,994	$ 1,340,754
• Funded ratio	52.4%	57.8%	68.9%	77.2%
• Funding period (years)	44	Infinite	30	32
Actuarial Information on FVA				
• Unfunded actuarial accrued liability (UAAL)	$ 2,291,284,842	$ 1,633,006,789	$ 2,614,616	$ 1,105,823
• Funded ratio	48.4%	58.7%	65.3%	81.2%
• Funding period (years)	$ 55	Infinite	30	22

Actuarial Assumptions and Methods – City Plan

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees (Board) on March 27, 2019 based on the experience investigation that covered the three-year period from January 1, 2016 through December 31, 2018. In accordance with the Administrative Rules of the Fort Worth Employees' Retirement Fund (the Fund) , all actuarial assumptions and methodologies must be adopted by the Board upon the advice of the Actuary.

I. Valuation Date

The valuation date is December 31 of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation is used to determine the adequacy of the current City contribution rate, describe the current financial condition of the Fund, analyze changes in the condition of the Fund, and provide various summaries of the data.

The actuarial valuation uses the Entry Age Normal (EAN) actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: the member's contribution rate and the remaining portion of the normal cost rate which is the employer's normal cost rate. Further, the total normal cost was determined using the "replacement life" application of EAN where the normal cost is based on each member's current benefit structure as though it has always been in place.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of the actuarial value of assets and the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The projected funded status and the Actuarially Determined Employer Contribution (ADEC) are calculated based on the assumption that: (a) future market earnings, net of investment-related expenses, will equal 7.0% per year; there will be no liability gains/losses or changes in assumptions; active members who leave employment will be replaced by new entrants each year such that the Member Contributory Payroll grows at the same rate as the payroll growth assumption; and contributions will remain the same percentage of payroll.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment returns in excess of (less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continuing to be recognized on their original timeframe. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). In no event will this amount exceed 120% of market value or be less than 80% of market value.

IV. Actuarial Assumptions

Investment Return: 7.0% per year, net of investment-related expenses (composed of an assumed 2.5% inflation rate and a 4.5% real rate of return).

Mortality Decrements:

Pre-retirement

PubG-2010 Employee Mortality Table for General Employees and PubS-2010 Employee Mortality Table for Police Officers and Firefighters. Generational mortality improvements projected from the year 2010 using the ultimate mortality improvement rates in the MP tables.

Healthy Annuitants

PubG-2010 Healthy Retiree Mortality Table for General Employees and PubS-2010 Healthy Retiree Mortality Table for Police Officers and Firefighters. Generational mortality improvements projected from the year 2010 using the ultimate mortality improvement rates in the MP tables. The mortality for all surviving beneficiaries will be based on the PubG-2010 Healthy Retiree Mortality Table.

Disabled Annuitants

PubG-2010 Disability Mortality Table for General Employees and PubS-2010 Disability Mortality Table for Police Officers and Firefighters. Generational mortality improvements projected from the year 2010 using the ultimate mortality improvement rates in the MP tables.

In Line of Duty Death

The percentage of pre-retirement deaths assumed to be in the line of duty are:

General Employees:	0%
Police Officers:	10%
Firefighters:	10%

Service Retirement Decrements:

Members Who Reach 80 Points Before Age 65

The following rates reflect the members expected departure from active service and are applied based on years since first becoming eligible for Normal Retirement:

Year of Eligibility	General Employees	Police Officers	Firefighters
1st	30%	15%	5%
2nd	15	10	5
3rd	20	10	10
4th	25	20	10
5th	25	30	25
6th	35	50	50
7th	35	50	50
8th	35	50	50
9th	35	50	50
10th	100	100	100

Tier 2 General Employees who reach 80 points (age plus years of eligibility service) prior to age 55 will have their retirement rate increased by 20% in their first year of eligibility.

All members eligible for Normal Retirement prior to January 1, 2021 are assumed to enter DROP and retain their COLA election.

Members Who Do Not Reach 80 Points Before Age 65

The following rates reflect the members expected departure from active service and are applied based on the member's age:

Age	**General Employees**	**Police Officers**	**Firefighters**
65-69	27.5%	100%	100%
70+	100	100	100

Early (Reduced) Retirement

Police Officers and Firefighters have zero assumed probability of retiring prior to eligibility for Normal (Unreduced) Retirement. The following age-based rates apply for General Employees:

Age	**General Employees**
50-56	1.5%
57-58	2.5
59-61	3.5
62	8.0
63-64	2.5

Deferred Retirement Option Program (DROP)

Every member who reaches Normal (Unreduced) Retirement eligibility prior to age 65 is assumed to enter DROP, leave active service in accordance with the assumed retirement rates, and have participated in DROP for the maximum possible period upon departure from active service.

Inactive Vested Participants

Members that terminate with a vested benefit are assumed to choose the most valuable option available to them at the time of termination: withdrawal of contributions or deferred annuity. Dependents of vested members that die prior to reaching Normal Retirement are assumed to elect a withdrawal of contributions.

Disability Retirement Decrements:
<u>Disability Rates</u>

Rates for males and females at selected ages are shown below:

Age	Rate
20	0.005%
25	0.006
30	0.009
35	0.013
40	0.018
45	0.027
50	0.044
55	0.076
60	0.100

<u>In Line of Duty Disability</u>

The percentage of disability retirements assumed to be in the line of duty are:

General Employees:	0%
Police Officers:	40%
Firefighters:	15%

Termination Decrements for Reasons Other Than Death or Retirement:
<u>Withdrawal Rates</u>

The following service-based rates apply:

Years of Service	General Employees	Police Officers	Firefighters
0	22.0%	7.0%	3.0%
1	15.0	2.0	0.5
2	14.0	1.8	0.5
3	11.0	1.6	0.5
4	9.0	1.5	0.5
5		1.4	0.5
6	*See age-based*	1.3	0.5
7	*termination rates*	1.2	0.5
8	*after five years of*	1.1	0.5
9-11	*employment*	1.0	0.5
12-16		1.0	0.4
17+		0.6	0.4

After the first five years of employment, age-based rates apply as shown below for General Employees:

Age	Rate
25-29	11.5%
30-34	7.5
35-39	6.0
40-44	5.0
45-49	4.5
50-54	3.2
55-59	2.3
60-64	2.0

All rates of termination are zero for members eligible for Normal Retirement.

Salary Increases: Increases are assumed to occur at the beginning of the valuation year and vary by employee group. Salary increases include an underlying inflation component of 2.50% and a productivity component of 0.75%.

Years of Service	General Employees	Police Officers	Firefighters
0	5.85%	28.25%	18.25%
1	5.65	18.25	15.25
2	5.45	8.25	8.25
3	5.25	8.25	9.75
4	5.05	8.25	9.75
5	4.85	5.75	5.75
6	4.65	4.50	3.25
7	4.45	4.50	3.25
8	4.25	4.50	4.75
9	4.05	4.50	4.75
10	3.85	4.50	3.25
11	3.65	4.50	3.25
12	3.45	4.50	3.25
13	3.25	4.50	4.75
14	3.25	5.75	4.75
15	3.25	5.75	3.25
16	3.25	5.75	3.25
17	3.25	5.75	3.25
18	3.25	4.50	3.25
19+	3.25	3.25	3.25

Valuation Payroll is the expected Regular Earnings for the calendar year following the valuation date. It is generally based on the actual pay for the prior year and increased with one year of expected salary increase.

Overtime Pay: Pay for Blue Service benefits for the upcoming year is based on the Valuation Payroll and increased by the following loads to account for unscheduled overtime pay:

General Employees:	3.50%
Police Officers:	7.00%
Firefighters:	18.00%

Average Earnings Overtime Load: Blue Service benefits are loaded by the following percentages to account for higher than usual overtime worked during the final average earnings period:

General Employees:	0.00%
Police Officers:	2.00%
Firefighters:	6.00%

Sick Leave Service Conversions: Retirement and terminated vested benefits are loaded by the following percentages to account for additional service accrued for unused sick and major medical leave:

General Employees:	3.75%
Police Officers:	2.00%
Firefighters:	2.50%

Due to the elimination of future accruals of excess sick leave used toward service and FAC at retirement, these load percentages are phased out for each individual member over a 20-year period based on their service as of December 31, 2018.

Cost-of-Living Adjustments (COLA): Members who have the Guaranteed 2% COLA are assumed to receive a 2% increase of their base pension amount. The open group projection associated with this valuation incorporates the provisions of the Conditional Ad-Hoc COLA and the liability associated with future expected Conditional Ad-Hoc COLAs.

Administrative Expenses: $6,000,000 for 2019. This amount includes approximately $1,000,000 of one-time expenses for 2019 which are not expected to continue beyond 2019. This amount is reviewed annually based on input from Fund staff.

Payroll Growth: Member Contributory Payroll is assumed to grow at 3.0% per year. Future City Contributory Payroll incorporates the expected transition of the City contributing on Earnings with Overtime for Tier 1 members to the City contributing on Regular Earnings for Tier II members. As a result, the City Contributory Payroll is expected to increase by approximately 2.8% over the next 30 years.

Marital Assumptions: 80% of male members and 60% of female members are assumed to be married. Male member is assumed to be four years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the middle of the valuation year.

Census Data and Assets:

- The valuation was based on members of the Fund as of December 31, 2018 and does not take into account future members.
- All census data was supplied by the Fund and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.
- Asset data was supplied by the Fund .

Actuarial Assumptions and Methods – Staff Plan

The assumptions and methods applied in this actuarial valuation were adopted by the Board of Trustees on March 27, 2019 based on the experience investigation that covered the three-year period from January 1, 2016 through December 31, 2018.

I. Valuation Date

The valuation date is December 31 of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The actuarial valuation is used to determine the employer contribution, describe the current financial condition of the Staff Plan, analyze changes in the condition of the Staff Plan, and provide various summaries of the data.

The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the first step is to determine the contribution rate (level as a percentage of pay) required to provide the benefits to each member, or the normal cost rate. The normal cost rate consists of two pieces: the member's contribution rate and the remaining portion of the normal cost rate which is the employer's normal cost rate. The total normal cost rate is based on the plan provisions that apply to each individual member.

The Unfunded Actuarial Accrued Liability (UAAL) is the liability for future benefits which is in excess of the actuarial value of assets and the present value of future normal costs. The employer contribution provided in excess of the employer normal cost is applied to amortize the UAAL.

The funding period is the earliest date that the UAAL is expected to be less than or equal to zero based on the UAAL amortization schedule.

The Entry Age actuarial cost method is an "immediate gain" method (i.e., experience gains and losses are separately identified as part of the UAAL). However, they are amortized over the same period applied to all other components of the UAAL.

III. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment returns in excess of (less than) expected investment income. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continuing to be recognized on their original timeframe. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). In no event will this amount exceed 120% of market value or be less than 80% of market value.

IV. *Actuarial Assumptions*

Investment Return: 7.0% per year, net of investment-related expenses (composed of an assumed 2.5% inflation rate and a 4.5% real rate of return)

Mortality Decrements:

Pre-retirement

PubG-2010 Employee Mortality Table. Generational mortality improvements projected from the year 2010 using the ultimate mortality improvement rates in the MP tables.

Healthy Annuitants

PubG-2010 Healthy Retiree Mortality Table. Generational mortality improvements projected from the year 2010 using the ultimate mortality improvement rates in the MP tables.

Disabled Annuitants

PubG-2010 Disability Mortality Table. Generational mortality improvements projected from the year 2010 using the ultimate mortality improvement rates in the MP tables.

In Line of Duty Death

0% of pre-retirement deaths are assumed to be in the line of duty.

Service Retirement Decrements:

Members Who Reach 80 Points by Age 65

The following rates reflect the members expected departure from active service and are applied based on years since first becoming eligible for Normal Retirement:

Year of Eligibility	Rate
1st	30%
2nd	15
3rd	20
4th	25
5th	25
6th	35
7th	35
8th	35
9th	35
10th	100

Upon reaching age 70, all eligible members are assumed to retire even if they are less than ten years past first eligibility for Normal Retirement.

Members Who Do Not Reach 80 Points by Age 65

The following rates reflect the members expected departure from active service and are applied based on the member's age:

Age	Rate
65-69	27.5%
70+	100

Early (Reduced) Retirement

Members have zero assumed probability of retiring prior to eligibility for Normal (Unreduced) Retirement.

Deferred Retirement Option Program (DROP)

Every member who reaches Normal (Unreduced) Retirement eligibility prior to age 65 is assumed to enter DROP, leave active service in accordance with the assumed retirement rates, and have participated in DROP for the maximum possible period upon departure from active service.

Inactive Vested Participants

Members that terminate with a vested benefit are assumed to choose the most valuable option available to them at the time of termination: withdrawal of contributions or deferred annuity. Dependents of vested members that die prior to reaching Normal Retirement are assumed to elect a withdrawal of contributions.

Disability Retirement Decrements:
Members have zero assumed probability of retirement due to disability.

Termination Decrements for Reasons Other Than Death or Retirement:
Withdrawal Rates
The following service-based rates apply:

Years of Service	Rate
0	22.0%
1	15.0
2	14.0
3	11.0
4	9.0

After the first five years of employment, age-based rates apply as shown below:

Age	Rate
25-29	11.5%
30-34	7.5
35-39	6.0
40-44	5.0
45-49	4.5
50-54	3.2
55-59	2.3
60-64	2.0

All rates of termination are zero for members eligible for Normal Retirement.

Salary Increases: Increases are assumed to occur at the beginning of the valuation year. Salary increases include an underlying inflation component of 2.50% and a productivity component of 0.25%.

Years of Service	Rate
0	5.35%
1	5.15
2	4.95
3	4.75
4	4.35
5	4.35
6	4.15
7	3.95
8	3.75
9	3.55
10	3.35
11	3.15
12	2.95
13	2.75
14	2.75
15	2.75
16	2.75
17	2.75
18	2.75
19+	2.75

Valuation Payroll is the expected Regular Earnings for the calendar year following the valuation date. It is generally based on the actual pay for the prior year and increased with one year of expected salary increase.

Overtime Pay: Members are not assumed to receive compensation to account for unscheduled overtime pay.

Cost-of-Living Adjustments (COLA): Members who have the Conditional Ad-Hoc COLA are assumed to receive 4% annual increases.

Administrative Expenses: $23,000 for 2019. This amount is reviewed annually.

Payroll Growth: Total payroll is assumed to grow at 2.5% per year.

Marital Assumptions: 100% of members are assumed to be married. Male member is assumed to be four years older than female beneficiary; and female member is assumed to be the same age as male beneficiary.

Decrement Timing: All decrements – mortality, service retirement, disability retirement, and termination of employment for reasons other than death or retirement – are assumed to occur at the middle of the valuation year.

Census Data and Assets

- The valuation was based on members of the Staff Plan as of December 31, 2018 and does not take into account future members.
- All census data was supplied by Fund staff and was subject to reasonable consistency checks.
- There were data elements that were modified for some members as part of the valuation in order to make the data complete. However, the number of missing data items was immaterial.
- Asset data was supplied by Fund staff.

Schedule of Funding Progress

City Plan

Actuarial Valuation Date		Actuarial Value of Assets (AVA) (a)		Actuarial Accrued Liability (AAL) (b)		Unfunded Actuarial Accrued Liability (UAAL) (b) - (a)	% Funded Ratio (a) / (b)		Annual Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c)
January 1, 2010	$	1,868,805,569	$	2,300,542,572	$	431,737,003	81.23	$	368,334,524	117.21
January 1, 2011		1,894,740,077		2,473,704,487		578,964,410	76.60		367,639,226	157.48
January 1, 2012		1,869,656,263		2,617,862,133		748,205,870	71.42		383,801,802	194.95
January 1, 2013		1,854,871,487		2,909,019,272		1,054,147,785	63.76		375,687,978	280.59
January 1, 2014		1,995,112,935		3,124,079,563		1,128,966,628	63.86		373,848,113	301.99
December 31, 2014*		2,094,381,418		3,365,534,522		1,271,153,104	62.23		389,527,874	326.33
December 31, 2015*		2,154,874,311		3,553,200,981		1,398,326,670	60.65		404,303,585	345.86
December 31, 2016*		2,209,893,867		3,780,554,300		1,570,660,433	58.45		433,956,825	361.94
December 31, 2017*		2,288,265,169		3,956,724,359		1,668,459,190	57.83		460,564,650	362.26
December 31, 2018*		2,324,698,216		4,438,326,161		2,113,627,945	52.38		485,336,445	435.50

* For the regular actuarial valuation the City of Fort Worth requested the date be changed from 1/1 to 12/31 effective 1/1/2015 valuation.

Staff Plan

Actuarial Valuation Date		Actuarial Value of Assets (AVA) (a)		Actuarial Accrued Liability (AAL) (b)		Unfunded Actuarial Accrued Liability (UAAL) (b) - (a)	% Funded Ratio (a) / (b)		Annual Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b)-(a)]/(c)
January 1, 2010	$	545,682	$	973,794	$	428,112	56.04	$	1,132,034	37.82
January 1, 2011		835,377		1,287,145		451,768	64.90		1,103,369	40.94
January 1, 2012		1,180,511		1,930,294		749,783	61.16		1,547,810	48.44
January 1, 2013		1,596,824		1,924,028		327,204	82.99		1,467,047	22.30
January 1, 2014		2,286,404		2,327,578		41,174	98.23		1,293,628	3.18
December 31, 2014*		2,850,030		3,843,480		993,450	74.15		1,541,518	64.45
December 31, 2015*		3,363,797		4,563,466		1,199,669	73.71		1,639,398	73.18
December 31, 2016*		3,878,837		5,072,901		1,194,064	76.46		1,476,583	80.87
December 31, 2017*		4,533,706		5,874,460		1,340,754	77.18		1,582,239	84.74
December 31, 2018*		5,189,502		7,531,496		2,341,994	68.90		1,494,667	156.69

* For the regular actuarial valuation the City of Fort Worth requested the date be changed from 1/1 to 12/31 effective 1/1/2015 valuation.

Development of Actuarial Value of Assets – City Plan

As of December 31, 2018

1	Fair Value of Assets at December 31, 2017	$	2,323,717,570
2	Net New Investments		
	A. Contributions		132,161,539
	B. Disbursements		(227,700,254)
	C. Subtotal	$	(95,538,715)
3	Fair Value of Assets at the end of year	$	2,147,041,319
4	Net Earnings (3-1-2c)		(81,137,536)
5	Assumed Rate of Return		7.75%
6	Expected Return		176,385,986
7	Excess Return		(257,523,522)
8	Excess Return on Assets for last four years		

Period End	Remaining Deferrals of Excess(Shortfall) Return (1)	Offsetting of Gains/(Losses) (2)	Net Deferrals Remaining (3)	Years Remaining (4)	Recognized for this Valuation	Net Deferrals Remaining (3)
December 31, 2014	$ (13,087,444)	$ 13,087,444		1		
December 31, 2015	(67,840,193)	67,840,193		2		
December 31, 2016	3,451,237	(3,451,237)		3		
December 31, 2017	112,928,801	(112,928,801)		4		
December 31, 2018	(257,523,522)	35,452,401	(222,071,121)	5	(44,414,224)	(177,656,897)
Total	$ (222,071,121)	$ -	$ (222,071,121)		$ (44,414,224)	$ (177,656,897)

9	Preliminary Actuarial Value of Assets (3-8)	$	2,324,698,216
10	80 Percent of Fair Value		1,717,633,056
11	120 Percent of Fair Value		2,576,449,582
12	Actuarial Value of Assets (9 not less than 10 or greater than 11)	$	2,324,698,216
13	Actuarial Value as a percentage of Fair Value		108.3%
14	Estimated Actuarial Value Yield		5.9%

Development of Actuarial Value of Assets – Staff Plan

As of December 31, 2018

1	Fair Value of Assets at December 31, 2017	$	4,768,637
2	Net New Investments		
	A. Contributions		380,710
	B. Disbursements		(39,548)
	C. Subtotal	$	341,162
3	Fair Value of Assets at the end of year	$	4,916,880
4	Net Earnings (3-1-2c)		(192,919)
5	Assumed Rate of Return		7.75%
6	Expected Return		382,789
7	Excess Return		(575,708)
8	Excess Return on Assets for last four years		

Period End	Remaining Deferrals of Excess(Shortfall) Return	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this Valuation	Net Deferrals Remaining
	(1)	(2)	(3)	(4)		(3)
December 31, 2014	$ (16,995)	$ 16,995		1	-	-
December 31, 2015	(124,689)	124,689		2	-	-
December 31, 2016	9,979	(9,979)		3	-	-
December 31, 2017	366,636	(366,636)		4	-	-
December 31, 2018	(575,708)	234,931	(340,777)	5	(68,155)	(272,622)
	$ (340,777)	$ -	$ (340,777)		$ (68,155)	$ (272,622)

9	Preliminary Actuarial Value of Assets (3-8)	$	5,189,502
10	80 Percent of Fair Value		3,933,504
11	120 Percent of Fair Value		5,900,256
12	Actuarial Value of Assets (9 not less than 10 or greater than 11)	$	5,189,502
13	Actuarial Value as a percentage of Fair Value		105.5%
14	Estimated Actuarial Value Yield		6.7%

Actuarial Gain or Loss

For Year Ended December 31, 2018

		% of AAL		CITY PLAN	% of AAL		STAFF PLAN
A	**CALCULATION OF TOTAL ACTUARIAL GAIN OR LOSS**			**CITY PLAN**			**STAFF PLAN**
1	Unfunded Actuarial Accrued Liability (UAAL) for prior year		$	1,668,459,190		$	1,340,754
2	Normal cost for the year (excluding administrative expenses)			56,190,487			274,993
3	Actual administrative expenses			4,966,122			22,407
4	Actual contributions during the year		$	(132,161,539)		$	(380,710)
5	Interest at 7.75%						
	a On UAAL		$	129,305,587		$	103,908
	b On normal cost			2,369,819			11,524
	c On contributions			(5,121,260)			(14,753)
	d Total		$	126,554,146		$	100,679
6	Assumption Change (Gains)/Losses			509,854,152			986,994
7	Plan Changes			(144,328,680)			(534,547)
8	Expected UAAL			2,089,533,878			1,810,570
9	Actual UAAL			2,113,627,945			2,341,994
10	Total (Gain)/Loss for the year		$	24,094,067		$	531,424
B	**SOURCE OF GAINS AND LOSSES**	% of AAL			% of AAL		
11	Asset (Gain)lLoss for the year	0.94%	$	41,666,663	0.66%	$	49,948
12	Pay Increases (Less)/Greater than expected	0.30%		13,323,823	6.79%		511,071
13	Non-Retired Demographic (Gains)/Losses	0.01%		581,460	1.03%		(77,766)
14	Post-Retirement Mortality (Gains)/Losses	0.15%		(6,482,635)	0.04%		(3,034)
15	Other (Gains)/Losses	0.56%		(24,995,244)	0.68%		51,205
16	Total (Sum of Items 11 through 15)	0.54%	$	24,094,067	7.06%	$	531,424

Analysis of Normal Cost by Component

As of December 31, 2018 and December 31, 2017

	City Plan		Staff Plan	
	2018	**2017**	**2018**	**2017**
Gross Normal Cost				
Retirement Benefits	12.96%	10.22%	13.94%	11.57%
Termination Benefits	2.74%	2.20%	5.94%	5.60%
Death Benefits	0.19%	0.22%	0.16%	0.21%
Disability Benefits	0.08%	0.06%	0.00%	0.00%
Totals	15.97%	12.70%	20.04%	17.38%

Retirees, Beneficiaries, and Disabled Participants Added to and Removed from Rolls

City Plan

Valuation Date	ADDED TO ROLLS Number	ADDED TO ROLLS Annual Allowances	REMOVED FROM ROLLS Number	REMOVED FROM ROLLS Annual Allowances	ROLLS-END OF YEAR Number	ROLLS-END OF YEAR Annual Allowances	% Increase in Annual Allowances	Average Annual Allowances
January 1, 2009	248	$ 9,350,372	148	$ 2,998,471	3,304	$ 99,516,480	9.7%	$ 30,120
January 1, 2010	238	8,153,702	93	1,824,382	3,449	106,656,876	7.2%	30,924
January 1, 2011	177	6,137,781	109	2,411,705	3,517	110,382,952	3.5%	31,386
January 1, 2012	224	8,762,512	105	2,317,797	3,636	117,798,072	6.7%	32,398
January 1, 2013	218	8,738,413	148	3,282,570	3,706	125,983,212	6.9%	33,994
January 1, 2014	274	11,046,752	160	3,648,176	3,820	134,496,892	6.8%	35,209
December 31, 2014*	246	10,347,634	160	3,619,256	3,906	143,316,261	6.6%	36,691
December 31, 2015*	259	10,091,083	123	3,230,266	4,042	152,284,728	6.3%	37,676
December 31, 2016*	325	15,697,903	115	2,430,574	4,252	167,629,136	9.9%	39,353
December 31, 2017*	238	11,397,587	99	2,334,641	4,391	178,611,771	6.7%	40,677
December 31, 2018*	283	13,192,872	91	2,299,308	4,583	191,775,783	7.4%	41,845

* For the regular actuarial valuation the City of Fort Worth requested the date be changed from 1/1 to 12/31 effective with 1/1/2015 valuation.

Staff Plan

Valuation Date	ADDED TO ROLLS Number	ADDED TO ROLLS Annual Allowances	REMOVED FROM ROLLS Number	REMOVED FROM ROLLS Annual Allowances	ROLLS-END OF YEAR Number	ROLLS-END OF YEAR Annual Allowances	% Increase in Annual Allowances	Average Annual Allowances
December 31, 2018*	1	$ 4,355	-	-	1	$ 4,355		$ 4,355

*The Fort Worth Employees' Retirement Fund Staff Plan had its first retiree in calendar year 2018.

Solvency Test

December 31, 2018

	AGGREGATED ACCRUED LIABILITIES				PORTIONS OF ACCRUED LIABILITIES COVERED BY REPORTED ASSETS		
Valuation Date	Active and Inactive Members Contributions	Retirees and Beneficiaries	Active/Inactive Members (Employers Financed Portion)	Reported Assets			
(1)	(2)	(3)	(4)	(5)	(5)/(2)	{(5)-(2)}/(3)	{(5)-(2)}-(3)/(4)
CITY PLAN							
January 1, 2009	$ 318,715,416	$ 955,810,867	$ 917,601,899	$ 1,596,392,591	100%	100%	35%
January 1, 2010	342,958,419	1,029,395,076	928,189,077	1,868,805,569	100%	100%	53%
January 1, 2011	431,035,581	1,071,668,304	971,000,602	1,894,740,077	100%	100%	40%
January 1, 2012	461,684,282	1,157,940,326	998,237,525	1,869,656,263	100%	100%	25%
January 1, 2013	499,028,022	1,288,418,634	1,121,572,616	1,854,871,487	100%	100%	6%
January 1, 2014	529,079,160	1,469,007,750	1,125,992,653	1,995,112,935	100%	100%	0%
December 31, 2014**	554,657,382	1,579,267,555	1,231,609,585	2,094,381,418	100%	97%	0%
December 31, 2015**	589,185,131	1,713,648,693	1,250,367,157	2,154,874,311	100%	91%	0%
December 31, 2016**	505,886,072	1,912,833,490	1,361,834,738	2,209,893,867	100%	89%	0%
December 31, 2017**	522,640,298	2,056,348,215	1,377,735,846	2,288,265,169	100%	86%	0%
December 31, 2018**	522,128,181	2,492,013,634	1,424,184,346	2,324,698,216	100%	72%	0%
STAFF PLAN							
January 1, 2009	$ 78,773	$ -	$ 666,417	$ 257,381	100%	100%	27%
January 1, 2010	212,334	-	761,460	545,682	100%	100%	44%
January 1, 2011	471,865	-	815,280	835,377	100%	100%	45%
January 1, 2012	729,086	-	1,201,208	1,180,511	100%	100%	38%
January 1, 2013	863,597	-	1,060,431	1,596,824	100%	100%	69%
January 1, 2014*	1,206,532	-	1,121,046	2,286,404	100%	100%	96%
December 31, 2014**	1,378,942	-	2,464,538	2,850,030	100%	100%	60%
December 31, 2015**	1,551,657	-	3,011,809	3,363,797	100%	100%	60%
December 31, 2016**	1,711,324	-	3,361,577	3,878,837	100%	100%	64%
December 31, 2017**	2,000,288	-	3,874,172	4,533,706	100%	100%	65%
December 31, 2018**	2,184,114	56,334	5,291,048	5,189,502	100%	100%	56%

*Member contributions are greater than Employer contributions due to employee service purchase.

** For the regular actuarial valuation, the City of Fort Worth requested the date be changed from 1/1 to 12/31 effective with 1/1/2015 valuation.

Distribution of Active Members by Age and Years of Service - City Plan

As of December 31, 2018

Years of Service Attained Age	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
	Number and Average Comp									
Under 25	135	-	-	-	-	-	-	-	-	135
	46,613	-	-	-	-	-	-	-	-	46,613
25-29	451	83	3	-	-	-	-	-	-	537
	58,692	70,110	64,030	-	-	-	-	-	-	60,487
30-34	437	242	147	4	-	-	-	-	-	830
	60,074	78,242	82,474	60,625	-	-	-	-	-	69,341
35-39	365	194	292	119	2	-	-	-	-	972
	61,513	76,205	84,119	89,583	56,941	-	-	-	-	74,664
40-44	206	142	207	210	76	-	-	-	-	841
	60,592	71,712	83,119	94,595	92,024	-	-	-	-	79,345
45-49	204	111	173	218	235	55	2	-	-	998
	60,843	66,260	73,823	92,608	107,051	103,655	130,812	-	-	84,014
50-54	189	90	153	136	218	146	38	4	-	974
	58,648	58,748	66,915	84,543	97,589	108,393	102,662	110,081	-	81,672
55-59	125	75	124	92	156	90	59	3	-	724
	60,267	61,730	61,487	74,843	87,181	97,594	109,862	98,512	-	77,119
60-64	81	65	95	65	60	26	10	5	4	411
	53,292	59,919	61,981	68,396	83,067	90,036	99,028	109,144	135,111	67,997
Over 64	32	27	45	33	18	7	3	2	-	167
	57,548	64,767	58,176	74,078	97,157	65,282	89,163	110,314	-	67,944
Total Number	2,225	1,029	1,239	877	765	324	112	14	4	6,589
Average Comp	$ 58,938	$ 70,589	$ 75,241	$ 86,921	$ 96,565	$ 102,184	$ 106,271	$ 107,301	$ 135,111	$ 74,997

Historical Active Participant Data

City Plan

Valuation Date	Active Count	Average Age	Average Service	Covered Payroll *	Average Salary	Percent Change
1/1/2010	6,277	43.3	10.7	368.335	$ 58,680	0.4%
1/1/2011	6,144	43.7	10.9	367.639	59,837	2.0%
1/1/2012	6,281	43.9	10.9	383.802	61,105	2.1%
1/1/2013	6,278	44.3	11.2	375.688	61,204	0.2%
1/1/2014	6,199	44.5	11.4	373.848	60,308	-1.5%
12/31/2014**	6,198	44.6	11.4	389.528	62,847	4.2%
12/31/2015**	6,280	44.6	11.3	404.304	64,380	2.4%
12/31/2016**	6,414	44.3	11.1	415.728	64,816	0.7%
12/31/2017**	6,579	44.1	10.8	442.445	67,251	3.8%
12/31/2018**	6,589	44.2	10.7	494.152	74,997	11.5%

*Covered payroll in millions.
**The City of Fort Worth requested a change in the date of the evaluation from 1/1/2015 to 12/31/2014.

Staff Plan

Valuation Date	Active Count	Average Age	Average Service	Covered Payroll	Average Salary	Percent Change
1/1/2010	14.0	36.6	4.6	1,132,034	$ 80,860	1.5%
1/1/2011	14.0	43.0	5.1	1,103,369	78,812	-2.5%
1/1/2012	19.0	44.7	6.0	1,547,810	81,464	3.4%
1/1/2013	19.0	47.4	6.8	1,467,047	77,213	-5.2%
1/1/2014	18.0	47.8	7.9	1,293,628	71,868	-6.9%
12/31/2014*	19.0	49.3	8.5	1,541,518	81,133	12.9%
12/31/2015*	19.0	47.2	8.7	1,639,398	86,284	6.3%
12/31/2016*	18.0	49.2	9.4	1,476,583	82,032	-4.9%
12/31/2017*	18.0	51.3	9.8	1,582,239	87,902	7.2%
12/31/2018*	16.0	46.8	10.2	1,494,667	93,417	6.3%

*The City of Fort Worth requested a change in the date of the evaluation from 1/1/2015 to 12/31/2014.

STATISTICAL SECTION

Casa Mañana

Statistical Information Overview

The objective of the Statistical Section is to provide financial statement users with additional historic perspective, context, and detail to assist in using the information in the Basic Financial Statements, Notes to the Basic Financial Statement, Required Supplementary Information, and Other Supplementary Information to understand and assess the Fund's economic condition. The information contained in the statistical section is divided into two distinct sections, financial trends and participant information. All information was derived from Audited Annual Financial Statements and/or our Benefit Administration System.

Financial Trends

The Financial trends section is intended to assist readers in understanding how the Fund's financial position has changed over time. The Changes in Plan Net Position for the last ten fiscal years presents additions by source, deductions by type, and total change in plan net position for each year. Additions to net position include member and city contributions. In addition to contributions, additions also include earnings for the Fund's investment activities. Deductions from Net Position are primarily benefit payments and refunds paid to participants.

Participant Data

Participant data can be found following the financial data in this section. The schedules include data on member population, age, years of service, and various levels of benefit payment analysis.

Schedule of Changes in Plan Net Position – City Plan

	2019	2018	2017	2016	2015
Additions					
Employee Contributions	$ 40,634,725	$ 37,618,303	$ 35,963,200	$ 33,977,411	$ 32,541,773
Employer Contributions	113,109,911	93,504,064	89,408,134	84,746,991	80,820,598
Investment Income	67,729,548	145,408,403	250,912,773	166,305,791	(20,635,550)
Total Additions to Plan Net Position	$ 221,474,184	$ 276,530,770	$ 376,284,107	$ 285,030,193	$ 92,726,821
Deductions					
Retirement	$ 171,687,119	$ 160,170,170	$ 149,317,259	$ 136,814,999	$ 127,146,361
Disability	5,261,167	5,285,218	5,324,746	5,349,863	5,400,724
Survivors	17,899,384	17,231,458	16,706,717	16,447,307	15,746,605
DROP Payouts	25,734,915	28,978,582	21,871,121	21,903,824	13,397,352
Actuarial Equivalent	920,891	875,608	1,548,691	1,524,938	1,369,546
Refund of Contributions					
Separation*	5,517,169	4,439,624	3,793,510	3,618,760	3,952,620
Death*	218,439	821,036	49,555	160,187	52,747
Depreciation	122,282	107,178	114,971	113,526	143,219
Administrative Expenses	5,585,108	4,808,157	4,752,442	4,649,611	3,823,331
Total Deductions from Plan Net Position	232,946,474	222,717,031	203,479,012	190,583,015	171,032,505
Total Change in Plan Net Position	(11,472,290)	53,813,739	172,805,095	94,447,178	(78,305,684)
Net Position September 30	$ 2,312,863,285	$ 2,324,335,575	$ 2,270,521,836	$ 2,097,716,741	$ 2,003,269,563

	2014	2013	2012	2011	2010
Additions					
Employee Contributions	$ 31,929,289	$ 33,633,645	$ 32,715,940	$ 32,039,181	$ 31,544,616
Employer Contributions	78,165,049	77,992,863	77,264,739	74,577,052	65,627,115
Investment Income	159,994,300	192,363,635	208,022,063	20,403,552	149,306,505
Total Additions to Plan Net Position	$ 270,088,638	$ 303,990,143	$ 318,002,742	$ 127,019,785	$ 246,478,236
Deductions					
Retirement	$ 118,458,335	$ 110,170,397	$ 102,819,849	$ 94,629,017	$ 87,567,730
Disability	5,320,505	5,477,370	5,648,866	5,673,945	5,663,538
Survivors	15,282,876	14,649,530	14,190,329	13,724,270	13,827,408
DROP Payouts	13,745,000	12,476,037	14,108,183	10,893,575	10,683,105
Actuarial Equivalent	3,260,271	947,258	1,022,189	1,231,860	1,778,068
Refund of Contributions					3,641,006
Separation*	4,953,166	3,936,920	3,763,795	3,290,425	-
Death*	138,447	58,463	262,294	233,303	-
Depreciation	130,935	143,945	139,428	136,033	113,526
Administrative Expenses	3,738,927	3,570,422	3,408,430	3,155,494	2,588,790
Total Deductions from Plan Net Position	165,028,462	151,430,342	145,363,363	132,967,922	125,863,171
Total Change in Plan Net Position	105,060,176	152,559,801	172,639,379	(5,948,137)	120,615,065
Net Position September 30	$ 2,081,575,247	$ 1,976,515,071	$ 1,823,955,270	$ 1,651,315,891	$ 1,657,264,028

* Segregation of refunds is not available prior to 2011.

Schedule of Changes in Plan Net Position – Staff Plan

	2019	2018	2017	2016	2015
Additions					
Employee Contributions	$ 127,207	$ 131,067	$ 124,339	$ 130,973	$ 126,984
Employer Contributions	241,316	250,059	237,224	249,881	242,270
Investment Income	170,225	303,812	500,246	286,116	(30,772)
Total Additions to Net Position	$ 538,748	$ 684,938	$ 861,809	$ 666,970	$ 338,482
Deductions					
Retirement	$ 55,314	$ 1,780	$ -	$ -	$ -
Disability	-	-	-	-	-
Survivors	-	-	-	-	-
DROP Payouts	140,214	-	-	-	-
Actuarial Equivalent	-	-	-	-	-
Refund of Contributions	-	-	-	-	-
Death	-	-	-	-	-
Separation		14,294	35,933	11,754	16,747
Depreciation	288	238	228	196	214
Administrative Expenses	54,161	27,725	14,760	27,374	5,702
Total Deductions from Plan Net Position	249,977	44,037	50,921	39,324	22,663
Total Change in Plan Net Position	288,771	640,901	810,888	627,646	315,819
Net Position September 30	$ 5,456,426	$ 5,167,655	$ 4,526,754	$ 3,715,866	$ 3,088,220

	2014	2013	2012	2011	2010
Additions					
Employee Contributions	$ 296,093	$ 122,316	$ 115,338	$ 92,129	$ 90,057
Employer Contributions	225,536	233,365	220,052	175,801	171,818
Investment Income	209,544	196,564	154,278	12,070	60,411
Total Additions to Net Position	$ 731,173	$ 552,245	$ 489,668	$ 280,000	$ 322,286
Deductions					
Retirement	$ -	$ -	$ -	$ -	$ -
Disability	-	-	-	-	-
Survivors	-	-	-	-	-
DROP Payouts	-	-	-	-	-
Actuarial Equivalent	-	-	-	-	-
Refund of Contributions	-	-	-	-	-
Death	-	-	8,270	-	-
Separation	-	-	16,791	25,294	230
Depreciation	172	147	114	85	54
Administrative Expenses	4,897	3,648	2,829	1,959	993
Total Deductions from Plan Net Position	5,069	3,795	28,004	27,338	1,277
Total Change in Plan Net Position	726,104	548,450	461,664	252,662	321,009
Net Position September 30	$ 2,772,401	$ 2,046,297	$ 1,497,847	$ 1,036,183	$ 783,521

Schedule of Revenue by Source

For the Ten Years Ended September 30

City Plan

Fiscal Year Ended	Member Contributions	Employer Contributions	Investment Income	Total Revenue
September 30, 2010	$ 31,544,616	$ 65,627,115	$ 149,306,505	$ 246,478,236
September 30, 2011	32,039,181	74,577,052	20,403,552	127,019,785
September 30, 2012	32,715,940	77,264,739	208,022,063	318,002,742
September 30, 2013	33,633,645	77,992,863	192,363,635	303,990,143
September 30, 2014	31,929,289	78,165,049	159,994,300	270,088,638
September 30, 2015	32,541,773	80,820,598	(20,635,550)	92,726,821
September 30, 2016	33,977,411	84,746,991	166,305,791	285,030,193
September 30, 2017	35,963,200	89,408,134	250,912,773	376,284,107
September 30, 2018	37,618,303	93,504,064	145,408,403	276,530,770
September 30, 2019	40,634,725	113,109,911	67,729,548	221,474,184

Staff Plan

Fiscal Year Ended	Member Contributions	Employer Contributions	Investment Income	Total Revenue
September 30, 2010	$ 90,057	$ 171,818	$ 60,411	$ 322,286
September 30, 2011	92,129	175,801	12,070	280,000
September 30, 2012	115,338	220,052	154,278	489,668
September 30, 2013	122,316	233,365	196,564	552,245
September 30, 2014*	296,093	225,536	209,544	731,173
September 30, 2015	126,984	242,270	(30,772)	338,482
September 30, 2016	130,973	249,881	286,116	666,970
September 30, 2017	124,339	237,224	500,246	861,809
September 30, 2018	131,067	250,059	303,812	684,938
September 30, 2019	127,207	241,316	170,225	538,748

*Member contributions are greater than Employer contributions due to employee service purchase.

Membership Population

As of September 30

City Plan

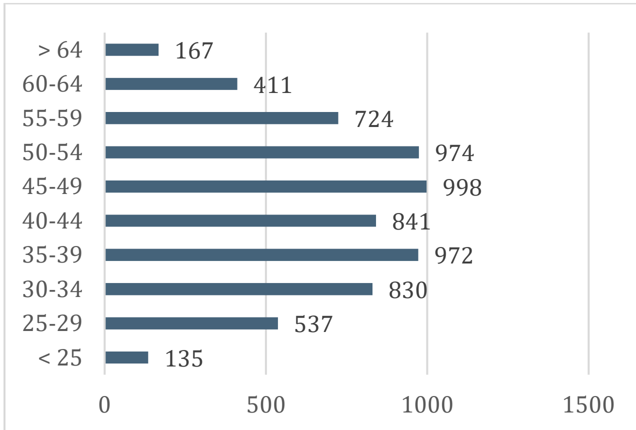
Year Ended	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
September 30, 2010	6,277	290	3,449	0.60
September 30, 2011	6,144	291	3,517	0.62
September 30, 2012	6,281	279	3,636	0.62
September 30, 2013	6,278	277	3,706	0.63
September 30, 2014	6,199	296	3,820	0.66
September 30, 2015	6,198	317	3,906	0.68
September 30, 2016	6,280	355	4,042	0.70
September 30, 2017	6,414	363	4,252	0.72
September 30, 2018	6,579	375	4,391	0.72
September 30, 2019	6,589	375	4,583	0.75

Staff Plan

Year Ended	Active Members	Vested Terminated Members	Retired Members and Beneficiaries	Ratio of Non-Actives to Actives
September 30, 2008	12	-	-	-
September 30, 2009	14	-	-	-
September 30, 2010	14	-	-	-
September 30, 2011	19	-	-	-
September 30, 2012	19	-	-	-
September 30, 2013	18	1	-	0.06
September 30, 2014	19	1	-	0.05
September 30, 2015	19	2	-	0.11
September 30, 2016	18	3	-	0.17
September 30, 2017	18	5	-	0.28
September 30, 2018	16	7	1	0.50

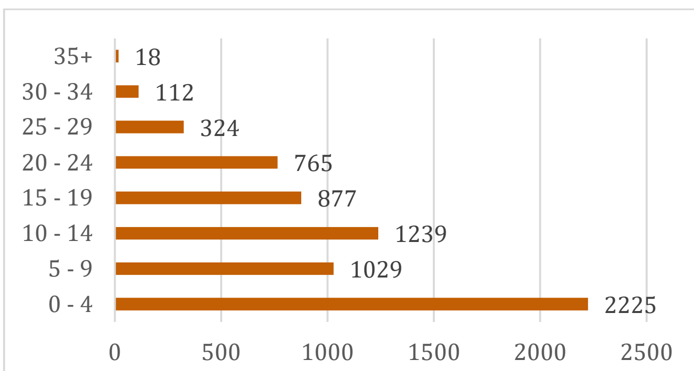
Distribution of Active Participants by Age

City Plan
as of December 31, 2018



Distribution of Active Participants by Service

City Plan
as of December 31, 2018



Distribution of Retired Members by Type of Benefits

City Plan

As of September 30, 2019

Amount of Monthly Benefit	Number of Retirees	Type of Retirement				
		1	2	3	4	5
$ 1 - 500	223	66	18	105	9	25
$ 501 - 1,000	433	111		273	14	35
$ 1,001 - 1,500	438	113	1	268	31	25
$ 1,501 - 2,000	409	98		263	38	10
$ 2,001 - 2,500	445	100		293	41	11
$ 2,501 - 3,000	375	79		279	14	3
$ 3,001 - 3,500	329	52		253	20	4
$ 3,501 - 4,000	304	34		248	19	3
$ 4,001 - 4,500	247	31		210	6	-
$ 4,501 - 5,000	233	13		217	3	-
$ 5,001 - 5,500	216	7		209	-	-
$ 5,501 - 6,000	198	3		194	-	1
$ 6,001 - 6,500	185	5		178	2	-
$ 6,501 - 7,000	146	2		144	-	-
Over $7,000	402	1		401	-	-
	4,583	715	19	3,535	197	117

1 - Surviving Spouse
2 - Dependent Child
3 - Regular Retirement
4 - Disability Retirement
5 - QDRO/Alternate Payee

Schedule of Average Benefit Payments by Years of Service and Final Average Salary – City

Retirement Effective Dates	Years of Credited Service						
	0-4	5-9	10-14	15-19	20-24	25-29	30+
Period 01/01/2011 to 12/31/2011							
*Average Monthly Benefits	0	$838	$1,233	$1,942	$3,758	$5,311	$6,172
Average Final Salary	0	**	**	**	**	**	**
Number of Active Retirees	0	26	15	22	36	64	15
Period 01/01/2012 to 12/31/2012							
*Average Monthly Benefits	0	$655	$1,182	$2,405	$3,567	$5,439	$5,410
Average Final Salary	0	**	**	**	**	**	**
Number of Active Retirees	0	16	13	16	31	64	21
Period 01/01/2013 to 12/31/2013							
*Average Monthly Benefits	0	$873	$1,222	$2,536	$3,645	$5,439	$6,185
Average Final Salary	0	**	**	**	**	**	**
Number of Active Retirees	0	26	23	28	32	78	24
Period 01/01/2014 to 12/31/2014							
*Average Monthly Benefits	0	$770	$1,492	$2,251	$4,146	$5,800	$6,047
Average Final Salary	0	$49,262	$48,382	$53,096	$69,814	$83,750	$76,030
Number of Active Retirees	0	36	20	26	22	75	22
Period 01/01/2015 to 12/31/2015							
*Average Monthly Benefits	0	$864	$1,602	$2,263	$3,261	$5,679	$6,312
Average Final Salary	0	$58,356	$55,376	$54,451	$58,034	$80,967	$72,302
Number of Active Retirees	0	29	20	39	26	74	13
Period 01/01/2016 to 12/31/2016							
*Average Monthly Benefits	0	$760	$1,744	$2,297	$3,551	$5,941	$6,909
Average Final Salary	0	$45,589	$61,381	$60,057	$65,422	$83,454	$85,556
Number of Active Retirees	0	26	29	29	33	108	24
Period 01/01/2017 to 12/31/2017							
*Average Monthly Benefits	0	$1,099	$1,184	$2,302	3,903	$6,110	$6,576
Average Final Salary	0	$54,331	$47,988	$57,059	$70,913	$90,146	$80,756
Number of Active Retirees	0	10	30	37	41	83	16
Period 01/01/2018 to 12/31/2018							
*Average Monthly Benefits	0	$777	$1,518	$2,240	3,538	$6,584	$7,198
Average Final Salary	0	$52,255	$59,151	$58,463	$63,532	$91,902	$88,223
Number of Active Retirees	0	27	28	45	47	90	21

* Monthly benefits are actual benefits received during first year of retirement. These benefits may be higher than initial benefit for those that received COLAs while in DROP or converted DROP balance to a monthly annuity. Balances may be reduced for those that took a lump sum actuarial equivalent or elected a survivor option at the time of retirement.

** Final Average Salary not available for previous years, history will be built during future financial statements.

Schedule of Average Benefit Payments by Years of Service and Final Average Salary – Staff

Retirement Effective Dates	Years of Credited Service		
	0-5	6-15	16-25
Period 01/01/2019 to 12/31/2019			
*Average Monthly Benefits	0	$4,816	0
Average Final Salary	0	$146,515	0
Number of Active Retirees	0	3	0

* Monthly benefits are actual benefits received during first year of retirement. These benefits may be higher than initial benefit for those that received COLAs while in DROP or converted DROP balance to a monthly annuity. Balances may be reduced for those that took a lump sum actuarial equivalent or elected a survivor option at the time of retirement.

Since the Staff plan was separated from the City plan in 2007 some members are in both the City Plan and the Staff Plan. This represents only the years as part of the staff plan and the benefit paid by the staff plan. The portion attributed to the City plan is counted under the amounts reported for the City plan.

Schedule of Benefits by Type

City Plan

September 30

Fiscal Year Ended	Retirement Benefits	Actuarial Equivalent	Disability Benefits	Survivor Benefits	DROP Payments	Total Benefits
September 30, 2010	$ 87,567,730	$ 1,778,068	$ 5,663,538	$ 13,827,408	$ 10,683,105	$ 119,519,849
September 30, 2011	94,629,017	1,231,860	5,673,945	13,724,270	10,893,575	126,152,667
September 30, 2012	102,819,849	1,022,189	5,648,866	14,190,329	14,108,183	137,789,416
September 30, 2013	110,170,397	947,258	5,477,370	14,649,530	12,476,037	143,720,592
September 30, 2014	118,458,335	3,260,271	5,320,505	15,282,876	13,745,000	156,066,987
September 30, 2015	127,146,361	1,369,546	5,400,724	15,746,605	13,397,352	163,060,588
September 30, 2016	136,814,999	1,524,938	5,349,863	16,447,307	21,903,824	182,040,931
September 30, 2017	149,317,259	1,548,691	5,324,746	16,706,717	21,871,121	194,768,534
September 30, 2018	160,170,170	875,608	5,285,218	17,231,458	28,978,582	212,541,036
September 30, 2019	171,687,119	920,891	5,261,167	17,899,384	25,734,915	221,503,476

Staff Plan

September 30

Fiscal Year Ended	Retirement Benefits	Actuarial Equivalent	Disability Benefits	Survivor Benefits	DROP Payments	Total Benefits
September 30, 2018	$ 1,780	$ -	$ -	$ -	$ -	$ 1,780
September 30, 2019	55,314	-	-	-	140,214	195,528

Schedule of Average Benefit Payment Amounts

City Plan

September 30

As of Date	Number of Retirees Receiving Benefits	Benefits Paid During the Year	Average Monthly Benefit
September 30, 2010	3,449	$ 119,519,849	$ 2,888
September 30, 2011	3,517	126,152,667	2,989
September 30, 2012	3,636	137,789,416	3,158
September 30, 2013	3,706	143,720,592	3,232
September 30, 2014	3,820	156,066,987	3,405
September 30, 2015	3,906	163,060,588	3,479
September 30, 2016	4,042	182,040,931	3,753
September 30, 2017	4,252	194,768,534	3,817
September 30, 2018	4,391	212,541,036	4,034
September 30, 2019	4,583	221,503,476	4,028

Staff Plan

September 30

As of Date	Number of Retirees Receiving Benefits	Benefits Paid During the Year	Average Monthly Benefit
September 30, 2018	1	$ 1,780	$ 356
September 30, 2019	4	195,528	3,703

FORT WORTH EMPLOYEES' RETIREMENT FUND