

Retirement Plan for the Employees' Retirement Fund of the City of Dallas

Actuarial Valuation Report
as of December 31, 2019





June 1, 2020

Board of Trustees
Employees' Retirement Fund of the City of Dallas
1920 McKinney Avenue
10th Floor
Dallas, Texas 75201

Dear Members of the Board:

We are pleased to present our report of the actuarial valuation of the Employees' Retirement Fund of the City of Dallas ("ERF" or the "Fund") as of December 31, 2019.

This valuation provides information on the funding status of ERF. It includes a determination of the actuarially calculated contribution rates for the 2020 calendar year. In addition, it also contains the information necessary to determine the current total obligation rate and the current adjusted total obligation rate for the fiscal year beginning October 1, 2020 per City Ordinance. This rate is a function of the previous year's adjusted total obligation rate, this year's actuarially calculated contribution rate, and the rate necessary to make the debt service payment on the previously issued pension obligation bonds for fiscal year 2021.

In addition, the report provides various summaries of the data. A separate report is issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67 and 68. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of December 31st, the last day of the ERF plan year. This report was prepared at the request of the Board and is intended for use by the ERF staff and those designated or approved by the Board. This report may be provided to parties other than ERF staff only in its entirety and only with the permission of the Board.

As authorized in Chapter 40A-4(a)(16) of the Dallas City Code, the actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary. An experience investigation was performed for the five year period ending December 31, 2019. As a result of that study, revised assumptions were adopted by the Board effective with the valuation as of December 31, 2019. We believe the assumptions are internally consistent, reasonable, and, where appropriate, based on the actual experience of the ERF. All of the assumptions and methods used in this valuation were selected in compliance with the Actuarial Standards of Practice. All actuarial assumptions and methods are described under Section P of this report.

The results of the actuarial valuation are dependent on 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. Due to the limited scope of this assignment, GRS did not perform an analysis of the potential range of such possible future differences. The actuarial calculations are intended to provide information for rational decision making. Other than the sensitivity analysis shown in Section L, this report does not include a more robust assessment of the future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

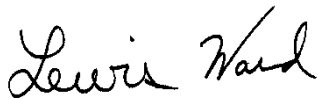
This report does not reflect the recent and still developing impact of the COVID-19 pandemic, which may significantly impact the demographic and economic experience occurring after this valuation date.

This valuation is based on the provisions of ERF in effect as of the valuation date, data on the ERF membership and information on the asset values of the Fund as of December 31, 2019. The member, annuitant and asset data used in the valuation were all prepared and furnished by ERF staff. While certain checks for reasonableness were performed, the data used was not audited.

To the best of our knowledge, this report is complete and accurate and was conducted in accordance with the Actuarial Standards of Practice as set forth by the Actuarial Standards Board and in compliance with the provisions of the Dallas City Code. The undersigned are independent actuaries and consultants. Mr. Randall is an Enrolled Actuary and a Member of the American Academy of Actuaries and he meets the Qualification Standards of the American Academy of Actuaries. Both Mr. Randall and Mr. Ward have significant experience in performing valuations for large public retirement systems.

We would like to thank the ERF staff for their assistance in providing all necessary information to complete this valuation. Their courteous help is very much appreciated. We look forward to discussing this actuarial valuation report with you at your convenience. Please do not hesitate to let us know if you have any questions or need additional information.

Respectfully submitted,



Lewis Ward
Consultant



Mark R. Randall, MAAA, FCA, EA
Chief Executive Officer



Table of Contents

	<u>Page</u>
Cover Letter	
Section A	Executive Summary 2
Section B	Purposes of the Actuarial Valuation..... 3
Section C	Report Highlights 4
Section D	Funding Process 5
Section E	Actuarial Contributions 6
Section F	Actuarial Assumptions..... 7
Section G	ERF Benefits 8
Section H	Experience During Previous Years 9
Section I	Asset Information 10
Section J	Funded Status 11
Section K	GASB Disclosure 12
Section L	Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions 13
Section M	Closing Comments..... 17
Section N	Actuarial Tables..... 18
Section O	Experience Tables..... 39
Section P	Actuarial Methods and Assumptions 47
Section Q	Summary of Benefit Provisions 56



EXECUTIVE SUMMARY

(\$ in 000s)

The key results from the actuarial valuation of the Employees' Retirement Fund of the City of Dallas as of December 31, 2019 may be summarized as follows:

	<u>December 31, 2018</u>	<u>December 31, 2019</u>
· Members		
- Actives	7,584	7,427
- Benefit recipients	7,224	7,405
- Deferred vested*	819	877
- Other terminated*	<u>673</u>	<u>789</u>
- Total	16,300	16,498
· Covered payroll (including overtime)	\$ 423,723	\$ 433,890
· Normal cost	\$ 81,299	\$ 87,509
as % of expected payroll	19.56%	20.50%
· Actuarial accrued liability	\$ 4,526,996	\$ 4,863,326
· Actuarial value of assets	\$ 3,620,319	\$ 3,682,959
· Market value of assets	\$ 3,265,402	\$ 3,658,088
· Unfunded actuarial accrued liability (UAAL)	\$ 906,677	\$ 1,180,367
· Estimated yield on assets (market value basis)	(5.15)%	17.30%
· Estimated yield on assets (actuarial value basis)	5.23%	6.74%
· Contribution Rates		
- Prior Adjusted Total Obligation Rate	36.00%	36.00%
- Current Total Obligation Rate	43.07%	43.92%
- Current Adjusted Total Obligation Rate	36.00%	36.00%
· Actuarial gains/(losses)		
- Assets	\$ (88,729)	\$ (35,798)
- Actuarial liability experience	\$ (11,356)	\$ 6,156
- Assumption and method changes	\$ -	\$ (205,391)
· 30-year level % of pay funding cost	\$ 146,729	\$ 157,348
as % of payroll (Employee + City)	34.59%	35.38%
· Funded ratio		
- Based on actuarial value of assets	80.0%	75.7%
- Based on market value of assets	72.1%	75.2%

* *Deferred vested are members who have applied for a deferred pension. Other terminations are other members who have terminated and still have contribution balances in the Fund.*



PURPOSES OF THE ACTUARIAL VALUATION

At your request, we have performed the actuarial valuation of the Employees' Retirement Fund of the City of Dallas ("ERF" or the "Fund") as of December 31, 2019.

The purposes of an actuarial valuation are as follows:

- To determine the funding status of ERF as of the valuation date;
- To develop the actuarially determined level of contributions for ERF for the 2020 calendar year; and
- To develop the current total obligation rate and the current adjusted total obligation rate for the fiscal year beginning October 1, 2020.

REPORT HIGHLIGHTS

(\$ in 000s)

The following is a set of key actuarial results from the prior year's valuation as compared to the current year:

	Valuation Date	
	December 31, 2018	December 31, 2019
Contribution Rates (% of Payroll)		
Normal Cost (including administrative expense)	20.95%	22.23%
Total Actuarial Contribution Rate	34.59%	35.38%
Total Projected Actuarial Contribution	\$146,729	\$157,348
Funded Status (on AVA basis)		
Actuarial Accrued Liability	\$4,526,996	\$4,863,325
Actuarial Value of Assets	3,620,319	3,682,959
Unfunded Actuarial Accrued Liability	\$906,677	\$1,180,366
Funded Ratio	79.97%	75.73%



FUNDING PROCESS

Based on the previous work of the Employees' Retirement Fund Study Committee, which was ratified by the ERF Board, the Dallas City Council and the voters of Dallas, a new funding process commenced October 1, 2005. From this date forward, a new "current adjusted total obligation rate" will be contributed jointly by the City (63%) and the Membership (37%). This current adjusted total obligation rate will cover both the debt service tied to the pension obligation bonds issued in 2005 and the contributions to the ERF. In subsequent years, the contribution rate changes only if the actuarial valuation develops a "current total obligation rate" which differs from the "prior adjusted total obligation rate" by more than 3.00% (plus or minus).

As shown in Section N – Table 3 and discussed later in this report, the "current total obligation rate" (Item 4 in Table 3) exceeds the "prior adjusted total obligation rate" (Item 1 in Table 3) as of December 31, 2019. This means that the "current adjusted total obligation rate" will remain at 36.00% of active member payroll for the fiscal year beginning October 1, 2020. It should be noted that under the contribution corridor methodology, the "current adjusted total obligation rate" would have been higher if not for the maximum rate of 36.00% allowed under Chapter 40A of the Dallas City Code.

ACTUARIAL CONTRIBUTIONS

As shown in Section N – Table 2, the Actuarially Required Contribution Rate developed in this actuarial valuation is 35.38% of active member payroll. This rate excludes the amount needed to make the City’s debt service payment on the pension obligation bonds in fiscal year 2021. This rate is the total level rate of pay (member + City) that would need to be contributed each of the next 30 years to pay off the unfunded liability of the Fund over that 30-year period. Note that because the total rate is assumed to remain level and the average normal cost as a percentage of pay is expected to decline over that time period (due to the new Tier B), the payment towards the unfunded liability as a percentage of pay is expected to increase over the 30-year period.

As shown in Section N -Table 3 of this report, the debt service payment is determined to be 8.54% of projected payroll. The sum of these rates is 43.92% (the Current Total Obligation Rate), which is 7.92% more than the Prior Adjusted Total Obligation Rate of 36.00%. Because the total contribution rate cannot exceed 36.00%, the total contribution rate in fiscal year 2021 (the Current Adjusted Total Obligation Rate) to fund the ERF and make the debt service payment on the pension obligation bonds will be 36.00%, which is the maximum rate allowed under Chapter 40A of the Dallas City Code.

The members contribute 37% of the Current Adjusted Total Obligation Rate and the City contributes 63%. Hence, the members’ portion of the 36.00% total contribution rate will be 13.32% and the City portion will be 22.68%. All of the member contribution rate will be contributed to the ERF. As noted above, 8.54% of the City’s contribution rate will go towards the debt service on the pension obligation bonds and the remaining 14.14% will be contributed towards the ERF. This means a total contribution rate of 27.46% will be contributed to the ERF, which compares to the actuarially calculated rate of 35.38%.

ACTUARIAL ASSUMPTIONS

Section P of this report includes a summary of the actuarial assumptions and methods used in this valuation. In short, costs are determined using the Entry Age Normal actuarial cost method. The assumed annual investment return rate is 7.25% and includes an annual assumed rate of inflation of 2.50%.

All actuarial assumptions and methods have been updated to reflect the five-year experience study recommendations that were adopted by the Board on May 22, 2020 to be effective with the December 31, 2019 actuarial valuation. Please see the experience study report dated June 2020 for a complete description of the new assumptions as well as the rationale for their selection. The adoption of the new actuarial assumptions increased the liabilities of the Fund by \$205 million.

Please see Section P of this report for a summary description of these assumptions and methods.

ERF BENEFITS

As the reader may be aware, City of Dallas voters approved a new tier of benefits for City of Dallas municipal employees hired after December 31, 2016.

There were no changes in the benefit provisions of ERF since the prior valuation. Please see Section Q for a summary description of the ERF benefits.

EXPERIENCE DURING PREVIOUS YEARS

An Actuarial (Gain)/Loss Analysis [(G)/L] reviews the effects of the actual experience that differs from the assumed experience based on the actual results for the year. If any difference increases assets or reduces liabilities, we have an actuarial gain. The reverse is an actuarial loss.

On a market value return basis, the Fund returned approximately 17.30% (calculated on a dollar-weighted basis, net of investment expenses). Given this return, the actual investment income was much higher than the expected investment income on the market value of assets; therefore, an investment excess occurred. However, because the prior year was a shortfall, the current year's excess income was offset dollar for dollar against the prior year shortfall. Please see Table 6 for the determination of the actuarial value of assets (AVA) and page 47 for a description of the AVA methodology. As developed on Table 9A, there was a \$35.8 million loss on the actuarial value of assets as of December 31, 2019. The rate of return on the actuarial value of assets for 2019 was 6.74% (calculated on a dollar-weighted basis, net of investment expenses). This result was less than the prior year's investment return assumption of 7.75%.

As developed on Table 8, ERF experienced an overall actuarial experience loss in calendar year 2019 in the amount of \$29.6 million. Since there was a \$35.8 million loss on the actuarial value of assets, this implies there was a liability actuarial gain of about \$6.2 million derived from demographic assumptions and non-investment economic assumptions (cost-of-living-adjustment). Please see Table 9B for an analysis of the experience loss by source.

The total (G)/L for the prior 5 years is broken down as follows (\$ in millions):

	2015	2016	2017	2018	2019
1) Actuarial (Gain)/Loss on Assets	\$31.24	(\$16.41)	(\$19.85)	\$88.73	\$35.80
2) Actuarial (Gain)/Loss on Liabilities	(26.83)	(32.35)	(61.02)	11.35	(6.16)
3) Total Actuarial (Gain) or Loss (1+2)	\$4.41	(\$48.76)	(\$80.87)	\$100.08	\$29.64

The unfunded actuarial accrued liability (UAAL) also increased \$30 million due to the shortfall between the calculated contribution rate and the actual contributions during 2019.



ASSET INFORMATION

The assets of the Fund (on a market value basis) increased from \$3,265 million as of December 31, 2018 to \$3,658 million as of December 31, 2019.

The assets recognized for actuarial valuation purposes (known as “the actuarial value of assets”) were equal to the market value of assets in the December 31, 2017 valuation. Beginning with the December 31, 2018 valuation, a new smoothing method is now being used to recognize future asset gains and losses. The purpose of such a smoothing method is to allow the use of market values, but to dampen the effect of the typical year-to-year market fluctuations. Please see page 47 of this report for a description of the new smoothing method (actuarial value of asset method). See Table 6 in Section N of this report for the determination of the actuarial value of assets as of December 31, 2019.

The actuarial value of assets has increased from \$3,620 million to \$3,683 million during 2019. The actuarial assets are less than the expected actuarial assets, \$3,719 million, due to recognition of the prior year’s deferred investment losses. This resulted in an actuarial loss on the actuarial assets of \$35.8 million.

The rate of return on investments for 2019 on the actuarial value of assets was 6.74%, compared to 5.23% in 2018. The detailed determinations of asset values utilized in this valuation and the change in assets in the last year are exhibited in Tables 4 and 5 of Section N of this report.

FUNDED STATUS

The funded status of ERF is measured by the Funded Ratio and the Unfunded Actuarial Accrued Liability (UAAL). The Funded Ratio is the ratio of the actuarial value of assets available for benefits to the actuarial accrued liability (AAL) of the Fund on the valuation date. Therefore, it reflects the portion of the AAL that is covered by ERF assets. The UAAL is the difference between these two amounts.

A Funded Ratio of 100% means that the funding of ERF is precisely on schedule as of the particular valuation date. In addition, an increasing funded ratio from year-to-year may also mean that the funding of ERF is on schedule. By monitoring changes in the Funding Ratio each year, we can determine whether or not funding progress is being made.

Based on the market value of assets, the Funded Ratio of ERF increased from 72.1% as of December 31, 2018 to 75.2% as of December 31, 2019. Based on the actuarial value of assets, the Funded Ratio of ERF decreased from 80.0% as of December 31, 2018 to 75.7% as of December 31, 2019.

The UAAL increased from \$906.7 million as of December 31, 2018 to \$1180.4 million as of December 31, 2019. Since the UAAL is positive, this implies the actuarial accrued liabilities exceed the actuarial assets of the Fund as of December 31, 2019.

The primary reason for the increase in the UAAL and the decrease in the funded ratio was the adoption of new actuarial assumptions, including the decrease in the investment return assumption from 7.75% to 7.25%. The recognition of prior year's deferred investment losses and the shortfall between the actuarially determined contribution rate and the actual contribution rate were also contributing factors.

GASB DISCLOSURE

Governmental Accounting Standards Board (GASB) Statement Numbers 67 and 68 detail the current accounting standards for ERF and the Fund's sponsor, the City of Dallas, Texas. These new standards were effective with the plan year ending December 31, 2014 for the Fund and the fiscal year ending September 30, 2015 for the City. The new standards created a clear distinction between the funding requirements of a pension plan and the accounting requirements. Because of these changes, the GASB disclosure information will no longer be included in the actuarial valuation report, but will instead be provided under separate cover.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (Continued)

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The Current Adjusted Total Obligation Rate shown in the Executive Summary may be considered as a minimum contribution rate that complies with Chapter 40A of the Dallas City Code. However, due to the contribution rate cap, this is less than the actuarially calculated rate. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Several generally accepted plan maturity measures are described below and are followed by a table showing a 10-year history of the measurements for Dallas ERF.

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (Continued)

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees, resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives, resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

DURATION OF PRESENT VALUE OF BENEFITS

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

ADDITIONAL RISK ASSESSMENT

Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. While a robust measurement of additional risk assessment is outside the scope of the annual actuarial valuation, we have included a scenario test of a 1% increase or 1% decrease in the investment return assumption. The results of this test are shown at the end of this section.

Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (Continued)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Ratio of the market value of assets to total payroll	8.43	7.71	8.55	8.13	8.12	9.34	9.72	9.01	8.87	8.90
Ratio of actuarial accrued liability to payroll	11.21	10.68	10.39	10.48	10.50	11.03	10.55	10.64	10.95	10.18
Ratio of actives to retirees and beneficiaries	1.00	1.05	1.11	1.10	1.11	1.09	1.08	1.09	1.09	1.17
Ratio of net cash flow to market value of assets	-4.8%	-5.1%	-4.3%	-4.4%	-4.5%	-4.2%	-4.4%	-5.1%	-5.3%	-4.6%
Duration of the actuarial present value of benefits*	12.84	12.37	NA	NA	NA	NA	NA	NA	NA	NA

*Duration measure not available prior to 2018

Impact on Funding Metrics of Investment Return Assumption +/- 1%

Cost Item	Investment Return Assumption		
	6.25%	7.25%	8.25%
Normal Cost % (excluding admin expenses)	25.35%	20.50%	16.84%
UAAL (\$ in millions)	\$1,765.1	\$1,180.4	\$695.4
30-year funding rate (employee + City)	44.46%	35.38%	26.40%
Funded Ratio	67.60%	75.73%	84.12%
Funding Period	Infinite	65 years	23 years



CLOSING COMMENTS

The unfunded actuarial accrued liability of the Fund has increased since the prior valuation primarily due to the adoption of the new actuarial assumptions including the lowering of the investment return assumption to 7.25%.

The calculated contribution rate necessary to pay the Fund's normal cost and amortize the UAAL over 30 years is 35.38% of pay. When the debt service payment on the Pension Obligation Bonds is considered, the total contribution rate is 43.92% of payroll. However, Chapter 40A of the Dallas City Code limits the contribution rate to 36.00% of payroll, therefore, the total rate to be contributed by the employees and the City for fiscal year 2019 will be 36.00% of pay.

Additionally, the calculated contribution rate is above the 36.00% of pay maximum. When the Pension Obligation Bond debt is repaid, the calculated contribution rate is expected to drop between 8.50% - 9.00% of pay. However, that is not expected to happen until fiscal year 2035.

Following adoption of the proposed changes by the ERF Board, the Dallas City Council, and approval by the City of Dallas voters, the new tier of benefits became effective for employees hired after December 31, 2016 and the outlook for the ERF improved. Based on our projections, reflecting the new tier of benefits and assuming the actuarial assumptions are exactly met (including a 7.25% return on the actuarial value of assets), ERF is expected to be fully funded in approximately 65 years.

ACTUARIAL TABLES

Table Number	Content of Tables	Page
1	Summary of Actuarial Values	19
2	Demonstration of Actuarially Required Contribution Rate for FY 2021	20
3	Information for City Ordinance 25695	21
4	Net Assets Available for Benefits	25
5	Change in Assets Available for Benefits	26
6	Development of Actuarial Value of Assets	27
7	Historical Investment Performance	28
8	Analysis of Change in Unfunded Actuarial Accrued Liability	29
9a	Investment Experience (Gain) or Loss	30
9b	Analysis of Actuarial (Gains) and Losses for 2019	31
10	Schedule of Funding Status	32
11	Summary of Data Characteristics	33
12	Distribution of Active Members and Payroll by Age and Years of Service	34
13	Distribution of Benefit Recipients	35
14a	Schedule of Active Member Valuation Data	36
14b	Schedule of Retirees and Beneficiaries Added to and Removed from Rolls	37
14c	Solvency Test	38

Summary of Actuarial Values
As of December 31, 2019
(\$ in 000s)

	<u>Entry Age Actuarial Values</u>			
	APV* of Projected Benefits	Actuarial Accrued Liability (AAL)	Normal Cost \$	Normal Cost % of Pay**
1 Active Members				
a. Retirement	\$ 1,917,069	\$ 1,460,755	\$ 63,862	14.96%
b. Death	18,931	11,437	1,037	0.25%
c. Disability	12,111	4,615	1,036	0.24%
d. Termination	139,829	(3,187)	19,182	4.50%
e. Health Subsidy	48,485	34,729	2,392	0.55%
Total	\$ 2,136,425	\$ 1,508,349	\$ 87,509	20.50%
2 Benefit Recipients	3,228,576	3,228,576		
3 Other Inactive	126,400	126,400		
4 Total Actuarial Values of Benefits	\$ 5,491,401	\$ 4,863,325	\$ 87,509	20.50%
5 Actuarial Value of Assets		\$ 3,682,959		
6 Unfunded Actuarial Accrued Liability (4 - 5)		\$ 1,180,366		
7 Funding Ratio		75.73%		
8 Market Value Measurements				
UAAL on market value		\$ 1,205,237		
Funded Ratio on market value		75.22%		

* APV – Actuarial Present Value

** Percentage of expected payroll for continuing active members.



Demonstration of Actuarially Determined Contribution Rate for FY 2021

Valuation as of December 31,	Actuarially Determined Total Contribution Rate	Projected Compensation for Plan Year (in Millions)	Total Contributions to Fund for Plan Year (in Millions)	Actuarial Accrued Liability (AAL \$M)	Actuarial Value of Assets (AVA \$M)	Unfunded Actuarial Accrued Liability (UAAL \$M)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2019	35.38%	\$ 433.9	\$ 153.5	\$ 4,863.3	\$ 3,683.0	\$ 1,180.4
2020	35.38%	445.0	157.4	4,996.9	3,788.6	1,208.3
2021	35.38%	457.2	161.8	5,132.0	3,897.8	1,234.3
2022	35.38%	469.7	166.2	5,260.8	4,002.6	1,258.2
2023	35.38%	482.5	170.7	5,383.7	4,103.6	1,280.0
2024	35.38%	495.7	175.4	5,500.3	4,200.8	1,299.5
2025	35.38%	509.2	180.2	5,610.4	4,294.0	1,316.4
2026	35.38%	523.1	185.1	5,714.0	4,383.4	1,330.5
2027	35.38%	537.4	190.1	5,811.2	4,469.6	1,341.7
2028	35.38%	552.2	195.4	5,902.7	4,553.1	1,349.6
2029	35.38%	567.6	200.8	5,989.4	4,635.3	1,354.1
2030	35.38%	583.2	206.3	6,071.9	4,717.2	1,354.7
2031	35.38%	599.5	212.1	6,151.1	4,799.9	1,351.2
2032	35.38%	616.1	218.0	6,227.1	4,884.0	1,343.1
2033	35.38%	632.6	223.8	6,299.7	4,969.7	1,330.0
2034	35.38%	649.4	229.8	6,369.0	5,057.4	1,311.5
2035	35.38%	666.6	235.8	6,435.2	5,147.9	1,287.3
2036	35.38%	684.3	242.1	6,498.7	5,241.9	1,256.9
2037	35.38%	702.5	248.5	6,560.1	5,340.4	1,219.7
2038	35.38%	721.1	255.1	6,619.9	5,444.6	1,175.2
2039	35.38%	740.4	262.0	6,678.9	5,556.0	1,122.9
2040	35.38%	760.2	269.0	6,738.1	5,676.0	1,062.1
2041	35.38%	780.7	276.2	6,798.0	5,806.0	992.0
2042	35.38%	801.5	283.6	6,859.5	5,947.6	911.9
2043	35.38%	823.0	291.2	6,923.4	6,102.2	821.2
2044	35.38%	845.3	299.1	6,990.9	6,272.1	718.8
2045	35.38%	868.1	307.1	7,063.8	6,459.8	604.1
2046	35.38%	891.3	315.4	7,143.3	6,667.5	475.8
2047	35.38%	915.0	323.7	7,230.4	6,897.4	333.0
2048	35.38%	939.0	332.2	7,326.0	7,151.3	174.7
2049	35.38%	963.4	340.9	7,430.5	7,430.9	(0.4)



**Information for City Ordinance 25695
For the Fiscal Year Commencing October 1, 2020**

1 Prior Adjusted Total Obligation Rate	36.00%
2 Actuarially Required Contribution Rate*	35.38%
3 Debt Service	
a Scheduled Debt Service Payment for FY 2021	\$ 37,987,077
b Projected Payroll	\$ 444,737,003
c Pension Obligation Bond Credit Rate (a/b)	8.54%
4 Current Total Obligation Rate (2 + 3c)	43.92%
5 Current Adjusted Total Obligation Rate	36.00% **
6 Allocation of Contribution Rates Commencing October 1, 2020	
a Employee (5 x .37)	13.32%
b City (5 x .63)	22.68%

* Actuarially determined level contribution rate as demonstrated on Table 2.

** If the absolute value of the difference between the Prior Adjusted Total Obligation Rate (PATOR) and the Current Total Obligation Rate (CTOR) is less than or equal to 3.0% then:

Current Adjusted Total Obligation Rate (CATOR) = PATOR

otherwise:

1) If $PATOR - CTOR > 3.00\%$ then the CATOR is set equal to the greater of:

- a) the average of the Prior Adjusted Total Obligation Rate and the Current Total Obligation Rate; or
- b) 90% of the Prior Adjusted Total Obligation Rate

or

2) If $PATOR - CTOR < -3.00\%$ then the CATOR is set equal to the lesser of:

- a) the average of the Prior Adjusted Total Obligation Rate and the Current Total Obligation Rate; or
- b) 110% of the Prior Adjusted Total Obligation Rate

Additionally, the CATOR cannot exceed 36.00%.



Excerpts from City Ordinance 25695

ACTUARIALLY REQUIRED CONTRIBUTION RATE – means, for any fiscal year, a rate of contribution to the fund, expressed as a percentage of members’ projected wages for such fiscal year, which is the sum of the following as determined in the actuarial valuation report for the preceding plan year:

- (A) the actuarial present value of the pension plan benefits and expenses that are allocated to a valuation period by the actuarial cost method; and
- (B) the contribution that will amortize the difference between the actuarial accrued liability of the fund and the actuarial value of the assets of the fund over the period of years required by generally accepted accounting principles.

CITY CONTRIBUTIONS – means, for each pay period ending during a transition year, the city shall contribute to the retirement fund an amount equal to:

- (A) 63% times the current total obligation rate for that fiscal year times the members’ wages for the pay period, minus
- (B) The pension obligation bond credit rate for that fiscal year times the members’ wages for the pay period;

and, for each pay period ending during each fiscal year, except for a transition year, the city shall contribute to the retirement fund an amount equal to:

- (C) 63% times the current adjusted total obligation rate for that fiscal year times the members’ wages for the pay period, minus
- (D) The pension obligation bond credit rate for that fiscal year times the members’ wages for the pay period.

EMPLOYEE CONTRIBUTIONS – means, for each pay period ending during a transition year, each member shall contribute to the retirement fund an amount equal to:

- (A) 37% times the current total obligation rate for that fiscal year times the member’s wages for the pay period;

and, for each pay period ending during each fiscal year, except for a transition year, the member shall contribute to the retirement fund an amount equal to:

- (B) 37% times the current adjusted total obligation rate for that fiscal year times the member’s wages for the pay period.

CURRENT ADJUSTED TOTAL OBLIGATION RATE – means, for any fiscal year, the rate determined by the board as follows, using whichever formula is applicable:

(A) If the current total obligation rate minus the prior adjusted total obligation rate is greater than three, then the current adjusted total obligation rate for such fiscal year is equal to the lesser of:

- (i) the prior adjusted total obligation rate plus one-half times the difference of the current total obligation rate minus the prior adjusted total obligation rate; or
- (ii) 110 percent times the prior adjusted total obligation rate; or
- (iii) 36 percent.

(B) If the difference between the current total obligation rate and the prior adjusted total obligation rate is less than three, then the current adjusted total obligation rate for such fiscal year is equal to the prior adjusted total obligation rate.

(C) If the prior adjusted total obligation rate minus the current total obligation rate is greater than three, then the current adjusted total obligation rate for such fiscal year is equal to the greater of:

- (i) the prior adjusted total obligation rate minus one-half times the difference of the prior adjusted total obligation rate minus the current total obligation rate; or
- (ii) 90 percent times the prior adjusted total obligation rate.

CURRENT TOTAL OBLIGATION RATE – means, for any fiscal year, the rate adopted by the board that is equal to the sum of the pension obligation bond credit rate for such fiscal year plus the actuarially required contribution rate for such fiscal year.

PENSION OBLIGATION BOND CREDIT RATE – means, for any fiscal year, the rate adopted by the board that is a percentage calculated by dividing:

- (A) the debt service due during such fiscal year on any pension obligation bonds, the proceeds of which have been deposited in the fund, by:
- (B) the total members' projected wages for such fiscal year, as reported in the relevant actuarial valuation report.

PRIOR ADJUSTED TOTAL OBLIGATION RATE – means:

- (A) for the fiscal year commencing October 1, 2006, the current total obligation rate that was effective for the prior fiscal year; and
- (B) for each fiscal year commencing on or after October 1, 2007, the current adjusted total obligation rate that was effective for the prior fiscal year.

PROJECTED PAYROLL – means the covered payroll for the valuation proceeding the fiscal year multiplied by the payroll growth assumption.

TRANSITION YEAR – means each of the following:

- (A) the first fiscal year in which debt service payments related to pension obligation bonds are due from the city;
- (B) the first fiscal year in which no debt service payments related to pension obligation bonds are due from the city; and
- (C) the fiscal year beginning October 1, 2005.

Net Assets Available for Benefits
(\$ in 000s)

	December 31, 2018	December 31, 2019
1 Assets		
a. Cash & Short-Term	\$ 102,781	\$ 325,309
2 Receivables		
a. Accrued Investment Income	\$ 14,201	\$ 14,467
b. Securities Sold	2,789	4,243
c. Employer Contribution	2,058	2,307
d. Employee Contribution	1,903	2,164
e. Pending Contracts	-	438,841
	\$ 20,951	\$ 462,022
3 Investments		
a. Index Funds	\$ 119,550	\$ 176,734
b. Fixed Income	911,461	997,117
c. Equities	1,871,968	1,872,596
d. Real Estate	232,171	230,183
e. Private Equity	27,111	267,422
	\$ 3,162,261	\$ 3,544,052
4 Total Assets	\$ 3,285,993	\$ 4,331,383
5 Liabilities		
a. Accounts Payable	\$ 7,434	\$ 7,267
b. Investment Transactions	13,157	666,028
	\$ 20,591	\$ 673,295
6 Net Assets Available For Benefits	\$ 3,265,402	\$ 3,658,088



Change in Assets Available for Benefits
Fiscal Year Ending December 31, 2019
(\$ in 000s)

	2018	2019
1 Assets Available at Beginning of Year	\$ 3,601,612	\$ 3,265,402
Adjustment *	<u>10,647</u>	<u>16,911</u>
	\$ 3,612,259	\$ 3,282,313
 2 Revenues		
a. Employer Contributions	\$ 60,924	\$ 62,177
b. Employee Contributions	56,760	58,314
c. Investment Income	104,544	114,123
d. Investment Expense	(14,446)	(18,129)
e. Realized and Unrealized Gains (Losses)	(272,937)	453,838
f. Other (Security Lending)	<u>1,381</u>	<u>1,411</u>
Total Revenues	\$ (63,774)	\$ 671,734
 3 Expenses		
a. Benefits	\$ 263,963	\$ 278,007
b. Refunds	8,443	10,436
c. Operating Expense	<u>10,677</u>	<u>7,516</u>
Total Expense	\$ 283,083	\$ 295,959
 4 Assets Available at End of Year (1 + 2 - 3)	<u>\$ 3,265,402</u>	<u>\$ 3,658,088</u>

* Change due to difference between unaudited asset value used for prior valuation and audited asset value reported the following year.

Development of Actuarial Value of Assets

(\$ in 000s)

December 31, 2019

1. Market value of assets at beginning of year	\$	3,265,402
2. External cashflow		
a. Contributions	\$	120,491
b. Benefits and refunds paid		(288,443)
c. Administrative and miscellaneous expenses		(7,513)
d. Subtotal		<u>(175,465)</u>
3. Assumed investment return rate for fiscal year		7.75%
4. Assumed investment income for fiscal year	\$	246,396
5. Expected Market Value at end of year (1+ 2 + 4)	\$	3,336,333
6. Market value of assets at end of year	\$	3,658,088
7. Difference (6 - 5)	\$	321,755

8. Development of amounts to be recognized as of December 31, 2019:

Fiscal Year	Remaining Deferrals of Excess (Shortfall) of Investment Income	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
End	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2015	\$ 0	\$ 0	\$ 0	1	\$ 0	\$ 0
2016	0	0	0	2	0	0
2017	0	0	0	3	0	0
2018	(354,917)	321,755	(33,162)	4	(8,291)	(24,871)
2019	<u>321,755</u>	<u>(321,755)</u>	<u>0</u>	5	<u>0</u>	<u>0</u>
Total	\$ (33,162)	\$ 0	\$ (33,162)		\$ (8,291)	\$ (24,871)

9. Final actuarial value of plan net assets, end of year (Item 6 - Item 8, Column 6)	\$	3,682,959
10. Ratio of actuarial value to market value		100.7%

Notes: Remaining deferrals in Column (1) for prior years are from last year's report Table 6, column 6. The number in the current year is Item 7, above. Column 2 is a direct offset of the current year's excess/(shortfall) return against prior years' excess/(shortfall) of the opposite type.



Historical Investment Performance
Dollar Weighted Basis Net of Investment Expenses

<u>Calendar Year</u>	<u>On Market Value</u>	<u>On Actuarial Value</u>
2000	-3.45%	9.59%
2001	-5.46%	2.76%
2002	-9.81%	-5.37%
2003	27.05%	2.03%
2004	15.22%	9.38%
2005	7.93%	13.71%
2006	16.90%	13.03%
2007	3.56%	9.58%
2008	-31.31%	-3.76%
2009	30.35%	6.79%
2010	15.77%	4.30%
2011	0.86%	1.15%
2012	14.29%	2.82%
2013	16.75%	10.65%
2014	6.14%	10.29%
2015	-1.83%	7.02%
2016	8.65%	8.51%
2017*	12.34%	8.99%
2018	-5.15%	5.23%
2019	17.30%	6.74%
5-year average ending in 2019	5.92%	7.29%
10-year average ending in 2019	8.23%	6.53%

*The yield on the actuarial value of assets for 2017 includes the impact of the method change for the Actuarial Value of Assets.



**Analysis of Change in Unfunded
Actuarial Accrued Liability
For the Year Ending December 31, 2019
(\$ in 000s)**

1. UAAL as of December 31, 2018		\$ 906,677
2. Expected Change in UAAL during 2019		
a. Expected Amortization Payment for CY 2019	(59,385)	
b. Interest adjustments on 1 & 2a to Year End @ 7.75%	68,009	
c. Expected change in UAAL		8,624
3. Increase/(Decrease) in UAAL Due to Difference Between Calculated Contribution Rate and Actual Contribution		30,032
4. Net Actuarial Experience (Gains) & Losses		29,642
5. Assumption and Method Changes		205,391
6. UAAL as of December 31, 2019		\$ 1,180,366

Investment Experience (Gain) or Loss
(\$ in 000s)

Item	Valuation as of December 31, 2019
1. Actuarial assets, beginning of year	\$ 3,620,319
2. Contributions	120,491
3. Benefits and refunds paid with administrative expenses	(295,956)
4. Assumed net investment income at 7.75% on	
a. Beginning of year assets	280,575
b. Contributions	4,582
c. Benefits and refunds paid with administrative expenses	(11,254)
d. Total	\$ 273,903
5. Expected actuarial assets, end of year (Sum of Items 1 through 4)	3,718,757
6. Actual actuarial assets, end of year	3,682,959
7. Asset experience (gain)/loss for year	35,798

**Analysis of Actuarial (Gains) and Losses
For 2019
(\$ in 000s)**

	2019
Investment Return	\$ 35,798
Salary Increase	35,205
Age and Service Retirement	(1,775)
General Employment Termination	(5,315)
Disability Incidence	(124)
Active Mortality	(152)
Benefit Recipient Mortality	(2,131)
Actual vs. Expected Cost of Living Adjustment (COLA)*	(23,237)
Other	(8,627)
Total Actuarial (Gain)/ Loss	\$ 29,642
Actuarial Assumption Change	\$ 205,391

* Actual COLA of 1.64% versus expected COLA of 2.75%

Schedule of Funding Status
(\$ in 000s)

End of Year	Actuarial Value of Assets (a)	AAL (b)	UAAL (b-a)	Funding Ratio (a/b)	Payroll* (c)	UAAL as % of Payroll ((b-a)/c)
1998	\$1,617,468	\$1,750,430	\$132,962	92.40%	\$275,547	48.30%
1999	1,862,644	1,873,998	11,353	99.39%	282,127	4.00%
2000	1,997,828	2,038,078	40,250	98.03%	298,355	13.50%
2001	2,017,041	2,276,488	259,447	88.60%	332,842	77.90%
2002	1,863,701	2,399,569	535,868	77.67%	324,615	165.08%
2003	1,843,099	2,489,071	645,972	74.05%	318,492	202.82%
2004	2,482,082	2,488,270	6,188	99.75%	331,201	1.87%
2005	2,739,269	2,606,173	(133,096)	105.11%	332,446	-40.04%
2006	2,998,099	2,761,404	(236,695)	108.57%	344,997	-68.61%
2007	3,183,260	2,915,164	(268,096)	109.20%	370,150	-72.43%
2008	2,957,506	3,075,385	117,879	96.17%	389,362	30.27%
2009	3,031,652	3,192,120	160,468	94.97%	375,164	42.77%
2010	3,027,439	3,282,126	254,687	92.24%	332,045	76.70%
2011	2,916,746	3,391,652	474,906	86.00%	318,972	148.89%
2012	2,846,124	3,518,356	672,232	80.89%	340,452	197.45%
2013	3,074,284	3,610,845	362,477	85.14%	352,486	102.83%
2014	3,241,053	4,004,055	763,002	80.94%	374,002	204.01%
2015	3,320,387	4,129,133	808,746	80.41%	404,981	199.70%
2016	3,451,463	4,291,802	840,339	80.42%	420,693	199.75%
2017	3,601,612	4,377,844	776,232	82.27%	432,854	179.33%
2018	3,620,319	4,526,996	906,677	79.97%	435,375	208.25%
2019	3,682,959	4,863,325	1,180,366	75.73%	444,737	265.41%

Summary of Data Characteristics

As of December 31,	<u>2017</u>	<u>2018</u>	<u>2019</u>
Active Members			
Number	7,838	7,584	7,427
Total Annualized Earnings of Members as of 12/31 (000s)	\$ 421,269	\$ 423,723	\$ 433,890
Average Earnings	53,747	55,871	58,421
Benefit Recipients			
Number	7,042	7,224	7,405
Total Annual Retirement Income (000s)	\$ 244,768	\$ 258,085	\$ 269,263
Total Annual Health Supplement (000s)	10,220	10,523	10,984
Average Total Annual Benefit	36,223	37,200	37,871
Inactive Members*			
Deferred Vested	793	819	877
Deferred Nonvested	455	673	789
Total	1,248	1,492	1,666

* The number of inactives on 12/31/2019 includes 877 members who have applied for a deferred pension and 789 other members who have terminated and still have contribution balances in the Fund.

Distribution of Active Members and Payroll by Age and Years of Service

Age	Years of Service							Totals	
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29		30 & Over
Under 20									0
									\$0
20-24	86	73	2						161
	\$2,849,884	\$2,801,922	\$73,380						\$5,725,186
25-29	165	353	65	0					583
	\$6,879,660	\$15,604,905	\$3,310,646	\$0					\$25,795,211
30-34	166	369	201	50					786
	\$7,810,585	\$18,234,364	\$10,737,310	\$2,959,678					\$39,741,937
35-39	124	296	210	157	30	4			821
	\$5,716,094	\$15,908,958	\$12,748,779	\$10,029,673	\$2,045,043	\$261,773			\$46,710,320
40-44	118	278	197	171	90	59	1		914
	\$5,886,426	\$15,779,853	\$12,297,592	\$10,833,785	\$6,413,293	\$3,904,144	\$54,485		\$55,169,578
45-49	93	243	173	158	128	168	54	1	1,018
	\$4,285,543	\$13,202,222	\$11,095,547	\$9,986,786	\$8,177,526	\$11,347,728	\$3,778,037	\$102,420	\$61,975,809
50-54	88	233	167	183	147	186	88	20	1,112
	\$4,296,923	\$12,892,287	\$9,440,982	\$11,971,392	\$10,449,642	\$13,374,124	\$6,301,224	\$1,475,778	\$70,202,352
55-59	58	197	154	220	162	169	39	46	1,045
	\$2,786,560	\$11,189,742	\$8,798,023	\$13,167,752	\$10,520,389	\$11,488,765	\$3,032,084	\$3,779,556	\$64,762,871
60-64	33	109	111	140	89	97	44	42	665
	\$1,807,222	\$5,999,567	\$6,784,405	\$8,771,980	\$5,777,913	\$6,588,005	\$3,256,067	\$3,576,112	\$42,561,271
65&Over	8	35	51	71	47	56	18	36	322
	\$388,926	\$2,153,435	\$2,924,287	\$4,718,790	\$3,296,824	\$3,564,028	\$1,329,005	\$2,869,929	\$21,245,224
Totals	939	2,186	1,331	1,150	693	739	244	145	7,427
	\$42,707,823	\$113,767,255	\$78,210,951	\$72,439,836	\$46,680,630	\$50,528,567	\$17,750,902	\$11,803,795	\$433,889,759



**Distribution of Benefit Recipients
as of December 31, 2019**

Age	Number	Annual Benefit*	Annual Average Benefit*
Under 50	45	\$ 741,627	\$ 16,481
50-54	197	8,598,939	43,649
55-59	657	30,317,521	46,145
60-64	1,303	50,806,210	38,992
65-69	1,724	64,763,938	37,566
70-74	1,523	58,046,066	38,113
75-79	886	27,848,855	31,432
80-84	547	15,658,193	28,626
85-89	316	7,801,810	24,689
90 & Over	207	4,679,946	22,608
 Total	 7,405	 \$ 269,263,106	 \$ 36,362

* Does not include Health Benefit Supplement.

Schedule of Active Member Valuation Data

<u>Year Ending December 31,</u>	<u>Active Participants</u>	<u>Percent Change</u>	<u>Covered Payroll</u>	<u>Percent Change</u>	<u>Average Salary</u>	<u>Percent Change</u>
2007	8,117	-	\$ 359,369,000	-	\$ 44,274	-
2008	8,371	3.1%	378,021,000	5.2%	45,158	2.0%
2009	7,654	-8.6%	364,237,000	-3.6%	47,588	5.4%
2010	7,034	-8.1%	322,374,000	-11.5%	45,831	-3.7%
2011	6,745	-4.1%	309,682,000	-3.9%	45,913	0.2%
2012	6,864	1.8%	330,536,000	6.7%	48,155	4.9%
2013	6,993	1.9%	342,219,000	3.5%	48,937	1.6%
2014	7,180	2.7%	363,109,000	6.1%	50,572	3.3%
2015	7,477	4.1%	393,186,000	8.3%	52,586	4.0%
2016	7,619	1.9%	409,433,000	4.1%	53,738	2.2%
2017	7,838	2.9%	421,269,000	2.9%	53,747	0.0%
2018	7,584	-3.2%	423,723,000	0.6%	55,871	4.0%
2019	7,427	-2.1%	433,890,000	2.4%	58,421	4.6%



Schedule of Retirees and Beneficiaries Added to and Removed from Rolls

Year Ending December 31,	Added to Rolls		Removed from Rolls		Rolls-End of Year		% Increase in Annual Allowances	Average Annual Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2007	239	\$ 7,250,468	205	\$ 4,551,742	5,304	\$142,267,609	-	\$ 26,823
2008	383	8,905,680	211	4,684,964	5,476	154,692,846	8.7%	28,249
2009	446	9,268,740	216	4,795,982	5,706	165,826,328	7.2%	29,062
2010	508	12,798,268	221	4,907,000	5,993	179,730,384	8.4%	29,990
2011	404	10,012,165	198	4,396,317	6,199	193,851,170	7.9%	31,271
2012	325	9,795,464	204	4,529,539	6,320	202,120,582	4.3%	31,981
2013	324	11,246,955	197	4,327,990	6,447	210,027,512	3.9%	32,578
2014	370	12,415,771	219	4,821,713	6,598	219,150,070	4.3%	33,215
2015	476	13,777,204	318	6,847,464	6,756	226,019,290	3.1%	33,455
2016	384	12,746,549	237	5,562,549	6,903	237,992,528	5.3%	34,477
2017	383	9,893,931	244	6,375,641	7,042	244,768,143	2.8%	34,758
2018	402	14,905,595	220	5,976,286	7,224	258,085,328	5.4%	35,726
2019	478	17,715,050	297	8,368,302	7,405	269,263,106	10.0%	36,362



Solvency Test (\$ in 000s)

Valuation Date	Aggregated Accrued Liabilities for			Reported Assets	Portions of Accrued Liabilities Covered by Reported Assets		
	Active and Inactive Members Contributions	Retirees and Beneficiaries	Active and Inactive Members (Employer Financed Portion)		(5)/(2)	[(5)-(2)]/3	[(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
December 31, 2007	\$ 206,090	\$ 1,591,731	\$ 1,117,343	\$ 3,183,260	100.0%	100.0%	100.0%
December 31, 2008	221,667	1,707,599	1,146,119	2,957,506	100.0%	100.0%	89.7%
December 31, 2009	228,666	1,834,491	1,128,963	3,031,652	100.0%	100.0%	85.8%
December 31, 2010	232,727	2,041,322	1,008,077	3,027,439	100.0%	100.0%	74.7%
December 31, 2011	240,821	2,181,731	969,100	2,916,746	100.0%	100.0%	51.0%
December 31, 2012	257,716	2,250,533	1,010,107	2,846,124	100.0%	100.0%	33.4%
December 31, 2013	278,892	2,319,424	1,012,529	3,074,284	100.0%	100.0%	47.0%
December 31, 2014	301,567	2,578,071	1,124,417	3,241,053	100.0%	100.0%	32.1%
December 31, 2015	325,607	2,650,638	1,152,888	3,320,387	100.0%	100.0%	29.9%
December 31, 2016	350,646	2,770,533	1,170,623	3,451,463	100.0%	100.0%	28.2%
December 31, 2017	373,193	2,854,818	1,149,833	3,601,612	100.0%	100.0%	32.5%
December 31, 2018	392,004	2,989,597	1,145,395	3,620,319	100.0%	100.0%	20.8%
December 31, 2019	408,984	3,228,576	1,225,766	3,682,959	100.0%	100.0%	3.7%



EXPERIENCE TABLES

Table Number	Content of Tables	Page
15	Analysis of Pay Experience (Valuation Pay)	40
16a	Analysis of Retirement Experience – Each Age	41
16b	Analysis of Retirement Experience – Age Groups	42
17	Analysis of Turnover Experience	43
18	Analysis of Active Mortality Experience	44
19	Analysis of Disability Experience	45
20	Analysis of Retiree Mortality Experience	46

**Pay Experience for Employees who are Active at
Beginning and End of Year
Valuation Pay Analysis
Analyzed by Years of Service**

Service Beginning of Year	Experience for 2019			
	Number	Expected Pay	Actual Pay	Ratio A/E
Under 5	1,947	\$ 98,967,990	\$ 101,463,637	102.52%
5-9	1,486	84,069,981	85,411,055	101.60%
10-14	1,108	68,206,392	69,882,938	102.46%
15-19	701	46,217,700	47,290,563	102.32%
20-24	777	50,700,220	52,514,418	103.58%
25-29	273	18,992,878	19,612,917	103.26%
30 & Over	165	13,023,614	13,313,549	102.23%
Total	6,457	\$ 380,178,775	\$ 389,489,077	102.45%
Over 10 Years	3,024	\$ 197,140,804	\$ 202,614,385	102.78%

Service Beginning of Year	Experience for 2015-2019			
	Number	Expected Pay	Actual Pay	Ratio A/E
Under 5	10,109	\$ 480,328,582	\$ 488,026,238	101.60%
5-9	6,752	370,185,321	372,968,512	100.75%
10-14	5,930	347,219,232	349,453,654	100.64%
15-19	4,407	263,721,804	265,996,461	100.86%
20-24	3,519	223,059,586	225,920,091	101.28%
25-29	1,444	100,584,035	101,596,476	101.01%
30 & Over	978	72,436,290	72,892,156	100.63%
Total	33,139	\$ 1,857,534,850	\$ 1,876,853,588	101.04%
Over 10 Years	16,278	\$ 1,007,020,947	\$ 1,015,858,838	100.88%

Analysis of Retirement Experience

Each Age

Age	2019 Retirement			2015-2019 Retirement		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
46	-	-	N/A	-	-	N/A
47	-	-	N/A	-	-	N/A
48	-	-	N/A	1	0.90	111.11%
49	-	0.10	0.00%	4	2.90	137.93%
50	5	6.20	80.65%	45	49.80	90.36%
51	10	8.65	115.61%	42	51.25	81.95%
52	7	10.32	67.83%	44	57.32	76.76%
53	9	7.90	113.92%	53	58.55	90.52%
54	6	8.50	70.59%	47	52.52	89.49%
55	18	13.20	136.36%	55	59.86	91.88%
56	8	13.07	61.21%	52	70.31	73.96%
57	23	18.62	123.52%	70	79.43	88.13%
58	12	15.37	78.07%	51	76.11	67.01%
59	21	20.74	101.25%	60	87.52	68.56%
60	22	25.31	86.92%	114	132.88	85.79%
61	17	23.83	71.34%	76	116.82	65.06%
62	24	21.30	112.68%	86	104.45	82.34%
63	9	19.65	45.80%	60	95.40	62.89%
64	16	17.00	94.12%	61	72.70	83.91%
65	22	16.90	130.18%	79	83.68	94.41%
66	20	14.40	138.89%	79	73.10	108.07%
67	21	14.00	150.00%	54	55.35	97.56%
68	8	6.45	124.03%	36	36.20	99.45%
69	8	6.85	116.79%	28	28.55	98.07%
70 & Over	21	90.00	23.33%	68	381.00	17.85%
Total	307	378.36	81.14%	1,265	1,826.60	69.25%
Total Under 70	286	288.36	99.18%	1,197	1,445.60	82.80%



Analysis of Retirement Experience

Age Groups

Age Group	2019 Retirements			2015-2019 Retirements		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
Under 55	37	41.67	88.79%	236	273.24	86.37%
55-59	82	81.00	101.23%	288	373.23	77.16%
60-64	88	107.09	82.17%	397	522.25	76.02%
65-69	79	58.60	134.81%	276	276.88	99.68%
70 & Over	21	90.00	23.33%	68	381.00	17.85%
Total	307	378.36	81.14%	1,265	1,826.60	69.25%
Total Under 70	286	288.36	99.18%	1,197	1,445.60	82.80%

Analysis of Turnover Experience

Years of Service	2019 Quits			2015-2019 Quits		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
0-4	530	356.72	148.58%	2,175	1,797.26	121.02%
5-9	180	103.67	173.64%	598	440.33	135.81%
10-14	57	37.09	153.66%	260	205.55	126.49%
15-19	17	15.76	107.85%	90	92.42	97.38%
20-24	19	9.10	208.84%	48	42.00	114.30%
25-29	2	0.74	269.54%	4	3.12	128.12%
Total	805	523.08	153.90%	3,175	2,580.68	123.03%

Analysis of Active Mortality Experience

Age	2019 Deaths			2015-2019 Deaths*		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
20-24	-	0.05	0.00%	1	0.22	445.21%
25-29	-	0.21	0.00%	1	1.01	99.19%
30-34	-	0.42	0.00%	1	1.99	50.31%
35-39	-	0.64	0.00%	3	3.21	93.32%
40-44	-	1.11	0.00%	7	5.39	129.94%
45-49	-	1.68	0.00%	3	9.29	32.29%
50-54	2	3.04	65.77%	14	16.56	84.53%
55-59	-	4.78	0.00%	10	23.27	42.97%
60 and Over	6	8.19	73.23%	26	37.45	69.43%
Total	8	20.11	39.77%	66	98.39	67.08%

Analysis of Disability Experience

Age	2019 Disabilities			2015-2019 Disabilities		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
20-24	-	0.02	0.00%	-	0.11	0.00%
25-29	-	0.14	0.00%	-	0.67	0.00%
30-34	-	0.26	0.00%	-	1.21	0.00%
35-39	-	0.39	0.00%	-	1.93	0.00%
40-44	1	0.78	128.30%	3	3.84	78.15%
45-49	-	1.68	0.00%	2	9.06	22.07%
50-54	-	3.27	0.00%	10	17.35	57.64%
55-59	3	4.09	73.31%	7	20.07	34.88%
60 and Over	1	1.54	64.75%	5	6.55	76.39%
Total	5	12.18	41.05%	27	60.78	44.43%

Analysis of Retiree Mortality Experience*

Age	2019 Experience			2015-2019 Experience		
	Actual	Expected	Ratio A/E	Actual	Expected	Ratio A/E
Under 60	20	2.90	690.51%	42	15.78	266.10%
60-64	18	9.03	199.33%	61	47.74	127.77%
65-69	26	20.52	126.69%	109	105.07	103.74%
70-74	40	29.22	136.91%	134	121.47	110.31%
75-79	23	26.71	86.11%	117	118.86	98.43%
80-84	27	24.37	110.78%	119	113.37	104.97%
85-89	25	21.61	115.69%	122	114.32	106.72%
90 & over	35	22.89	152.89%	127	103.06	123.22%
Total	214	157.25	136.09%	831	739.68	112.35%

**This analysis does not include beneficiary, QDRO, or disabled deaths.*

ACTUARIAL METHODS AND ASSUMPTIONS

The most recent experience study was completed in conjunction with the December 31, 2019 actuarial valuation. Please see our experience study, dated June 2020, to see more detail of the rationale for the current assumptions. As authorized under Sec. 40A-9 of Chapter 40A, the actuarial assumptions and methods are established set by the Board of Trustees based upon recommendations from the Fund's actuary.

Entry Age Normal Method

The Entry Age Normal actuarial cost method is the actuarial valuation method used for all purposes under ERF. The concept of this method is that funding of benefits for each member should be affected as a, theoretically, level contribution (as a level percentage of pay) from entry into ERF to termination of active status.

The Normal Cost (NC) for a fiscal year under this method is determined as described in the prior paragraph for each member. The ERF NC for the year is the total of individual normal costs determined for each active member. The Actuarial Accrued Liability (AAL) under this method is the theoretical asset balance of the normal costs that would have accumulated to date based upon current actuarial assumptions. To the extent that the assets of the fund are insufficient to cover the AAL, an Unfunded Actuarial Accrued Liability (UAAL) develops.

Actuarially Determined Contribution

The actuarially determined contribution rate is developed using an open group projection. The total contribution rate (member plus City) is the level percentage of pay needed to fund the Normal Cost for each year and pay off the UAAL over 30 years.

In the open group projection, the demographic assumptions are applied to the current active employees and any employees that are assumed to leave employment are replaced one for one with a new employee. Over time this results in the change of the employee group from mostly Tier A members to Tier B members. The projection is built to assume no gains or losses on the actuarial accrued liability or the actuarial value of assets.

In the projection, new members' pay is assumed to increase at 3.00% year over year (i.e. a new employee in 2020 is assumed to be hired at a salary that is 3.00% greater than a new employee hired in 2019). The 3.00% growth rate is equal to our wage inflation assumption of 3.00% (ultimate salary increase



ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

assumption). Note that this is not an assumption that payroll will grow at 3.00% per year. Payroll could grow more slowly in the near-term due to membership demographics.

New Entrant Profile

For the purposes of determining the funding period, an open group projection is used which replaces on a one-to-one basis each active member who leaves employment with an average new hire. The average new hire is determined based on a new entrant profile, which is created from the valuation data by determining the entry age and entry pay for anyone with eight or less years of service as of the valuation date, with salaries normalized to the valuation date. A summary of the new entrant profile is shown in the table below, with 25.9% of the population being male. The salaries below would be applicable for the year preceding the valuation date. Future cohorts of new hires have starting salaries that are assumed to grow at the General Wage Inflation of 3.00% over the salaries of the previous year.

New Entrant Profile		
Entry Age	# of Employees	Average Salary
15-19	3	39,150
20-24	127	37,261
25-29	201	43,196
30-34	193	46,921
35-39	160	51,724
40-44	141	55,026
45-49	120	56,755
50-54	105	56,915
55-59	73	51,121
60-64	36	61,036
65-69	4	56,905
Total	1,163	49,498

Actuarial Value of Asset Method

The method for determining the actuarial value of assets in future years is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual market value and the expected actuarial value of assets each year, and recognizes the cumulative excess return (or shortfall) at a minimum rate of 20% per year. Each year, a base is set up to reflect this difference. If the current year's base is of opposite sign to the deferred bases, then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base.



ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Annual Rate of Investment Return: For all purposes under the Fund, the rate of investment return is assumed to be 7.25% per annum, net of investment expenses. This rate includes an annual assumed rate of inflation of 2.50%. In addition, annual cost-of-living adjustments are assumed to occur on average at the rate of 2.50% per annum for Tier A members and 2.20% for Tier B members (due to the lower maximum on cost-of-living-adjustments).

Annual Compensation Increases: Each member's compensation is assumed to increase in accordance with a table based on actual ERF experience. Sample rates follow:

Years of Service	Merit, Promotion, Longevity		General		Total	
0	5.25	%	3.00	%	8.25	%
1	4.25		3.00		7.25	
2	3.25		3.00		6.25	
3	2.50		3.00		5.50	
4	2.00		3.00		5.00	
5	1.75		3.00		4.75	
6	1.75		3.00		4.75	
7	1.25		3.00		4.25	
8	1.25		3.00		4.25	
9	1.00		3.00		4.00	
10	1.00		3.00		4.00	
11	1.00		3.00		4.00	
12	0.75		3.00		3.75	
13	0.75		3.00		3.75	
14	0.75		3.00		3.75	
15	0.75		3.00		3.75	
16	0.75		3.00		3.75	
17	0.75		3.00		3.75	
18	0.50		3.00		3.50	
19 & Over	0.00		3.00		3.00	

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Mortality:

Disabled Lives: The gender-distinct 2019 Texas Municipal Retirees Mortality Table for males and females respectively, set forward 4 years for males and 3 years for females. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements.

Sample rates as of 2019 follow (rate per 1,000):

Age	Disability Mortality Rate	
	Male	Female
20	35	30
30	35	30
40	35	30
50	35	30
60	35	30
70	35	30
80	84	51
90	240	164

Other Benefit Recipients:

The gender-distinct 2019 Texas Municipal Retirees Mortality Tables are used for males and females respectively. The rates are projected on a fully generational basis by Scale UMP to account for future mortality improvements.

Sample rates as of 2019 follow (rate per 1,000), with projected mortality applied:

Age	Mortality Rate	
	Male	Female
30	0.4	0.1
40	0.8	0.4
50	2.8	1.2
60	7.5	3.6
70	20.2	11.3
80	55.9	35.8
90	157.2	114.2

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Mortality:

Active Members: The PUB(10) Mortality Table for General Employees tables are used for males and females respectively. The rates are projected on a fully generational basis using Scale UMP.

Sample rates follow (rate per 1,000):

Age	Mortality Rate	
	Male	Female
30	0.3	0.1
40	0.6	0.3
50	1.4	0.8
60	2.9	1.7
70	6.4	4.5
80	15.8	12.2
90	134.9	105.6

10% of active deaths are assumed to be service related.

Disability: A client-specific table of disability incidence with sample rates follows (rate per 1,000):

Age	Disability Rate
30	0.1
40	0.5
50	1.2
60	2.2

20% of disabilities are assumed to be service related. There is a 0% assumption of disability for members who have over 10 years of service and are eligible for retirement.

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Retirement: Upon eligibility, active members are assumed to retire as follows (rate per 1,000):

Tier A:

Age	Male		Female	
	<u>First Year Eligible</u>	<u>Thereafter</u>	<u>First Year Eligible</u>	<u>Thereafter</u>
48-49	100	100	100	100
50	550	550	450	350
51	500	450	400	350
52	500	300	400	300
53	400	300	350	300
54	350	250	350	200
55	300	250	350	250
56	300	250	350	250
57	300	250	350	250
58-59	300	250	250	200
	<u>Service < 18 yrs.</u>	<u>Service 18 yrs.+</u>	<u>Service < 18 yrs.</u>	<u>Service 18 yrs. +</u>
60	80	230	90	200
61	90	230	90	180
62	100	230	90	200
63	100	230	150	150
64	150	230	120	130
65	150	230	120	300
66	200	230	150	300
67	200	230	250	300
68	200	230	150	300
69	200	230	150	300
70	1,000	1,000	1,000	300

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Retirement, Continued:

Upon eligibility, active members are assumed to retire as follows (rate per 1,000):

Tier B:

Age	Male		Female	
	Service < 40 yrs.	Service 40 yrs. +	Service < 40 yrs.	Service 40 yrs. +
<55	10	350	10	350
55-56	20	350	20	350
57-58	30	350	30	350
59-60	40	350	40	350
61-62	50	350	50	350
63-64	60	350	60	350
65	180	600	200	450
66	200	250	250	250
67	200	250	250	250
68	200	250	150	250
69	200	250	150	250
70	1,000	1,000	1,000	1,000

*For service < 40 yrs, rates shown are for those who met the rule of 80.

Retirement of Deferred Vested Members:

All deferred vested members are assumed to commence payment at their normal retirement age, which is age 60 for Tier A members and age 65 for Tier B members.

ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

General Turnover: A table of termination rates based on ERF experience as shown below.

Years of Service	Terminations (per 1,000)	
	Male	Female
0	228	200
1	180	165
2	144	150
3	110	120
4	90	95
5	75	90
6	67	80
7	60	65
8	51	48
9	43	48
10	33	45
11	33	32
12	30	30
13	30	30
14	22	20
15	22	14
16	19	14
17	19	14
18	19	14
19	19	14
20	12	14
21	12	14
22	12	6
23	12	6
24	12	6
25	12	6
26 & Over	5	6

There is 0% assumption of termination for members eligible for retirement.

Mortality Improvement: Scale UMP is used to project mortality improvements for retirees on a fully generational basis.

Refunds of Contributions: Members are assumed to choose the most valuable termination benefit.



ACTUARIAL METHODS AND ASSUMPTIONS (cont.)

Operational Expenses: The amount of estimated administrative expenses expected in the next year is assumed to be equal to the prior year's expenses and is incorporated in the Normal Cost.

Marital Status: 75% of active male members and 50% of active female employees are assumed to be married.

Vacation Leave Conversions: Members with 20 or more years of service are assumed to convert unused vacation leave to 1.5 months of service. Other members are assumed to convert unused vacation leave to 1 month of service. No vacation leave conversion is assumed for disability retirement.

Spouse Age: The female spouse is assumed to be 3 years younger than the male spouse.

Payroll Growth Rate: Used to estimate projected payroll for the following fiscal year. Assumed to be equal to the inflation rate of 2.50%.

Member's Pay: In determining the member's valuation salary, the greater of the prior calendar year's gross pay and the member's rate of compensation is used.

Form of Payment: For Tier A it is assumed that 60% of married active male members and 84% of married active female employees will elect a Joint & 50% Survivor form of payment. Taking into consideration the marriage assumption and the inherent subsidy in the System's Joint & 100% Survivor factors, the male employees are valued with Joint and 28.0% Survivor annuities and the female employees are valued with Joint and 19.5% Survivor annuities. It is also assumed that 100% of Tier B employees will elect the normal form of payment under Tier B.

Data Adjustments: Certain records are missing spousal information. For these records we use the marital status assumption and spousal age difference assumption to value these records. No other adjustments are made to the data.

Actuarial Equivalence Assumptions: for form of payment conversion and Tier B early retirement factors are based on the following assumptions:

- a. Interest Rate of 8.00%.
- b. Mortality: Unisex blend (60% male and 40% female) of the following assumptions for males and females. 109% of the RP-2000 Combined Healthy Table for males with Blue Collar adjustment projected to 2026 using improvement scale BB for males. 103% of the RP-2000 Combined Healthy Table for females with Blue Collar adjustment projected to 2026 using improvement scale BB for females.
- c. Cost-of-living-adjustments (COLA): a 3.0% COLA assumption for Tier A members and a 2.50% COLA assumption for Tier B members.

Changes in Assumptions and Methods Since Prior Valuation: Changes were made to salary, mortality, retirement, and turnover rates. The discount rate, payroll growth rate, and form of payment assumptions have also been updated. Please see the experience study report dated June 2020 for more information.



SUMMARY OF BENEFIT PROVISIONS

Employees' Retirement Fund of the City of Dallas As of December 31, 2019

Membership

An employee becomes a member upon permanent employment and contributes to the Fund.

Tier A

A person who was employed by the City prior to January 1, 2017, or who was re-employed by the City on or after January 1, 2017 and whose pre January 1, 2017 credited service was not cancelled by withdrawal or forfeiture or was reinstated.

Tier B

A person who was employed by the City on or after January 1, 2017, or who was re-employed by the City on or after January 1, 2017 and whose pre January 1, 2017 credited service has been cancelled by withdrawal or forfeiture.

Contributions

Member: 37% of the current adjusted total obligation rate. New rates effective October 1 after the valuation date.

City: 63% of the current adjusted total obligation rate. New rates effective October 1 after the valuation date.

Definitions

Final Average Salary:

Tier A

Average monthly salary over the member's highest three years (or 36 months) of service.

Tier B

Average monthly salary over the member's highest five years (or 60 months) of service.

Credited Service: Length of time as an employee of the City of Dallas and while making contributions to the Fund.



SUMMARY OF BENEFIT PROVISIONS (cont.)

Retirement Pension

Eligibility:

Tier A

- a. Attainment of age 60; or
- b. Attainment of age 55 (if credited service began before May 9, 1972); or
- c. At any age after completion of 30 years of credited service with a reduced benefit before age 50; or
- d. Attainment of age 50, if the sum of an active member's age and credited service is at least equal to 78.

Tier B

- a. Attainment of age 65 and 5 years of service; or
- b. At any age after completion of 40 years of credited service; or
- c. At any age if the sum of an active member's age and credited service is at least equal to 80 (under this eligibility the member's pension will be actuarially reduced for each year prior to the age of 65 that the member retires).

Retirement Benefits:

Tier A

The retirement benefit equals 2-3/4% multiplied by average monthly earnings multiplied by credited service limited to a maximum of 36.3636 years plus a monthly \$125 health supplement (prorated for service less than 5 years).

Tier B

The retirement benefit equals 2-1/2% multiplied by average monthly earnings multiplied by credited service limited to a maximum of 40 years (no monthly health supplement).

Form of Payment:

Tier A

An unreduced pension benefit under a joint and one-half survivor option with 10 years guaranteed or a ten-year certain and life option. An actuarially equivalent joint and full survivor option is also available.

Tier B

An unreduced pension payable for life with 10 years guaranteed. Actuarially equivalent joint and survivor options (50% and 100%) are also available.



SUMMARY OF BENEFIT PROVISIONS (cont.)

Early Retirement Factors:

Tier A

For members retiring prior to age 50 with 30 or more years of service the pension shall be multiplied by the following percentage:

<u>Age</u>	<u>Percentage</u>
49	93.3
48	87.2
47	81.5
46	76.3
45	71.5
44	67.0

Tier B

For members retiring prior to age 65 with less than 40 years of service, the pension shall be multiplied by the following percentage:

<u>Age</u>	<u>Percentage</u>	<u>Age</u>	<u>Percentage</u>
64	89.72	56	40.03
63	80.66	55	36.41
62	72.64	54	33.15
61	65.53	53	30.22
60	59.21	52	27.57
59	53.58	51	25.18
58	48.56	50	23.01
57	44.06	49	21.05

Deferred Retirement

Eligibility: Deferred retirement pension benefit commencing at age 60 for Tier A members or at age 65 for Tier B members, with at least five (5) years of credited service, and accumulated contributions are left on deposit with the Fund.

Monthly Benefit: The deferred retirement benefit is equal to the retirement pension based on earnings and credited service at the time of termination.

SUMMARY OF BENEFIT PROVISIONS (cont.)

Disability Retirement Pension

Non-Service Disability:

1. Eligibility: Five (5) years of service and totally and permanently incapacitated for duty.
2. Monthly Benefit: Computed based on average monthly earnings and credited service at time of disability but not less than 10 times the percentage multiplier multiplied by the average monthly earnings.

Service Disability:

1. Eligibility: Totally and permanently incapacitated from the further performance of duty as a result of injury while in the course of employment for the City.
2. Monthly Benefit: Calculated as a non-service disability pension but not less than \$1,000 per month.

Death Benefits

Eligibility: active or inactive members who die prior to retirement

Benefit: For members with less than 2 years of service or inactive member with less than 5 years of service: refund of the members contributions.

Benefit: For members with more than 2 years of service but less than 15 years of service: an unreduced pension to designated beneficiary for 120 months or a one-half survivor option for life with 120 payments guaranteed.

Benefit: For members eligible for retirement or members and inactive members with more than 15 years of service: an unreduced pension to designated beneficiary for 120 months or a Full Survivor option for life with 120 payments guaranteed.

Form: Benefit paid in accordance with the option on file, or the eligible option, or if no eligible beneficiary, a lump sum equivalent of 10 years of benefit payments to the member's estate.

Minimum Benefit for Service Death: For job-related death a minimum of 10 years of service used in calculation of benefit. Benefit will not be less than \$1,000 per month.



SUMMARY OF BENEFIT PROVISIONS (cont.)

Return of Accumulated Contributions

A member at the time of termination is entitled to be paid accumulated contributions without interest.

Cost-of-Living Adjustments

An annual cost-of-living adjustment to the base pension benefit shall be made based on the greater of:

Tier A

- a. The percentage of change in the price index for October of the current year over October of the previous year, up to 5%, or
- b. The percentage of annual average change in the price index for the 12-month period ending with the effective date of the adjustment, up to 5%.

Tier B

- c. The percentage of change in the price index for October of the current year over October of the previous year, up to 3%, or
- d. The percentage of annual average change in the price index for the 12-month period ending with the effective date of the adjustment, up to 3%.