

City of Richmond Heights Policemen's and Firemen's Retirement Fund

Annual Actuarial Valuation
as of July 1, 2019



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Section 1

Introduction and Comments

A. Introduction

This report was prepared at the request of the Board and is intended for use by the Retirement Fund and those designated or approved by the Board. This report may be provided to parties other than the Fund only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

An actuarial valuation of the City of Richmond Heights Policemen's and Firemen's Retirement Fund was performed as of July 1, 2019 for the Plan years ending June 30, 2020 and June 30, 2021. The purpose of this valuation is to determine (i) the position of the Trust Fund, (ii) the minimum contribution required to comply with the Board's funding policy, and (iii) certain information which may be required by the City's auditors. This report should not be relied on for any purpose other than the purpose described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The computed contribution rate shown on page 22 may be considered as a minimum contribution rate that complies with the Board's funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section 3 of this report. This report includes risk metrics on pages 7 through 9, but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

The valuation was based upon information furnished by the City, concerning Retirement Fund benefits, financial transactions, fund 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 the City.

Section 2 gives a summary of valuation results. A discussion of the results is given in the Comments portion of this Section.

The valuation was based on the following:

- (a) Actuarial assumptions with respect to the rate of investment return, the rate of salary increases, the rate of cost-of-living increases, and probabilities of death, withdrawal, retirement and disability. These actuarial assumptions, along with an explanation of the actuarial cost method, are set forth in Section 3.
- (b) The principal provisions of the Fund as in effect on July 1, 2019. These provisions of the Fund are summarized in Section 4.

Section 1

Introduction and Comments (Continued)

- (c) Financial information on the Trust Fund supplied by the Finance Director is summarized in Section 5.
- (d) Employee data furnished by the City as of July 1, 2019. This employee data, along with data on Retired Participants and Beneficiaries receiving benefits is summarized in Section 2.

The Funded Ratio, which is a measurement of the funding status of the Fund, is shown in Section 6. As of July 1, 2019, the funded ratio is 121% as compared to 123% on July 1, 2017. This measure of the Fund's funded position is not an appropriate measurement for assessing the sufficiency of plan assets to cover the estimated cost of settling the Fund's benefit obligation.

The results of the valuation and the development of the costs for the year are shown in Section 7.

B. Comments

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: fund experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; 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 fund's funded status); and changes in fund provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

This valuation assumed the continuing ability of the Fund sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

There were no Fund provision changes that impacted the results of this report. However, several changes were made to the Fund's actuarial assumptions which are described below:

- The interest rate assumption was changed from 6.5% to 6.0% (an increase to liabilities).
- Future mortality improvements are projected on a fully generational basis using MP-2014 (an increase to liabilities). Formerly, mortality improvements were projected from the mortality table base year of 2006 to the valuation year with MP-2014.
- The assumed salary increase for active, and thus the assumed COLA for eligible retirees, was reduced from 5% to 4% per year (a decrease to liabilities).

Valuation assets are approximately 100% of market value (a difference of about \$28,000). If valuation assets were set equal to market value the funded ratio would remain at 121% and the actuarially determined contribution would remain about the same. Without near term investment gains above 6.0%, valuation assets will be above market value, and the computed contributions are expected to decrease for the next biennial report as of July 1, 2021.

Section 1

Introduction and Comments (Concluded)

This report has been prepared by actuaries who have substantial experience valuing public employee retirement funds. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the City of Richmond Heights Policemen's and Firemen's Retirement Fund as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. This report was prepared using certain assumptions approved by the Board as described in Section 3 of this report. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

It is the actuary's opinion that the contribution rates determined by this actuarial valuation are sufficient to meet the Fund's benefit obligations, presuming continued timely receipt of actuarially determined contributions. Given the Fund's contribution allocation procedure, if all actuarial assumptions are met, it is expected that:

1. The employer normal cost as a percentage of payroll will remain level and will be sufficient to cover the cost of benefits accruing during each year.
2. The unfunded actuarial liabilities will continue to be less than or equal to \$0.
3. The funded status will continue to be greater than or equal to 100%.

Brad Lee Armstrong, Abra D. Hill and Derek Henning are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

The signing actuaries are independent of the Fund sponsor.

Respectfully submitted,



Brad L. Armstrong, ASA, EA, FCA, MAAA



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Section 2

Summary of Valuation Results

	<u>July 1, 2017*</u>	<u>July 1, 2019</u>	<u>July 1, 2019*</u>
A. Summary of Data			
(1) Participants			
(a) Active			
Non-Vested	39	36	36
Vested	23	25	25
Total	62	61	61
(b) Retirees			
(c) Disabled			
(d) Beneficiaries			
(e) Vested Terminated			
(f) Total Inactive			
(g) Total Participants			
(2) Average Monthly Benefit			
(a) Retirees	\$ 4,279	\$ 4,566	\$ 4,566
(b) Disabled	4,037	4,475	4,475
(c) Beneficiaries	1,622	1,731	1,731
(d) Vested Terminated	1,373	0	0
(3) Covered Compensation			
(a) Average Compensation	4,490,233	4,515,635	4,515,635
B. Summary of Assets			
(1) Market Value	\$53,271,765	\$57,848,027	\$57,848,027
(2) Actuarial Value	53,269,073	57,875,685	57,875,685
C. Computed Contributions			
(1) Unfunded Actuarial Accrued Liability	-	-	-
(2) City Normal Cost	1,121,000	1,118,819	1,126,456
(3) Actuarially Determined Contribution	1,121,000	1,118,819	1,126,456
(4) Expected Tax Revenue	991,515	991,515	991,515

* After changes in benefit provisions, or actuarial assumptions and methods.



Section 2 Data Reconciliation

	<u>Active</u>	<u>Deferred</u>	<u>Retirees</u>	<u>Beneficiaries</u>	<u>Disabled</u>	<u>Total</u>
July 1, 2017	62	1	28	6	6	103
Valuation Adjustment						0
New Disabled Participant(s)	(1)				1	0
New Retired Participant(s)	(1)	(1)	2	1		1
New Deferred Participant(s)						0
Terminated Non-Vested*	(13)					(13)
Deaths			(2)	(1)		(3)
New Entrants/Additions*	14					14
July 1, 2019	61	0	28	6	7	102

* Includes 5 members who were hired and terminated between the valuation dates.

Section 2

Active Participants July 1, 2019 by Near Age and Years of Service

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19									
20-24	1							1	\$ 59,779
25-29	7	1	1					9	545,964
30-34	4	3						7	446,618
35-39	1	4						5	336,028
40-44	1	2	2	2	1			8	595,578
45-49		3	3	3	4			13	985,344
50-54		1		2	2	2	1	8	714,114
55-59					4	2	1	7	605,126
60+			2			1		3	221,844
Totals	14	14	8	7	11	5	2	61	\$ 4,510,395

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 43.2 years
Service: 12.8 years
Annual Pay: \$73,941

Section 2

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

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 Risk** – 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; and
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.

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.

Section 2

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution (Continued)

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. Generally accepted plan maturity measures include the following:

	2019	2017	2015	2013
Ratio of the market value of assets to payroll	12.81	11.86	11.65	8.87
Ratio of actuarial accrued liability to payroll	10.58	9.67	8.77	8.14
Ratio of retiree actuarial accrued liability to total liability	54%	52%	50%	38%
Ratio of actives to retirees and beneficiaries	1.49	1.51	1.63	1.88
Ratio of net cash flow to market value of assets	-1.5%	-1.7%	-0.6%	-0.2%
Duration of actuarial accrued liability*	16.06			

* Not measured before the 2019 valuation.

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 12.0 times the payroll, a return on assets 5% different than assumed would equal 60% 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.

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 10.0 times the payroll, a change in liability 2% other than assumed would equal 50% 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.

Section 2

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution (Concluded)

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 Actuarial Accrued Liability

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 16 indicates that the liability would increase approximately 16% if the assumed rate of return were lowered 1%.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. 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.

Section 3

Actuarial Cost Method and Assumptions

A. Actuarial Cost Method

The actuarial cost method used to determine the annual cost of the Fund is a projected benefit, level cost with supplemental liability cost method which is usually referred to as the Entry Age Actuarial Cost Method. Under this method, there is an allocation of costs between past and future service at the time of each actuarial valuation of the Fund.

The portion of the Fund's cost allocated to past service is known as the Actuarial Accrued Liability. Supplements to the Actuarial Accrued Liability may be established as a result of actuarial gains or losses, Fund amendments and changes in the actuarial assumptions or actuarial cost method. The Unfunded Actuarial Accrued Liability represents the progress that has been made in amortizing the Actuarial Accrued Liability. The contribution each year, in excess of the amount needed to pay the annual Normal Cost, is first used to pay interest accruing on the Unfunded Actuarial Accrued Liability and then to reduce the Unfunded Actuarial Accrued Liability. If actual experience varies from the actuarial assumptions, actuarial gains (or losses) will arise. Actuarial gains (or losses) result in a decrease (or increase) in the Unfunded Actuarial Accrued Liability.

The portion of the Fund's cost allocated to future service is reflected in the annual Normal Cost for the current and future years. The annual Normal Cost each year is determined as follows:

- (a) The Actuarial Present Value of Future Benefits is determined as the amount currently needed to fund all benefits that may become payable under the Fund. The actuarial assumptions relating to mortality, turnover, disability and retirement are used to calculate the benefits expected to be paid and then the assumed interest rate is used to discount these expected future benefit payments back to the present time.
- (b) The Actuarial Present Value of Future Benefits is determined at an employee's entry age. Entry age is established by subtracting credited service from current age on the valuation date. The Actuarial Present Value of Future Benefits at entry age is then divided by the Actuarial Present Value of the employee's future compensation to determine the Normal Cost for the individual employee. The sum of all the individual Normal Costs is the annual Normal Cost for the Plan Year.
- (c) The Present Value of Future Normal Costs is determined by multiplying the average annual Normal Cost rate by the Actuarial Present Value of the Future Compensation of all employees in the Fund. The Actuarial Accrued Liability is obtained by subtracting the Actuarial Present Value of Future Normal Costs from the Actuarial Value of Future Benefits. This difference is equal to the annual Normal Costs that have accrued for each employee in the Fund.
- (d) The Unfunded Actuarial Accrued Liability is obtained by subtracting the Actuarial Value of Assets from the Actuarial Accrued Liability. The Actuarial Value of Assets is the cost of the assets.

Section 3

Actuarial Cost Method and Assumptions (Continued)

Section 7 shows the determination of the annual Normal Cost and Unfunded Actuarial Accrued Liability for the current Plan Year.

B. Actuarial Assumptions

Actuarial assumptions are based on a combination of future expectations and historical data.

The following actuarial assumptions were used in the valuation:

Interest	6.0% per annum.
Price Inflation	2.5% per annum.
Salary Increase	Compensation is assumed to increase at the rate of 4.0% per year. 2.5% for wage inflation and 1.5% for promotion and merit.
Mortality	The RP-2014 Blue Collar Healthy Annuitant Mortality Table made fully generational with MP-2014 Mortality Improvement Scale.
Disability Mortality	The RP-2014 Disabled Mortality Table made fully generational with MP-2014 Mortality Improvement Scale.
Pre-Retirement Mortality	The RP-2014 Blue Collar Employee Mortality Table made fully generational with MP-2014 mortality improvement scale. One-third of the deaths are assumed to be non-duty related.
Terminations	Graduated rates, as illustrated on the next page.
Disabilities	Graduated rates, as illustrated on the next page. One-third of the disabilities are assumed to be non-duty related.
Retirement	A rate of 75% upon reaching 30 years of service or age 60 with 15 years of service; rates of 10% per year for each year after 30 years to age 61; a rate of 25% at age 62 (40% with 30 years of service), 10% at age 63, 15% at age 64 (20% with 30 years of service), and a rate of 100% for age 65 and over.

The interest rate assumption, the mortality assumption and the assumption for salary increases were updated for the July 1, 2019 valuation.

Section 3

Actuarial Cost Method and Assumptions (Concluded)

Expenses

Interest rate assumed to be net of expenses.

Cost-of-Living

Participants and beneficiaries in pay status prior to July 1, 1987 are assumed to receive 4% cost-of-living increases per year. After July 1, 1987, 4.0% to SS NRA for retirees. Surviving Spouse annual benefit adjustments do not cease or depend on the member's age at death.

Age	Male Annuitant Mortality		Female Annuitant Mortality		Terminations	Disabilities
	Service	Disability	Service	Disability		
25	0.060%	0.158%	0.023%	0.074%	10.000%	0.150%
30	0.086%	0.420%	0.043%	0.225%	7.800%	0.180%
35	0.116%	0.740%	0.067%	0.387%	4.900%	0.230%
40	0.145%	0.945%	0.094%	0.501%	3.100%	0.300%
45	0.201%	1.171%	0.149%	0.701%	2.300%	0.510%
50	0.312%	1.497%	0.252%	1.035%	2.300%	1.000%
55	0.524%	1.981%	0.372%	1.320%	2.100%	1.550%
60	0.761%	2.352%	0.475%	1.376%	1.500%	0.000%
65	1.043%	2.567%	0.664%	1.531%	1.500%	0.000%

Age	Future Life Expectancy (Years)			
	Male		Female	
	Healthy	Disabled	Healthy	Disabled
40	46.58	36.03	49.85	41.98
45	41.41	32.03	44.61	37.38
50	36.36	28.27	39.48	33.01
55	31.51	24.84	34.50	28.98
60	26.94	21.79	29.72	25.28
65	22.56	18.77	25.10	21.61
70	18.39	15.69	20.67	17.96
75	14.50	12.65	16.50	14.48
80	10.98	9.81	12.68	11.34

C. Actuarial Asset Valuation Method

The actuarial asset valuation method is based on the principle that the difference between actual and expected investment returns should be subject to partial recognition to smooth out fluctuations in the total return achieved by the fund from year to year. Under this method, the actuarial value of assets reflects annually one-fourth of the market value gains or losses for the four prior years. The resulting value is restricted to not be less than 80% of market value nor greater than 120% of market value.



Section 3

Miscellaneous and Technical Assumptions

Pay Increase Timing. Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

Decrement Timing. Decrements of all types are assumed to occur mid-year.

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

Benefit Service. Exact fractional service is used to determine the amount of benefit payable.

Decrement Relativity. Decrement rates are used directly, without adjustment for multiple decrement table effects.

Decrement Operation. Disability and withdrawal do not operate during retirement eligibility.

Normal Form of Benefit. The assumed normal form of benefit is 25% joint and survivor.

Loads. None.

Incidence of Contributions. Contributions are assumed to be received monthly throughout the year based upon the computed contributions shown in this report.

Section 3

Definitions of Technical Terms

Accrued Service. Service credited under the fund which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability. The difference between the actuarial present value of fund benefits and the actuarial present value of future normal costs. Also referred to as “past service liability.”

Actuarial Assumptions. Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future benefits” between future normal costs and actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

Actuarial Equivalent. One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

Actuarial Gain (Loss). The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities -- during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payments.

Amortization. Paying off an interest-discounted amount with periodic payments of interest and (generally) principal -- as opposed to paying off with a lump sum payment.

Normal Cost. The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as “current service cost.”

Unfunded Actuarial Accrued Liabilities. The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as “unfunded past service liability” or “unfunded supplemental present value.”

Most retirement funds have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs.

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

Section 4

Summary of the Principal Provisions of the Fund as of July 1, 2019 (Continued)

(7) Non-Duty Disability Retirement Benefit

Eligibility: Permanent and total disability not resulting from the performance of duties after two years of service.

Form: Same as Duty Disability Retirement Benefit.

Amount: Greater of:

- (1) 25% of Retirement Base Pay; or
- (2) 70% of Retirement Base Pay reduced proportionately for less than 30 years of service.
- (3) Plus a refund of employee contributions without interest at age 60 or the 30th Anniversary of hire date, whichever is sooner.

(8) Funeral Death Benefit

Eligibility: Death of any active, deferred vested, or retired participant.

Form: Lump sum payment.

Amount: \$5,000.

(9) Duty Death Benefit

Eligibility: Death resulting from the performance of duties.

Form: Monthly annuity. Widow's payments cease upon earlier of death or remarriage. Children's payments cease upon earlier of death, marriage, or attainment of age 20.

Amount: 50% of Retirement Base Pay for eligible widow, plus an additional 5% of each unmarried child under age 20.

(10) Non-Duty Death Benefit

Eligibility: (1) Death of an active participant not resulting from performance of duties; or

(2) Death of a retired participant.

Form: Monthly annuity. Widow's payments cease upon earlier of death or remarriage. Children's payments cease upon earlier of death, marriage, or attainment of age 20.

Amount: 25% of Retirement Base Pay for eligible widow, plus an additional 5% for each unmarried child under age 20, subject to a total maximum of 50% of Base Pay.

Section 4

Summary of the Principal Provisions of the Fund as of July 1, 2019 (Continued)

(11) Contributions

Employee: 3% of Base Pay. If at any time subsequent to April 7, 2003, the Fund's funded status falls below 90%, contributions will be increased to 4% of Base Pay.

Employer:		Per \$100 of Assessed Value
	Residential Property	\$ 0.303
	Commercial Property	0.320
	Personal Property	0.318

(12) Refund of Contributions - Termination

Eligibility: A participant who leaves the service of the City for any reason when no other benefit is payable.

Amount: Return of participant's contributions, plus interest credited at 5.0% per year.

For Employees hired after February 5, 2016, contributions are refunded with 5.0% interest during employment and 0.0% interest after resignation or termination from the City.

(13) Refund of Contributions – Death or Retirement

Eligibility: (a) Participants who retire on account of age and service or disability.
(b) Participants who die while active or while receiving a disability pension.

Amount: (a) A one-time lump sum equal to the participants accumulated employee contributions, without interest, is payable after retirement at the earlier of age 60 or the 30th anniversary of employment.
(b) A one-time lump sum equal to the participant's accumulated contributions, without interest, is payable upon the death of the participant.

(14) Reduction of Benefits

Fund benefits to retired and disabled participants are reduced by the amount of any workers compensation benefits or Social Security benefits payable to the participant upon initial eligibility. Increases in Social Security benefits subsequent to initial eligibility do not reduce Fund benefits. For participants in active service after July 2, 2000 and who retire subsequent to July 2, 2000, Fund benefits are reduced by 50% of Social Security benefits. For participants in active service after May 8, 2003 and who retire subsequent to May 8, 2003, Fund benefits will not be reduced by Social Security benefits.

Section 4

Summary of the Principal Provisions of the Fund as of July 1, 2019 (Concluded)

(15) Post-Retirement Benefit Increases

Benefits in pay status prior to July 1, 1987 are automatically increased to reflect changes in Base Pay.

Benefits entering pay status after June 30, 1987 are automatically adjusted by the average per active participant increase in Base Pay of the entire Police and Fire departments during the previous fiscal year up to the age the participant qualifies for full (100%) Social Security benefits. Surviving spouse annual benefit adjustments do not cease or depend on the member's age at death.

Section 5 Asset Development

Valuation Date July 1,	2016	2017	2018	2019	2020	2021	2022
A. Funding Value Beginning of Year	\$46,440,513	\$49,448,855	\$53,269,073	\$55,534,044			
B. Market Value End of Year	47,521,800	53,271,765	56,793,265	57,848,027			
C. Market Value Beginning of Year	48,876,725	47,521,800	53,271,765	56,793,265			
D. Non-Investment/Administrative Net Cash Flow	(686,521)	(901,751)	(747,042)	(863,381)			
E. Investment Return:							
E1. Market Total: B-C-D	(668,404)	6,651,716	4,268,542	1,918,143			
E2. Assumed Rate	7.00%	7.00%	6.50%	6.50%	6.00%		
E3. Amount for Immediate Recognition	3,227,214	3,430,392	3,438,593	3,582,095			
E4. Amount for Phased-in Recognition	(3,895,618)	3,221,324	829,949	(1,663,952)			
F. Phased-In Recognition of Investment Return:							
F1. Current Year: 0.25 x E4	(973,905)	805,331	207,487	(415,988)			
F2. First Prior Year	(465,495)	(973,905)	805,331	207,487	\$ (415,988)		
F3. Second Prior Year	1,925,647	(465,495)	(973,905)	805,331	207,487	\$ (415,988)	
F4. Third Prior Year	(18,598)	1,925,646	(465,493)	(973,903)	805,331	207,488	\$ (415,988)
F5. Total Recognized Investment Gain	467,649	1,291,577	(426,580)	(377,073)	596,830	(208,500)	(415,988)
G. Valuation Assets							
G1. Preliminary Valuation Assets: A+D+E3+F5	49,448,855	53,269,073	55,534,044	57,875,685			
G2. Market Value Corridor	20%	20%	20%	20%			
G3. Upper Corridor Limit = (100%+G2)*B	57,026,160	63,926,118	68,151,918	69,417,632			
G4. Lower Corridor Limit = (100%-G2)*B	38,017,440	42,617,412	45,434,612	46,278,422			
G5. Adjustment to Remain within Corridor	0	0	0	0			
G6. Valuation Assets	49,448,855	53,269,073	55,534,044	57,875,685			
H. Difference Between Funding & Market Values	1,927,055	(2,692)	(1,259,221)	27,658			
I. Funding Value Rate of Return	8.0%	9.6%	5.7%	5.8%			
J. Market Value Rate of Return	(1.4%)	14.1%	8.1%	3.4%			
K. Ratio of Funding Value to Market Value	104.1%	100.0%	97.8%	100.0%			

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, the Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, the Funding Value of Assets will tend to be greater than Market Value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to Market Value.



Section 5 Financial Information Submitted by the City

Market Value July, 1, 2017		\$ 53,271,765
Market Value Adjustment		<u>-</u>
Adjusted Market Value July, 1, 2017		53,271,765
 Additions		
Investment Income		
Interest and Dividends Earned	\$	1,043,354
Net Appreciation in Fair Value of Investments		<u>5,528,115</u>
Total Investment Income		6,571,469
Less - Investment Management and Custodial Fees		<u>332,651</u>
Net Investment Income		<u>6,238,818</u>
Contributions		
Employer		2,054,013
Employee		<u>278,075</u>
Total Contributions		<u>2,332,088</u>
Total Additions		<u>8,570,906</u>
 Deductions		
Benefit Payments		3,942,511
Administration		<u>52,133</u>
Total Deductions		<u>3,994,644</u>
Change in Net Position		<u>4,576,262</u>
Market Value July, 1, 2019	\$	<u><u>57,848,027</u></u>

Section 6

Actuarial Accrued Liability

The actuarial accrued liability is a measure intended to help users assess (i) a pension fund's funded status on a going concern basis, and (ii) progress being made toward accumulating the assets needed to pay benefits as due. Allocation of the actuarial present value of projected benefits between past and future service was based on the individual entry-age actuarial cost method. Assumptions, including projected pay increases, were the same as used to determine the Retirement Fund's level percent-of-payroll actuarially determined contribution between entry-age and assumed exit age. Entry-age was established by subtracting credited service from current age on the valuation date.

The entry age actuarial accrued liability was determined as part of an actuarial valuation of the Fund as of July 1, 2019. Significant actuarial assumptions used in determining the entry age actuarial accrued liability include (a) a rate of return on the investment of present and future assets of 6.0% per year compounded annually, (b) projected salary increases of 4.0% per year compounded annually (2.5% for wage inflation and 1.5% for promotion and merit), and (c) participants and beneficiaries in pay status prior to July 1, 1987 are assumed to receive 4% cost-of-living increases per year. After July 1, 1987, 4.0% per year prior to the age the participant qualifies for 100% SS Benefits. Surviving Spouse cost-of-living increases continue until death.

At July 1, 2019, the unfunded actuarial accrued liability was \$(10,113,097) determined as follows:

Actuarial Accrued Liability	
Active participants (25 vested and 36 non-vested)	\$ 22,173,935
Retired participants and beneficiaries currently receiving benefits (41 recipients)	25,588,653
Vested terminated participants not yet receiving benefits (0 vested)	0
Total Actuarial Accrued Liability	47,762,588
Actuarial Value of Assets (smoothed market value)	57,875,685
Unfunded Actuarial Accrued Liability	\$ (10,113,097)
Funded Ratio	121%

During the period from July 1, 2017 to July 1, 2019, the Fund experienced a net change of \$4.4 million in the actuarial accrued liability, of which, \$2.5 million was due to changes in actuarial assumptions and methods.

Section 7

Valuation Results and Determination of the Contribution

	<u>July 1, 2017*</u>	<u>July 1, 2019</u>	<u>July 1, 2019*</u>	<u>July 1, 2020</u>
(1) Actuarial Present Value of future benefits to:				
(a) Active participants	\$32,117,140	\$32,187,056	\$32,912,241	
(b) Retired participants and beneficiaries	22,423,329	24,004,765	25,588,653	
(c) Vested terminated participants	227,758	0	0	
Total	<u>\$54,768,227</u>	<u>\$56,191,821</u>	<u>\$58,500,894</u>	
(2) Annual Normal Cost, adjusted with valuation interest to the end of the Plan year				
(a) City normal cost	1,121,000	1,118,819	1,126,456	1,154,617
(b) Employee normal cost	146,536	146,187	144,109	147,712
(3) Covered compensation	4,490,233	4,515,635	4,515,635	4,628,526
(4) Annual City Normal Cost Accrual Rate: (2)(a) / (3)	24.97%	24.78%	24.95%	24.95%
(5) Actuarial Present Value of future City Normal Costs	10,047,652	9,653,025	9,521,817	
(6) Actuarial Present Value of future employee contributions	1,310,549	1,266,378	1,216,489	
(7) Actuarial Accrued Liability: (1) – (5) – (6)	43,410,026	45,272,418	47,762,588	49,393,506
(8) Actuarial Value of Assets	53,269,073	57,875,685	57,875,685	60,448,758
(9) Unfunded Actuarial Accrued Liability: (7) – (8), not less than zero	0	0	0	0
(10) Annual payment to amortize the Unfunded Actuarial Accrued Liability over 30 years from July 1	0	0	0	0
(11) Actuarially determined contribution: (2)(a) + (10)	1,121,000	1,118,819	1,126,456	1,154,617

* After changes in benefit provisions, or actuarial assumptions and methods.



Section 8

Schedule of Funding Progress

(\$ in hundreds)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (b)-(a)	Funded Ratio (a)/(b)	Active Member Covered Payroll (c)	Unfunded AAL as a Percentage of Active Member Covered Payroll ((b-a)/c)
7/1/2007 *	\$27,633	\$25,714	\$ (1,919)	107 %	\$3,699	(52) %
7/1/2009	30,050	26,679	(3,371)	113	3,801	(89)
7/1/2011 *	32,328	32,833	505	98	4,012	13
7/1/2013	37,744	34,594	(3,150)	109	4,249	(74)
7/1/2015 *	46,441	36,813	(9,628)	126	4,196	(229)
7/1/2017 *	53,269	43,410	(9,859)	123	4,490	(220)
7/1/2019 *	57,876	47,763	(10,113)	121	4,516	(224)

* After changes in benefit provisions and/or actuarial assumptions and methods.

Analysis of the dollar amounts of actuarial value of assets, actuarial accrued liability, or unfunded actuarial accrued liability in isolation can be misleading. Expressing the actuarial value of assets as a percentage of the actuarial accrued liability provides one indication of the Fund's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the Fund is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the Fund. The unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the Fund.

Schedule of Employer Contributions

Fiscal Year Ending 6/30	Valuation Date 7/1	Actuarially Determined Contributions	Percentage Contributed
2014	2013*	\$ 912,638	107 %
2015	2013*	944,580	103
2016	2015	893,725	109
2017	2015	920,537	101
2018	2017	1,121,000	91
2019	2017	1,154,630	89
2020	2019	1,126,456	
2020	2019*	1,154,617	

* The Actuarially Determined Contributions and Percentage Contributed have been adjusted from the indicated valuation to only show the City portion of contributions.

