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City of Roseville Employees Retirement System

June 30, 2019 | Actuarial Valuation Report

Nyhart Actuary & Employee Benefits

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Actuarial Certification

At the request of the plan sponsor, this report summarizes City of Roseville Employees Retirement System as of June 30, 2019. The purpose of this report is to communicate the following results of the valuation:

- Determine Funded Status; and
- Determine Recommended Contribution for the fiscal year July 1, 2020 through June 30, 2021.

This report has been prepared in accordance with the applicable Federal and State laws. Consequently, it may not be appropriate for other purposes. Please contact Nyhart prior to disclosing this report to any other party or relying on its content for any purpose other than that explained above. Failure to do so may result in misrepresentation or misinterpretation of this report.

The results in this report were prepared using information provided to us by other parties. The census information has been provided to us by the employer. Asset information has been provided to us by the trustee. We have reviewed the provided data for reasonableness when compared to prior information provided, but have not audited the data. Where relevant data may be missing, we have made assumptions we believe to be reasonable. We are not aware of any significant issues with and have relied on the data provided. Any errors in the data provided may result in a different result than those provided in this report. A summary of the data used in the valuation is included in this report.

The actuarial assumptions and methods were chosen by the Board. In our opinion, all actuarial assumptions and methods are individually reasonable and in combination represent our best estimate of anticipated experience of the plan. 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;
- 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); and
- changes in plan provisions or applicable law.

We did not perform an analysis of the potential range of future measurements due to the limited scope of our engagement. This report has been prepared in accordance with generally accepted actuarial principles and practice.

This actuarial valuation and/or cost determination was prepared and completed by me or under my direct supervision, and I acknowledge responsibility for the results. To the best of my knowledge, the results are complete and accurate, and in my opinion, the techniques and assumptions used are reasonable.

Actuarial Certification

Neither Nyhart nor any of its employees have any relationship with the plan or its sponsor which could impair or appear to impair the objectivity of this report. To the extent that this report or any attachment concerns tax matters, it is not intended to be used and cannot be used by a taxpayer for the purpose of avoiding penalties that may be imposed by law.

The undersigned are compliant with the continuing education requirements of the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States and are available for any questions.

Nyhart



Nick Meggos, EA, FCA
Enrolled Actuary No. 17-7406

March 27, 2020
Date



Danielle Winegardner, FSA, EA, MAAA
Enrolled Actuary No. 17-8260

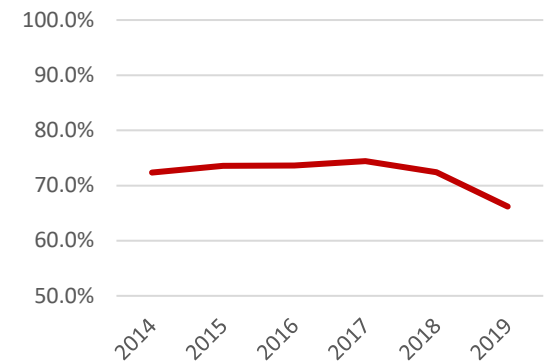
Executive Summary

Summary Results

The actuarial valuation's primary purpose is to produce a scorecard measure displaying the funding progress of the plan toward the ultimate goal of paying benefits at retirement. The accrued liability is based on an entry age level percentage of pay.

	June 30 , 2018	June 30, 2019
Funded Status Measures		
Accrued Liability	\$190,828,284	\$208,703,541
Actuarial Value of Assets	\$138,192,403	\$138,141,096
Unfunded Accrued Liability	\$52,635,881	\$70,562,445
Funded Percentage (AVA)	72.4%	66.2%
Funded percentage (MVA)	73.1%	66.1%
Interest Rate	7.50%	7.50%
Cost Measures		
Recommended Total Contribution	\$5,913,711	\$6,553,526
Recommended Contribution (as a percentage of payroll)	37.9%	38.7%
Asset Performance		
Market Value of Assets	\$139,401,081	\$138,007,844
Actuarial Value of Assets	\$138,192,403	\$138,141,096
Actuarial Value/Market Value	99.1%	100.1%
Member Information		
Active Members	226	228
Terminated Vested Members	8	11
Retirees, Beneficiaries, and Disabled Members	369	376
Total	603	615
Covered Payroll	\$15,613,937	\$16,938,988

History of Funded Ratio



Changes Since Prior Valuation and Key Notes

There have been no changes to the plan provisions since the last valuation.

Effective June 30, 2019, there was a change in firm and enrolled actuary for the plan. The methods are substantially the same and the accrued liability, normal cost, and plan assets for the prior year are within 5%. Results from June 30, 2018 and prior plan years shown in this report were obtained from valuation results prepared by Rodwan Consulting Company.

The mortality assumption was changed to RP-2006 Mortality with Scale MP-2019 to be consistent with GASB 67/68 Reporting. The RP-2006 Disabled Mortality Table with scale MP-2019 was also added to value disabled participants. This caused an increase to liability and contribution requirements.

The following changes were made to the development of the recommended contribution as of June 30, 2019. In combination, these changes resulted in a decrease to the recommended contribution.

- The Unfunded Actuarial Accrued Liability that is amortized was reduced by the present value of the anticipated 2019 Plan contribution
- The amortization period was increased from 15 years to 25 years
- The payroll growth assumption was lowered from 5.00% to 3.00% to better reflect anticipated plan experience
- A load for anticipated administrative expenses of \$200,000 was added to the contribution development
- The recommended contribution is expected to be made on September 30, 2020. The recommended contribution was adjusted to reflect 1.25 years of interest

Historical Valuation Summary

	06/30/2015	06/30/2016	06/30/2017	06/30/2018	06/30/2019
Funding					
Actuarial Accrued Liability	\$183,739,084	\$185,829,867	\$187,256,512	\$190,828,284	\$208,703,541
Actuarial Value of Assets	\$135,185,592	\$136,875,943	\$139,364,686	\$138,192,403	\$138,141,096
Unfunded Actuarial Accrued Liability	\$48,553,492	\$48,953,924	\$47,891,826	\$52,635,881	\$70,562,445
Funded Percentage	73.6%	73.7%	74.4%	72.4%	66.2%
Total Normal Cost	\$3,123,729	\$3,159,982	\$3,132,917	\$3,243,615	\$3,165,407
Actual Contributions	\$5,094,075	\$4,872,123	\$5,106,579	\$5,245,221	\$5,460,962
Recommended Contribution	\$5,094,075	\$4,872,123	\$5,106,579	\$5,245,221	\$5,332,723
Interest Rate	7.50%	7.50%	7.50%	7.50%	7.50%
Rate of Return					
Actuarial Value of Assets	7.6%	7.0%	7.6%	5.6%	6.1%
Demographic Information					
Active Participants	228	233	229	226	228
Terminated Vested Participants	18	18	12	8	11
Retired, Disabled, and Beneficiaries	359	360	366	369	376
Total Participants	605	611	607	603	615
Covered Payroll	\$13,868,957	\$14,814,074	\$14,736,319	\$15,613,937	\$16,938,988
Average Covered Pay	\$60,829	\$63,580	\$64,351	\$69,088	\$74,294

Identification of Risks

The results presented in this report are shown as single point values. However, these values are derived using assumptions about future markets and demographic behavior. If actual experience deviates from our assumptions, the actual results for the plan will consequently deviate from those presented in this report. Therefore, it is critical to understand the risks facing this pension plan. The following table shows the risks we believe are most relevant to the City of Roseville Employees Retirement System. The risks are generally ordered with those we believe to have the most significance at the top. Also shown are possible methods by which a more detailed assessment of the risk can be performed.

Type of Risk	Method to Assess Risk
Investment Return	Scenario Testing; Asset Liability Study
Demographic Risk	Scenario Testing; Stress Testing; Experience Study
Participant Longevity	Stress Testing; Experience Study
Salary Growth	Scenario Testing; Experience Study; Review Future Budgets

Plan Maturity Measures – June 30, 2019

Each pension plan has a distinct life-cycle. New plans promise future benefits to active employees and then accumulate assets to pre-fund those benefits. As the plan matures, benefits are paid and the pre-funded assets begin to decumulate until ultimately, the plan pays out all benefits. A plan's maturity has a dramatic influence on how risks should be viewed. The following maturity measures illustrate where the City of Roseville Employees Retirement System falls in its life-cycle.

Duration of Liabilities: 9.7%

Duration is the most common measure of plan maturity. It is defined as the sensitivity of the liabilities to a change in the interest rate assumption. The metric also approximates the weighted average length of time, in years, until benefits are expected to be paid. A plan with high duration is, by definition, more sensitive to changes in interest rates. A plan with low duration is more susceptible to risk if asset performance deviates from expectations as there would be less time to make up for market losses in adverse market environments while more favorable environments could result in trapped surplus from gains. Conversely, high duration plans can often take on more risk when investing, and low duration plans are less sensitive to interest rate fluctuations.

Demographic Distribution - Ratio of Actively Accruing Participants to All Participants: 37.1%

A plan with a high ratio is more sensitive to fluctuations in salary (if a salary-based plan) and statutory changes. A plan with a low ratio is at higher risk from demographic experience. Such a plan should pay close attention to valuation assumptions as there will be less opportunity to realize future offsetting gains or losses when current experience deviates from assumptions. Plans with a low ratio also have limited opportunities to make alterations to plan design to affect future funded status.

Asset Leverage - Ratio of Payroll for Plan Participants to Market Value of Assets: 12.3%

Younger plans typically have a large payroll base from which to draw in order to fund the plan while mature plans often have a large pool of assets dedicated to providing benefits to a population primarily consisting of members no longer on payroll. Plans with low asset leverage will find it more difficult to address underfunding, as the contributions needed to make up the deficit will represent a higher percentage of payroll than for a plan with high asset leverage.

Benefit Payment Percentage - Ratio of Annual Benefit Payments to Market Value of Assets: 10.9%

As a plan enters its decumulation phase, a larger percentage of the pre-funded assets are paid out each year to retirees. A high percentage is not cause for alarm as long as the plan is nearly fully funded. However, such a plan is more sensitive to negative asset performance, especially if cash contributions are not an option to make up for losses.

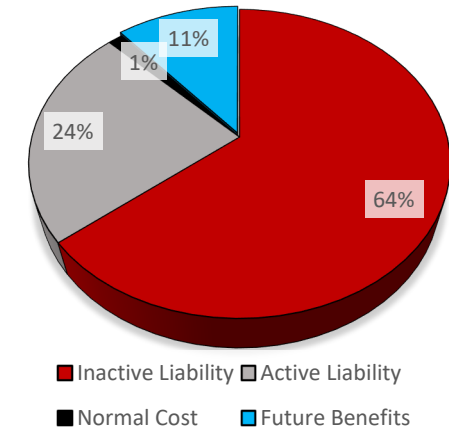
Assets and Liabilities

Present Value of Future Benefits

The Present Value of Future Benefits represents the discounted value of all future benefits expected to be payable to current members, considering future service and compensation not yet earned.

	June 30, 2019
Present Value of Future Benefits	
Active members	
Retirement	\$76,919,971
Disability	3,731,559
Death	1,296,250
Termination	1,708,075
Refund of Employee Contributions	678,974
Total active	<u>\$84,334,829</u>
Inactive members	
Retired and Disabled members	\$142,836,405
Beneficiaries	9,658,469
Terminated vested members	1,192,782
Total inactive	<u>\$153,687,656</u>
Total	\$238,022,485
Present Value of Future Payrolls	\$162,205,895
Present Value of Future Employee Contributions	\$14,890,807

Breakdown of Present Value of Future



Assets and Liabilities

Accrued Liability

The Accrued Liability measures the present value of benefits earned as of the valuation date, using a specified set of actuarial assumptions. It is not a long-term snapshot of the liabilities.

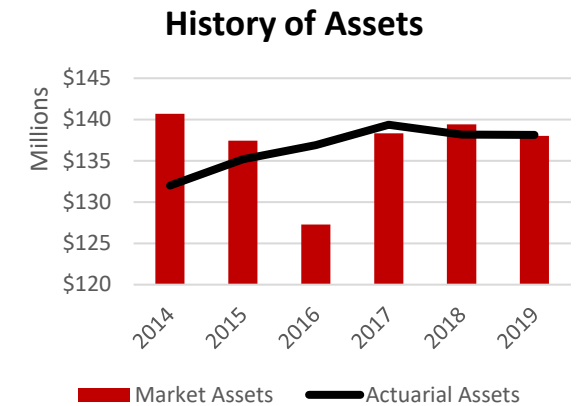
	June 30, 2019
Accrued Liabilities	
Active members	
Retirement	\$52,547,433
Disability	1,956,277
Death	729,896
Termination	(217,721)
Total Active	<u>\$55,015,885</u>
Inactive members	
Retired and Disabled members	\$142,836,405
Beneficiaries	9,658,469
Terminated vested members	1,192,782
Total Inactive	<u>\$153,687,656</u>
Total	\$208,703,541
Total Normal Cost	\$3,165,407

Assets and Liabilities

Asset Information

The amount of assets backing the pension promise is the most significant driver of volatility and future costs within a pension plan. The investment performance of the assets directly offsets the ultimate cost.

	Market Value June 30, 2019
Asset Value Reconciliation	
Value of assets, beginning of year	\$139,401,081
Contributions	
Employer	\$5,460,962
Employee	1,501,449
Total	\$6,962,411
Investment income, net expenses	\$6,872,166
Benefit payments and refunds	(15,029,671)
Administrative expenses	(198,143)
Value of assets, end of year	\$138,007,844
Return on Market Value ¹	5.1%
Actuarial Value of Plan Assets	\$138,141,096



¹Return based on mid-year cash flows

Assets and Liabilities

Asset Information (continued)

Plan Assets are used to develop funded percentages and contribution requirements.

	June 30, 2019
1. Actuarial value of assets, beginning of year	\$138,192,403
2. Market value of assets, beginning of year	\$139,401,081
3. Contributions	\$6,962,411
4. Admin Expenses	(198,143)
5. Benefit Payments and Refunds	(15,029,671)
6. Expected Total Investment Income	10,054,478
7. Market Value of Assets, end of year	138,007,844
8. Investment Income, net expenses	6,872,166
9. Amount of Phased-In Recognition (8-6)	(3,182,312)
10. Investment Gain/Loss	
a. From current year (9*.25)	(795,578)
b. From 1 year prior	161,377
c. From 2 years prior	1,929,895
d. From 3 years prior	(3,136,076)
e. Total	(1,840,382)
11. Preliminary Actuarial value of assets, end of year (1 + 3 + 4 + 5 +6 +10e)	\$138,141,096
12. 80% of Market value of assets	\$110,406,275
13. 120% of Market value of assets	\$165,609,413
14. Final Actuarial value of assets	\$138,141,096
15. Return on Actuarial Value	6.1%

Assets and Liabilities

Reconciliation of Gain/Loss

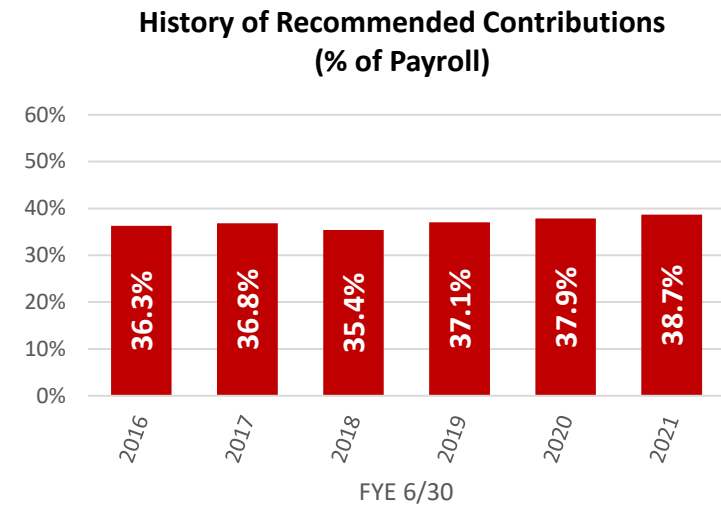
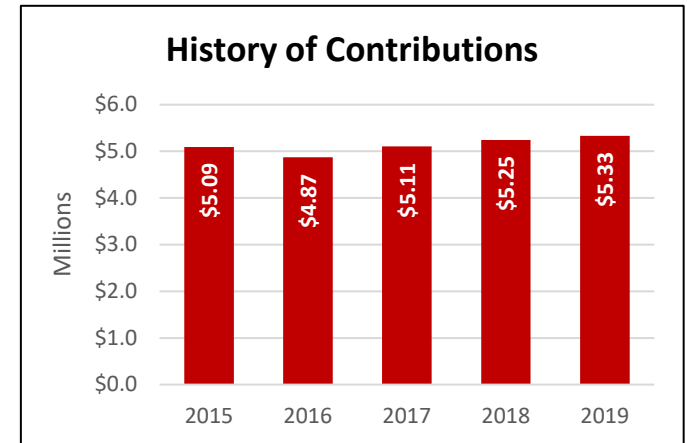
	June 30, 2019
Liability (gain)/loss	
Actuarial liability (06/30/2018)	\$190,828,284
Normal cost	3,243,615
Benefit payments	(15,029,671)
Actuarial Transition	6,369,769
Expected Interest	14,479,702
Assumption changes	8,852,310
Plan provision changes	0
Expected actuarial liability (06/30/2019)	\$208,744,009
Actual actuarial liability	\$208,703,541
Liability (gain)/loss	(\$40,468)
Asset (gain)/loss	
Actuarial value of assets (06/30/2018)	\$138,192,403
Contributions	6,962,411
Benefit payments and expenses	(15,227,814)
Expected Investment return	10,054,478
Change in actuarial value of assets method	0
Expected actuarial value of assets (06/30/2019)	\$139,981,478
Actual actuarial value of assets (06/30/2019)	\$138,141,096
Asset (gain)/loss	\$1,840,382
Total (gain)/loss	\$1,799,914

Contribution Requirements

Development of Recommended Contribution

The minimum recommended contribution is the annual amount necessary to fund the plan according to funding policies and/or applicable laws. The recommended contribution is composed of the normal cost, administrative expenses, plus an amortization charge.

	June 30, 2019
Funded Position	
1. Entry age accrued liability	\$208,703,541
2. Actuarial value of assets	138,141,096
3. Unfunded actuarial accrued liability (UAAL)	\$70,562,445
4. Expected Contribution Discounted to June 30, 2019	5,703,689
5. Unfunded actuarial accrued liability to amortize	\$64,858,756
Employer Contributions¹	
1. Normal Cost	
(a) Total normal cost	\$3,165,407
(b) Expected participant contributions	1,512,895
(c) Net normal cost	\$1,652,512
2. Administrative expenses	200,000
3. Amortization of UAAL	4,134,560
4. Interest	566,454
5. Total recommended contribution for 2020	\$6,553,526
6. Expected covered payroll	\$16,938,988
As a percentage of covered payroll	38.7%
7. Total Normal Cost as a Percentage of Covered Payroll	18.7%



¹Contribution by division is shown on page 37

Michigan PA 202 Reporting Requirements

Under Michigan PA 202 Reporting, the Funded Ratio and Actuarial Determined Contribution must also be reported under State Treasury Uniform Assumptions as shown.

	June 30, 2019	
	Plan Assumptions	State Treasury Uniform Assumptions
Funded Ratio		
<i>Interest Rate</i>	7.50%	7.00%
<i>Mortality</i>	<i>RP-2014 with Scale MP 2018</i>	<i>No change</i>
Accrued Liability	\$209,518,901	\$220,371,273
Market Value of Assets	\$138,007,844	\$138,007,844
Unfunded Accrued Liability, MVA Basis	\$71,511,017	\$82,363,429
Funded Percentage (MVA)	65.87%	62.63%
Actuarial Determined Contribution		
<i>Interest Rate</i>	7.50%	7.00%
<i>Mortality</i>	<i>RP-2000 Combined Healthy Mortality Table</i>	<i>RP-2014 with Scale MP 2018</i>
Actuarially Determined Contribution July 1, 2018 – June 30, 2019	\$5,332,723	
Actuarially Determined Contribution July 1, 2019 – June 30, 2020	\$5,913,711	\$7,810,105

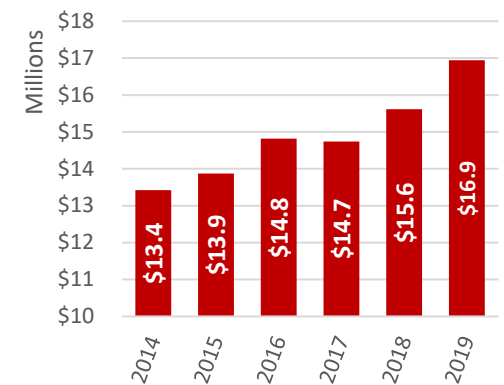
Demographic Information

Demographic Information

The foundation of a reliable actuarial report is the participant information provided by the plan sponsor. Monitoring trends in demographic information is crucial for long-term pension planning.

	June 30, 2018	June 30, 2019
Participant Counts		
Active Participants	226	228
Retired Participants	306	306
Disabled Participants	0	6
Beneficiaries	63	64
Terminated Vested Participants	8	11
Total Participants	603	615
Active Participant Demographics		
Average Age	44.9	44.5
Average Service	11.5	10.9
Average Compensation	\$69,088	\$74,294
Covered Payroll	\$15,613,937	\$16,938,988

History of Covered Payroll



Demographic Information

Demographic Information (continued)

	June 30, 2018	June 30, 2019
Retiree Statistics		
Count	306	306
Average Age	67.8	67.9
Average Monthly Benefit	\$3,464	\$3,514
Disabled Participant Statistics		
Count	0	6
Average Age	N/A	70.3
Average Monthly Benefit	N/A	\$1,453
Beneficiary Statistics		
Count	63	64
Average Age	75.8	75.9
Average Monthly Benefit	\$1,521	\$1,613
Terminated Vested Participant Statistics		
Count	8	11
Average Age	52.2	50.1
Average Monthly Benefit	\$1,472	\$1,197

Monitoring the average age of the population is important due to the relationship of actuarial cost to age. Generally speaking, an older population generates a higher actuarial cost.

Changes in the ratio of active to retired participants can be a significant driver of costs in a volatile asset market.

Participant Reconciliation

Participant Reconciliation

	Active	Terminated Vested	Retired	Disabled	Beneficiaries	Totals
Prior Year	226	8	306	0	63	603
Active						
To Terminated Vested	(3)	3				0
To Retired	(12)		12			0
To Lump Sum Cash-Out	(7)					(7)
Terminated Vested						
To Retired		(1)	1			0
Retired						
To Disabled			(6)*	6*		0
To Death			(7)			(7)
Survivor						
To Death					(5)	(5)
Additions	24	1**			6	31
Current Year	228	11	306	6	64	615

* Disabled participants were not recognized as a separate status in prior years

** Participant was hired and terminated in the same year, is still due a refund of contributions

Participant Reconciliation

Active Participant Schedule

Active participant information grouped based on age and service.

Age Group	Years of Service										Total	Average Pay ¹
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up		
Under 25	6	4									10	\$54,117
25 to 29	6	15	4								25	\$72,198
30 to 34	3	8	13	1							25	\$69,283
35 to 39	1	5	6	5	2						19	\$80,345
40 to 44	2	5	7	5	8						27	\$81,481
45 to 49		4	1	4	7	21	2				39	\$92,827
50 to 54	1	6	4	5	14	9	2				41	\$77,242
55 to 59	1	5	2	1	5	3	1				18	\$59,156
60 to 64		2	6	6	1	2		2			19	\$61,033
65 to 69	1		1			1					3	\$29,044
70 & up				2							2	\$17,755
Total	21	54	44	29	37	36	5	2	0	0	228	\$74,294

Plan Status	The plan provides ongoing benefit accruals and participation is open to new entrants
Accrual of Benefits	A participant shall accumulate a benefit payable at normal retirement date based upon compensation and credited service earned as of the date of determination.
Benefits	
Normal Retirement	
Eligibility	General and Supervisors: Any age with 30 or more years of credited service, age 55 with 20 or more years of credited service, or age 60 with 10 or more years of credited service. Police, Fire, and Command: Age 50 with 20 or more years of credited service or age 55 with 10 or more years of service. May retire prior to age 50 with 20 or more years of credited service with forfeiture of i) health insurance premiums prior to age 50 and ii) post-retirement escalation.
Benefit	The benefit amounts attributable to service retirements and the conditions under which such benefits may be paid are described <i>Plan Provision by Group</i> table. Benefit formula is the following: $FAC \times \text{Years of Credited Service} \times \text{Multiplier}$, with a maximum allowable benefit of $\text{Maximum Multiplier} \times FAC$
Deferred Retirement Option Program (DROP)	
Eligibility	Supervisors: Age 55 with 25 years of service or with 30 years of service regardless of age. Police: Age 50 with 25 years of service. Fire: Age 50 with 20 years of service. Command: Age 50 with 25 years of service. Not eligible if joined COAM union on or after 1/1/2017
Conditions	See the <i>Plan Provisions by Group</i> table for details Command: Contribute 9% of compensation, not eligible for annuity withdrawal Police and Fire: Contribute 10% of compensation, not eligible for annuity withdrawal

Deferred Retirement (Vested Benefit)

Eligibility	Termination of City employment with 10 or more years of credited service.
Benefit	General: Accrued regular retirement amount payable beginning at age 55 with 20 years of service or age 60 with 10 years of service Police and Fire: Accrued regular retirement amount payable beginning at age 50 with 20 years of service or age 55 with 10 years of service

Duty Disability Retirement

Eligibility	Total and permanent disability incurred in line of duty with the City for which Worker's Compensation is paid.
Benefit	General and Supervisors: Accrued regular retirement amount; minimum to age 55, 15% of FAC; minimum at age 55, sum of 10% of first \$4,200 of FAC, plus 15% of FAC in excess of \$4,200. Police, Fire, and Command: Minimum to age 50, 15% of FAC. Not eligible for annuity withdrawal. For all members, upon termination of Worker's Compensation period, or attainment of age 65, if earlier, service credit increased to include years in receipt of Worker's Compensation. Minimum - 50% of FAC.

Non-Duty Disability

Eligibility	Total and permanent disability after 10 years of credited service.
Benefit	General and Supervisors: Accrued regular retirement amount, minimum 15% of FAC. Police, Fire, and Command: Accrued regular retirement amount. Not eligible for annuity withdrawal.

Duty Death in Service

Eligibility	Death incurred in line of duty with the City, or death of disability retiree as a result of same injury or disease for which he was retired; Worker's Compensation is being paid as a result of the death.
Benefit	Termination of Worker's Compensation period, an amount equal to Worker's Compensation payments are continued to unmarried spouse, unmarried children under age 18, and parents who were in receipt of Worker's Compensation as a result of the death. Command and Police members, benefit is continued until remarried or death. Minimum amount to spouse of a deceased Police or Fire member may continue after age 18 if Board finds child to be incapable of self-support due to a disability which began prior to attainment of age 18. Accumulated contributions are refunded.

Non-Duty Death in Service

Eligibility	Any age with 10 or more years of credited service.
Benefit	100% survivor actuarial equivalent of accrued regular retirement amount to elected beneficiary

Post-Retirement Increase

Eligibility	Command, Police, and Fire members with effective dates of retirement on or after July 1, 1977 and July 1, 1976, respectively. If began normal retirement prior to age 50, forfeit post-retirement cost-of-living adjustments. General members with effective dates of retirement on or after January 1, 1993.
Benefit	See <i>Plan Provisions by Group</i> for details

Annuity Withdrawal

Eligibility	Command, Police (except POAM hired after July 1, 2012) and Fire members
Benefit	A police or fire member retiring with a normal retirement allowance may elect to withdraw all or part of their member contributions. The member's pension shall be reduced by the actuarial equivalent of the amount withdrawn. If a member elects the Annuity Withdrawal Option, the member shall only receive a distribution of ninety-five percent (95%) of the amount elected to be withdrawn, and the remaining five percent (5%) shall be credited to the Retirement System. The additional two percent (2%) employee contribution agreed to by the Command Officers and Patrolman contracts and interest earned on those contributions shall not be available for the Annuity Withdrawal Option and any contribution (and interest) to the City's retirement system by a Command, Patrolman or Fire member participating in the City's Deferred Retirement Option Plan ("DROP") shall not be subject to the Annuity Withdrawal Option. Effective July 1, 2016, the extra 2% contribution and interest earned can now be withdrawn upon retirement for Command Officers. The additional 2% contribution paid prior to July 1, 2016 along with interest cannot be withdrawn.

Plan Provisions

Final Average Compensation See the *Plan Provisions by Group* table for details.

Employee Contributions See the *Plan Provision by Group* table for details.

Plan Provisions Not Included We are not aware of any plan provisions not included in the valuation

Adjustments Made for Subsequent Events

We are not aware of any event following the measurement date and prior to the date of this report that would materially impact the results of this report

Plan Provision by Group

EMPLOYEES HIRED PRIOR TO JULY 1, 2012

UNION	RETIREMENT ELIGIBILITY Service/Age	FINAL AVERAGE COMP	BENEFIT MULTIPLIER Service earned prior to 6/30/2012	BENEFIT MULTIPLIER Service earned after 6/30/2012	MAXIMUM MULTIPLIER Hired Prior to 7/1/1994 vs Hired After 7/1/1994	COLA Retired Prior to 7/1/2012 (5/20/2013 for Command)	COLA Retired After 7/1/2012 (5/20/2013 for Command)	MEMBER CONTR RATE	DROP PARTICIPATION	DROP TERMS
CLERICAL	10 / 60; 20 / 55; or 30 / any age	5 highest consecutive years out of last 10	2.50%	2.00%	80% 75%	10% increase years 5 and 10	5% increase years 5, 10, and 15	8.25%	25 Years and age 50 / 30 years and any age	2 Years Max
COURT	10 / 60; 20 / 55; or 30 / any age	Any 3 years out of last 5 years	2.50%	2.00%	80% 75%	10% increase years 5 and 10	5% increase years 5 and 10	9%	N/A	N/A
LOCAL 520	10 / 60; 20 / 55; or 30 / any age	Any 3 years out of last 5 years	2.80%	2.00%	80% 75% Eff 1/1/1995	10% increase years 5 and 10	5% increase years 5, 10, and 15	6.5%	N/A	N/A
SUPERVISORS	10 / 60; 20 / 55; or 30 / any age	Any 3 years out of last 5 years*	2.50%	2.00%	80% 75%	10% increase years 5 and 10	5% increase years 5, 10, and 15	6.5%	25 Years and age 55 / 30 years and any age	4.5 Years Max
COMMAND OFFICERS	10 / 55; 20 / 50; or 20 / any age but forfeitures apply	Any 3 years out of last 10 years*	2.8% to 25 yrs; 1.5% to 29 yrs		75%	15% increase years 5 and 10	15% increase year 5	9%	25 Years and age 50. Not eligible if joined COAM union on or after 1/1/2017	7 Years Max
POLICE PATROL OFFICERS	10 / 55; 20 / 50; or 20 / any age but forfeitures apply	Any 3 years out of last 10 years*	2.8% to 25 yrs; 1.5% to 29 yrs		75%	15% increase years 5 and 10	15% increase year 5	9%	25 Years and age 50	2 Years Max
FIREFIGHTERS	10 / 55; 20 / 50; or 20 / any age but forfeitures apply	Any 3 years out of last 10 years*	2.8% thru 10/31/2013 up to 25 years 2.5% effective 11/1/2013 with no service cap		75%	15% increase years 5 and 10	15% increase year 5	10%	20 Years and age 50	3 Years Max

**Year is any 4 consecutive quarters

Plan Provision by Group

EMPLOYEES HIRED ON OR AFTER JULY 1, 2012 (January 1, 2011 FOR FIREFIGHTERS)

UNION	RETIREMENT ELIGIBILITY Service/Age	FINAL AVERAGE COMP	BENEFIT MULTIPLIER	MAXIMUM MULTIPLIER	COLA	MEMBER CONTR RATE	DROP PARTICIPATION	DROP TERMS
CLERICAL	10 / 60; 20 / 55; or 30 / any age	5 highest consecutive years out of last 10	1.50%	75%	5% increase years 5, 10, and 15	9.5%	25 Years and age 50 / 30 years and any age	2 Years Max
COURT	10 / 60; 20 / 55; or 30 / any age	Any 3 years out of last 5 years	1.50%	70%	5% increase years 5 and 10	9%	N/A	N/A
LOCAL 520	10 / 60; 20 / 55; or 30 / any age	Any 3 years out of last 5 years	1.50%	75%	5% increase years 5, 10, and 15	8%	N/A	N/A
SUPERVISORS	10 / 60; 20 / 55; or 30 / any age	Any 3 years out of last 5 years (Year is any 4 consecutive quarters)	1.50%	75%	5% increase years 5, 10, and 15	10.5% until 6/30/2019	25 Years and age 55 / 30 years and any age	4.5 Years Max
COMMAND OFFICERS	10 / 55; 20 / 50; or 20 / any age but forfeitures apply	Any 3 years out of last 10 years (Year is any 4 consecutive quarters)	2.8% to 25 yrs; 1.5% to 29 yrs	75%	15% increase year 5	9%	25 Years and age 50. Not eligible if joined COAM union on or after 1/1/2017	7 Years Max
POLICE PATROL OFFICERS	10 / 55; 20 / 50; or 20 / any age but forfeitures apply	Any 3 years out of last 10 years (Year is any 4 consecutive quarters)	2.50%	70%	N/A	10%	N/A	N/A
FIREFIGHTERS	10 / 55; 20 / 50; or 20 / any age but forfeitures apply	Any 3 years out of last 10 years (Year is any 4 consecutive quarters)	2.50%	70%	10% increase in year 5; 5% increase in year 10	10%	20 Years and age 50	3 Years Max

Actuarial Assumptions

Except where otherwise indicated, the following assumptions were selected by the plan sponsor with the concurrence of the prior actuary.

Actuarial Assumptions, Methods and Additional Information for Funding

Valuation Date	June 30, 2019
Participant Information as of	June 30, 2019
Asset Information as of	June 30, 2019
Cost Method	Entry Age Normal Cost Method
Amortization Method	Level percent of payroll
Remaining Amortization Period	25
Payroll Growth Assumptions	3.0%
Asset Valuation Method	4-year adjusted market value
Interest Rates	7.5% (net of investment expenses)
Investment Rate of Return	The interest rate is the long term rate of return on assets. This assumption is supported by the investment mix of the plan assets and long-term capital market return assumptions.
Expense Loading	None assumed
Marital Status and Ages	No assumptions
Lump Sum Payments	Lump Sum Payments included in the calculation of average pay upon which benefits are computed were assumed to increase benefits by 10%. Using non-consecutive quarters in FAC was assumed to increase benefits by 1%.

Actuarial Assumptions

Annual Pay Increases

If the number of active members remains constant, then the total active member payroll will increase 5.00% annually, the base portion of the individual salary increase assumptions. **The rates of salary increase** used for individual members are in accordance with the following table:

Annual Rate of Pay Increases of Sample Ages

Sample Ages	Base (Economic)	Merit and Longevity		Totals	
		All General	Police-Fire	All General	Police-Fire
20	5.0%	3.8%	3.0%	8.8%	8.0%
25	5.0%	3.1%	3.0%	8.1%	8.0%
30	5.0%	2.7%	2.6%	7.7%	7.6%
35	5.0%	2.4%	1.1%	7.4%	6.1%
40	5.0%	2.1%	0.2%	7.1%	5.2%
45	5.0%	1.7%	0.2%	6.7%	5.2%
50	5.0%	1.1%	0.2%	6.1%	5.2%
55	5.0%	0.7%	0.1%	5.7%	5.1%
60	5.0%	0.2%	-	5.2%	5.0%
65	5.0%	-	-	5.0%	5.0%

Mortality Rates

Healthy

RP-2006 Total Mortality Table projected generationally with scale MP-2019

Disabled

RP-2006 Disabled Mortality Table projected generationally with scale MP-2019

Actuarial Assumptions

Retirement Rates

Retirement rates are based on the last experience study conducted by the prior actuary. Retirement rates are separated by age of participant, as shown below.

Active Members Retiring Within Year Following Attainment of Indicated Retirement Age

Age Retiring	Supervisors	General	Police	Fire
50	30%	20%	50%	50%
51	25%	15%	25%	35%
52	20%	10%	25%	25%
53	20%	10%	25%	25%
54	20%	10%	25%	25%
55	20%	10%	25%	25%
56	20%	10%	25%	25%
57	20%	10%	25%	25%
58	20%	10%	25%	25%
59	20%	10%	25%	25%
60	20%	10%	100%	100%
61	20%	10%		
62	40%	30%		
63	20%	10%		
64	20%	10%		
65	100%	100%		

Disability Rates

Disability rates vary by age, gender, and division. This assumption measures the probability of members retiring with a disability benefit.

Percent Becoming Disabled Within Next Year

Sample Ages	General		Police/Fire
	Men	Women	
20	0.07%	0.03%	0.10%
25	0.09%	0.05%	0.15%
30	0.10%	0.07%	0.20%
35	0.14%	0.13%	0.25%
40	0.21%	0.19%	0.50%
45	0.32%	0.28%	0.65%
50	0.52%	0.45%	0.80%
55	0.92%	0.76%	0.95%

Actuarial Assumptions

Withdrawal Rates

Withdrawal rates vary by service for first 5 years of employment, and vary by age after 5 years.

Sample Ages	Years Of Service	% of Active Members Withdrawing Within Next Year		
		General Members	Police	Fire
ALL	0	20.00%	12.00%	10.00%
	1	15.00%	9.00%	7.00%
	2	10.00%	7.00%	5.00%
	3	8.00%	5.00%	4.00%
	4	7.00%	4.50%	3.50%
20	5 & Over	6.00%	4.50%	3.50%
25		6.00%	4.50%	3.50%
30		5.50%	3.90%	2.90%
35		4.40%	2.30%	1.50%
40		1.85%	0.90%	0.60%
45		1.25%	0.50%	0.50%
50		1.25%	0.50%	0.50%
55		1.25%	0.50%	0.50%
60		1.25%	0.50%	0.50%
65		1.25%	-	-

Changes Since Prior Report

The mortality assumption was changed to RP-2006 Mortality with Scale MP-2019

The RP-2006 Disabled Mortality Table with scale MP-2019 was added to value disabled participants.

The amortization period for the development of the recommended contribution was increased from 15 years to 25 years

The payroll growth assumption for the development of the recommended contribution was lowered from 5.00% to 3.00%

Other Measurements

The actuarial report also shows the necessary items required for plan reporting by division.

- ✓ Actuarial Liabilities and Normal Cost by Division
- ✓ Unfunded Actuarial Accrued Liability by Division
- ✓ Reconciliation of Gain/Loss by Division
- ✓ Development of Recommended Contribution by Division
- ✓ Demographic Information by Division
- ✓ Active Participant Schedules by Division

Actuarial Liabilities and Normal Cost by Division

	General	Police & Fire	Total
Present Value of Future Benefits	\$85,230,854	\$152,791,631	\$238,022,485
Actuarial Accrued Liability			
Active Members	\$15,858,394	\$39,157,491	\$55,015,885
Terminated Vested	837,458	355,324	1,192,782
Retired and Disabled	56,251,580	86,584,825	142,836,405
Beneficiaries	3,069,744	6,588,725	9,658,469
Total Actuarial Accrued Liability	\$76,017,176	\$132,686,365	\$208,703,541
Total Normal Cost	\$1,035,593	\$2,129,814	\$3,165,407

Unfunded Actuarial Accrued Liability by Division

	General	Police & Fire	Total
Actuarial Accrued Liability	\$76,017,176	\$132,686,365	\$208,703,541
Actuarial Value of Assets	<u>50,316,513</u>	<u>87,824,583</u>	<u>138,141,096</u>
Unfunded Actuarial Accrued Liabilities	\$25,700,663	\$44,861,782	\$70,562,445
Funded Ratio	66.2%	66.2%	66.2%

Reconciliation of Gain/Loss by Division

	General	Police & Fire	Total
Liability (gain)/loss			
Actuarial liability, 6/30/2018	\$68,889,187	\$121,939,097	\$190,828,284
Normal cost	1,056,847	2,186,768	3,243,615
Benefit payments (Estimated Split)	(6,011,867)	(9,017,803)	(15,029,671)
Actuarial Transition	3,546,061	2,823,708	6,369,769
Expected Interest	5,290,538	9,189,164	14,479,702
Assumption Changes	3,856,131	4,996,179	8,852,310
Plan Provision Changes	<u>0</u>	<u>0</u>	<u>0</u>
Expected actuarial liability, 6/30/2019	\$76,626,896	\$132,117,113	\$208,744,009
Actual actuarial liability, 6/30/2019	<u>\$76,017,176</u>	<u>\$132,686,365</u>	<u>\$208,703,541</u>
Liability (gain)/loss	\$(609,720)	\$569,252	(\$40,468)

Development of Recommended Contribution by Division

	General	Police & Fire	Total
Expected 2020 Payroll	\$6,766,236	\$10,172,752	\$16,938,988
Normal Cost			
(a) Total normal cost	\$1,035,593	\$2,129,814	\$3,165,407
(b) Expected member	<u>(553,448)</u>	<u>(959,447)</u>	<u>(1,512,895)</u>
(c) Net normal cost	\$482,145	\$1,170,367	\$1,652,512
Administrative Expenses	80,000	120,000	200,000
Amortization of UAAL	1,502,559	2,632,001	4,134,560
Interest	<u>195,347</u>	<u>371,107</u>	<u>566,454</u>
Total Employer Recommended Contribution FY 2020	\$2,260,051	\$4,293,475	\$6,553,526
<i>As a percentage of Payroll</i>	33.4%	42.2%	38.7%
Total Normal Cost as a % of Payroll	15.3%	20.9%	18.7%

Supplemental Information for Housing Employees as of June 30, 2019

Participant Counts

Active Participants	6
Inactive Participants	0

Liability Summary

Present Value of Future Benefits	1,422,199
Actuarial Accrued Liability	934,649
Total Normal Cost	45,231
Expected Employee Contributions	<u>(22,134)</u>
Net Normal Cost	23,097

Demographic Information by Division

	General	Police & Fire	Total
Active Participants			
Number accruing benefits	119	109	228
Average age	48.8	39.8	44.5
Average years of employment	10.0	12.0	10.9
Average pay	\$56,859	\$93,328	\$74,294
Terminated Vested			
Number of Terminated Vested	8	3	11
Average age	49.8	50.9	50.1
Total deferred annual benefits	\$105,614	\$52,435	\$158,049
Average deferred monthly annual benefit	\$1,100	\$1,457	\$1,197
Participants Receiving Benefits			
Number Receiving Benefits	203	173	376
Average age	71.0	67.4	69.3
Total annual benefits	\$5,872,401	\$8,374,608	\$14,274,009
Average monthly benefit	\$2,411	\$4,034	\$3,158

Active Participant Schedules by Division

Active participant information grouped based on age and service.

General

Age Group	Years of Service										Total	Average Pay
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up		
Under 25	4	1									5	\$42,519
25 to 29	3	3									6	\$56,056
30 to 34	2	3	3								8	\$39,269
35 to 39	1	5			1						7	\$60,639
40 to 44	2	4	6	1							13	\$66,013
45 to 49		3		1	2	5	1				12	\$61,742
50 to 54	1	6	4	5	9	5					30	\$64,848
55 to 59	1	5	1	1	5	2	1				16	\$53,626
60 to 64		2	6	5	1	1		2			17	\$56,091
65 to 69	1		1			1					3	\$29,044
70 & up				2							2	\$17,755
Total	15	32	21	15	18	14	2	2	0	0	119	\$56,859

Active Participant Schedules by Division

Active participant information grouped based on age and service.

Police & Fire

Age Group	Years of Service										Total	Average Pay
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & Up		
Under 25	2	3									5	\$65,715
25 to 29	3	12	4								19	\$77,296
30 to 34	1	5	10	1							17	\$83,407
35 to 39			6	5	1						12	\$91,840
40 to 44		1	1	4	8						14	\$95,844
45 to 49		1	1	3	5	16					27	\$106,643
50 to 54					5	4	1				11	\$111,046
55 to 59			1			1	2				2	\$103,398
60 to 64				1		1					2	\$103,039
65 to 69												
70 & up												
Total	6	22	23	14	19	22	3	0	0	0	109	\$93,328