City of Royal Oak
Retiree Health Care Plan

The Report of the Actuarial Valuation as of June 30, 2018

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November 27, 2018

Ms. Julie Rudd
Finance Director
City of Royal Oak
211 S. Williams Street
Royal Oak, Michigan 48067

Dear Ms. Rudd:

Submitted in this report are the results of an Actuarial Valuation of the assets and benefit values associated with the employer financed retiree health benefits provided by the City of Royal Oak. The date of the valuation was June 30, 2018.

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

The actuarial calculations were prepared for purposes of measuring the Plan's funding progress and to determine the Actuarially Computed Employer Contributions rates for the fiscal years ending June 30, 2020 and June 30, 2021. This report should not be relied on for any purpose other than the purposes described herein. Determinations of the liability associated with the benefits described in this report for purposes other than satisfying those identified above may be significantly different. This report does not satisfy Governmental Accounting Standards Board (GASB) Statement Nos. 74 or No. 75.

The computed contributions shown on page A-1 may be considered as minimum contributions. 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 plan, we suggest that contributions to the Plan in excess of those presented in this report be considered.

This report 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 the assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the Plan's financial condition.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

Mark Buis and James D. Anderson are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the Plan 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.

Please see the following page for additional disclosures required by the Actuarial Standards of Practice.

Respectfully submitted,

Mark Buis

Mark Buis, FSA, EA, FCA, MAAA

James D. Anderson

James D. Anderson, FSA, EA, FCA, MAAA

MB/JDA:sc

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Additional Disclosures Required by Actuarial Standards of Practice

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 or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

The funded ratio reported in this valuation is not appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.

This report should not be relied on for any purpose other than the purpose described in the primary communication.

The signing actuaries are independent of the plan sponsor.

EXECUTIVE SUMMARY

Executive Summary

Actuarially Computed Employer Contribution

Please note that beginning with the fiscal year ending June 30, 2017, GASB Statement No. 43 was replaced by GASB Statement No. 74. Also, beginning with the fiscal year ending June 30, 2018, GASB Statement No. 45 was replaced by GASB Statement No. 75. Separate GASB reports will be required to comply with the actuarial requirements of GASB Statements No. 74 and No. 75 for the fiscal year ending June 30, 2018. As such, there will no longer be an "Annual Required Contribution" calculated in the valuation report. Therefore, we have determined the "Actuarially Computed Employer Contribution".

We have calculated the Actuarially Computed Employer Contribution for the fiscal years ending June 30, 2020 and June 30, 2021 under the interest rate assumption of 7.25%. Below is a summary of the results.

For additional details please refer to Section A, "Valuation Results".

	Actuarially Computed Employer Contribution*	Estimated Claims Paid for Retirees
Fiscal Year Ending June 30, 2020	$ 1,021,651	$ 8,138,896
Fiscal Year Ending June 30, 2021	940,979	8,831,338

** Based on a 7.25% long-term rate of investment return.*

Liabilities and Assets – As of June 30, 2018

1. Present Value of Future Benefit Payments	$141,563,941
2. Actuarial Accrued Liability	136,370,998
3. Plan Assets	134,564,918
4. Unfunded Actuarial Accrued Liability (3) – (2)	1,806,080
5. Funded Ratio (3)/(2)	98.7%

The Present Value of Future Benefit Payments (PVFB) is the present value of all benefits projected to be paid from the plan for past and future service. The Actuarial Accrued Liability is the portion of the PVFB allocated to past service by the Plan's funding method (see the Section titled "Actuarial Cost Method and Actuarial Assumptions").

SECTION A

VALUATION RESULTS

Development of the Actuarially Computed Employer Contribution for the Other Postemployment Benefits Fiscal Years Ending June 30, 2020 and June 30, 2021

Contributions for	Development of the Actuarially Computed Employer Contribution for July 1, 2019 - June 30, 2020		
	General	Police & Fire	Total
Normal Cost			
Normal Retirement	$ 376,398	$ 447,936	$ 824,334
Early Retirement	0	0	0
Termination Benefits	0	6,694	6,694
Death-in-Service	4,777	3,905	8,682
Disability	0	13,946	13,946
Future Refund of Member Contributions	0	0	0
Total Normal Cost	$ 381,175	$ 472,481	$ 853,656
Annual Active Member Contribution	0	0	0
Employer Normal Cost	381,175	472,481	853,656
Amortization of Unfunded Actuarial Accrued Liabilities	69,259	98,736	167,995
Actuarially Computed Employer Contribution	450,434	571,217	1,021,651

Contributions for	Actuarially Computed Employer Contribution for July 1, 2020 - June 30, 2021		
	General	Police & Fire	Total
Actuarially Computed Employer Contribution	$ 412,218	$ 528,761	$ 940,979

The unfunded actuarial accrued liabilities were amortized as a level dollar amount over a period of 20 years for the fiscal year ending June 30, 2020 and decreasing by one each year thereafter.

The long-term rate of investment return used in this valuation was 7.25%.

Determination of Unfunded Actuarial Accrued Liability as of June 30, 2018

	General	Police & Fire	Total
A. Present Value of Future Benefits			
1. Retirees and Beneficiaries	$40,416,741	$63,617,009	$ 104,033,750
2. Vested Terminated Members	187,421	369,409	556,830
3. Active Members	17,847,687	19,125,674	36,973,361
Total Present Value of Future Benefits	$58,451,849	$83,112,092	$141,563,941
B. Present Value of Future Employer Normal Costs	2,285,403	2,907,540	5,192,943
C. Present Value of Future Contributions from Current Active Members	0	0	0
D. Actuarial Accrued Liability (A.-B.-C.)	56,166,446	80,204,552	136,370,998
E. Actuarial Value of Assets	55,422,585	79,142,333	134,564,918
F. Unfunded Actuarial Accrued Liability (D.-E.)	743,861	1,062,219	1,806,080

The long-term rate of investment return used in this valuation is 7.25%.

Development of Valuation Assets

Year Ended June 30:	2018	2019	2020	2021	2022
A. Valuation Assets Beginning of Year	$ 132,323,704				
B. Market Value End of Year	132,477,912				
C. Market Value Beginning of Year	132,323,704				
D. Non-Investment Net Cash Flow	(7,212,633)				
E. Investment Income					
E1. Market Total: B - C - D	7,366,841				
E2. Amount for Immediate Recognition (7.75%)	9,975,598				
E3. Amount for Phased-In Recognition: E1-E2	(2,608,757)				
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.2 x E3	(521,751)				
F2. First Prior Year	0	$ (521,751)			
F3. Second Prior Year	0	0	$ (521,751)		
F4. Third Prior Year	0			$ (521,751)	
F5. Fourth Prior Year	0	0	0		$ (521,753)
F6. Total Phased-In Recognition	(521,751)	(521,751)	(521,751)	(521,751)	(521,753)
G. Valuation Assets End of Year: A + D + E2 + F6	134,564,918				
H. Difference between Market & Valuation Assets: B - G	(2,087,006)	(1,565,255)	(1,043,504)	(521,753)	0
I. Valuation Asset Recognized Rate of Return	7.34%				
J. Market Value Recognized Rate of Return	5.72%				

** In the year of implementation, the Valuation Assets Beginning of Year was set equal to the Market Value at the Beginning of Year.*

The Valuation 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, Valuation Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Valuation Assets will tend to be greater than Market Value. The Valuation Assets are unbiased with respect to Market Value. At any time, it may be either greater or less than Market Value. If assumed rates are exactly realized for 4 consecutive years, it will become equal to Market Value.

Comments

Comment A: One of the key assumptions used in any valuation of the cost of postemployment benefits is the rate of return on Plan assets. Higher assumed investment returns will result in a lower Actuarially Computed Employer Contribution. Lower returns will tend to increase the computed Actuarially Computed Employer Contribution. Based on information from the plan sponsor, we have calculated the liability and the resulting Actuarially Computed Employer Contribution using an assumed long-term rate of investment return of 7.25% similar to the Retirement System.

Comment B: The plan sponsor is required by GASB to perform actuarial valuations at least biennially or more frequently if significant changes in the OPEB are made in the interim.

Comment C: The Actuarially Computed Employer Contribution increased from $389,082 in the June 30, 2016 valuation to $1,021,651 in the June 30, 2018 valuation. Factors contributing to this increase include, but are not limited to:

- Decreasing the long-term rate of investment return assumption from 7.75% to 7.25%;
- Updating the mortality tables and other demographic assumptions (for more information, see the Experience Study report dated September 28, 2018);
- Higher medical rates than projected; and
- Resetting the health care trend rates.

Partially offsetting these factors were decreases due to:

- Changing the election percentage assumption; and
- Implementation of asset smoothing to help mitigate the impact of market volatility.

Comment D: The updates to actuarial assumptions for General groups increased actuarial accrued liabilities by approximately $4,815,000. The updates to actuarial assumptions for Police and Fire members increased actuarial accrued liabilities by approximately $6,959,000. In total, changes to actuarial assumptions increased actuarial accrued liabilities by approximately $11,774,000.

Comment E: The period of years used to amortize (pay off) the unfunded accrued liability is 20 years beginning with the fiscal year ending June 30, 2020. The amortization period is closed. This means that the amortization period will decrease by one year each year until the unfunded (or overfunded) liability is paid off.

Changing the amortization period does not change the ultimate cost of benefits. The cost of the benefits is based upon the benefits provided, the way they are used by retired members, and future health inflation.

Comments (Continued)

Comment F: The "Cadillac" tax is a 40% excise tax paid by the coverage provider (employer and/or insurer) on the value of health plan costs in excess of certain thresholds, effective in 2022. The initial thresholds are $10,200 for single coverage or $27,500 for family coverage. Many plans are below the thresholds today, but are likely to exceed them in the next decade. The thresholds will be indexed at CPI-U, which is lower than the medical inflation rates affecting the cost of the plans. There is considerable uncertainty about how the tax would be applied, and considerable latitude in grouping of participants for tax purposes. Combining early retiree and Medicare eligible retiree costs is allowed and can keep plans under the thresholds for a longer period of time. For this valuation, there was no load applied to the health care liabilities to approximate the cost for future excise tax, based on the current plan provisions and assumptions. We have not identified any other specific provision of health care reform that would be expected to have a significant impact on the measured obligation. As additional guidance on the legislation is issued, we will review and monitor the impact.

Comment G: The GASB issued Statement Nos. 74 and 75 for OPEB valuations similar to the new pension standards. GASB Statement No. 74 for the plan OPEB disclosures is effective for fiscal years beginning after June 15, 2016. GASB Statement No. 75 for employer OPEB disclosures is effective for employer fiscal years beginning after June 15, 2017. The GASB implementation guides for Statement Nos. 74 and 75 provide additional clarification related to the implementation of these Statements. It is our understanding that the City of Royal Oak will need to comply with GASB Statement No. 75 beginning with the fiscal year ending June 30, 2018. The information necessary for GASB Statement Nos. 74 and 75 was published in an earlier report.

Comment H: Michigan Public Act 202 of 2017 created new reporting and other requirements for local units of government. The assumptions and/or methods used in this valuation **do not** fall in the range of uniform assumptions established by the Treasurer for PA 202 reporting purposes. The information necessary for PA 202 reporting purposes will need to be developed at a later date.

SECTION B

RETIREE PREMIUM RATE DEVELOPMENT

Retiree Premium Rate Development

The City offers benefits on a fully-insured basis and on a self-insured basis. The fully-insured and self-insured rates are developed separately and then blended together at the end to create a single set of rates for use in the valuation.

Initial self-inured premium rates were developed separately for each class (Medicare (post-65) and Non-Medicare (pre-65) retirees). The rates were calculated by using incurred claims and exposure data during the period of April 2015 to March 2018 and paid through June 2018 adjusted for catastrophic claims, plus the load for administration, network access fee, and stop loss premiums. The Medical data was analyzed for the pre-65 and post-65 participants separately since Medicare is available for the post-65 participants and has a significant impact on the claim experience. We estimated the split between Medicare and Non-Medicare claims since they were not provided separately. Furthermore, since the prescription drug claims and the medical claims exhibit different trends and claim payment patterns, we analyzed these claims separately as well.

Initial fully-insured premium rates were developed for the two classes of retirees (pre-65 and post-65). The fully-insured rates provided by the City were utilized to determine the appropriate premium rates. For the pre-65 and post-65 retirees, the fully-insured premium rate is used as the basis of the initial per capita cost without adjustments since the rates reflect the demographics of each of the retiree groups.

All Medicare retirees in BCBS plans are enrolled in the Medicare Advantage for medical coverage. For their Rx coverage, they get the prescription drug benefit that corresponds to their BCBS suffix.

For the current active employees it was assumed they would retire into a Blue Cross/Blue Shield Plan. We have developed separate premium rates for future retirees in order to reflect the benefit differences.

Age graded and sex distinct premiums are utilized by this valuation. The premiums developed by the preceding process are appropriate for the unique age and sex distribution currently existing. Over the future years covered by this valuation, the age and sex distribution will most likely change. Therefore, our process “distributes” the average premium over all age/sex combinations and assigns a unique premium for each combination. The age/sex specific premiums more accurately reflect the health care utilization and cost at that age.

Retiree Premium Rate Development (Concluded)

The combined monthly one-person medical and drug premiums at select ages are shown below.

For Those Not Eligible for Medicare (Pre-65)				
	Future Retirees		Current Retirees	
Age	Male	Female	Male	Female
40	$ 344.54	$ 559.85	$ 417.93	$ 679.10
50	558.49	688.01	677.45	834.56
60	949.18	934.61	1,151.36	1,133.70
64	1,154.22	1,089.28	1,400.09	1,321.30

For Those Eligible for Medicare (Post-65)				
	Future Retirees		Current Retirees	
Age	Male	Female	Male	Female
65	$ 519.79	$ 490.26	$ 639.97	$ 603.62
75	608.15	593.42	748.76	730.62
85	643.08	650.66	791.77	801.09

The dental and vision premiums were not "age graded" for this valuation since these claims do not vary significantly by age. The combined dental and vision rates used in this valuation are $38.96 for pre-65 participants and $38.52 for post-65 participants.

James E. Pranschke is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to certify the per capita retiree health care rates shown above.

James E. Pranschke

James E. Pranschke, FSA, MAAA

SECTION C

SUMMARY OF BENEFIT PROVISIONS

City of Royal Oak Retiree Health Care Plan
Summary of Benefits as of June 30, 2018

Persons Covered

Health insurance coverage is provided by and paid for by the City for the following people:

- to retired members of the Retirement System if they meet the eligibility requirements for post-retirement medical benefits (see next page);

- to eligible spouses and/or dependents of eligible retirees during the retirees' lifetime;

- to eligible surviving spouses and/or dependents after the eligible retiree's death for members who retired on or after June 1, 1980. Spousal coverage does not continue for those who retired prior to June 1, 1980;

- to employees and eligible spouses and/or dependents who retire from a deferred status if they meet the minimum service requirements under their contract; and

- eligible employees may elect to receive health insurance through their spouse's health care plan. The City will pay the employee 30% of the schedule applicable premium annually, up to a maximum of $2,400.

  Note: Eligible = covered spouse and/or dependents at time of retirement or termination if deferred.

Benefits Provided

Retirees and their spouses are provided medical, prescription drug, dental, and vision coverage as well as reimbursed their Medicare Part B premiums. Benefits are provided as outlined in the labor contract/agreement under which the employee retired. (Some older contracts do not provide prescription drug, dental, and/or vision coverage.)

City of Royal Oak Retiree Health Care Plan
Summary of Benefits as of June 30, 2018

Eligibility Requirements

Current active members are eligible to receive City paid health insurance upon retirement if they meet the eligibility requirements below:

Employee Group	Date of Closure to New Hires	Eligibility Requirements
SEIU AFL-CIO Local 517 M	7/1/2006	Age 55 with 20 years of service or Age 50 with 25 years of service
Foreman & Supervisors	7/1/2006	Age 55 with 20 years of service or Age 50 with 25 years of service
Department Heads and Deputies	7/1/2008	Age 55 with 20 years of service, Age 50 with 25 years of service, or Age 60 with 15 years of service
Executive Department Heads/Judges	5/1/2008	Age 55 with 20 years of service, Age 50 with 25 years of service, or Age 60 with 15 years of service
Professional & Technical/44th District Court	7/1/2007	Age 55 with 20 years of service, Age 50 with 25 years of service, or Age 60 with 15 years of service
AFSCME/TPOAM	7/1/2005	Age 55 with 20 years of service, Age 50 with 25 years of service, or Age 60 with 15 years of service
Police/PSA/Command/Detectives	3/27/2009	20 years of service
Fire	7/1/2009	20 years of service or Age 55 with 15 years of service
Police/Fire Department Heads		Since promoted from within, they revert back to Police or Fire group (original group hired into).

SECTION D

SUMMARY OF THE INFORMATION SUBMITTED FOR THE VALUATION

Reported Financial Information
for the Year Ended June 30, 2018 (Market Value)

Revenues and Expenditures During the Year

Revenues:		
a. Retiree contributions	$ 0	
b. Employer contributions	716,492	
c. Interest and dividends	2,231,640	
d. Net Appreciation in Fair Value of Investments	4,627,086	
e. Other	508,115	
f. Total		$8,083,333
Expenditures:		
a. Benefits paid	7,670,977	
b. Administrative expenses	257,029	
c. Miscellaneous expenses	1,119	
d. Total		7,929,125
Reserve Increase:		
Total revenues minus total expenditures		$154,208

Assets

Assets:	
a. Cash or equivalents	($656,480)
b. Receivables net of payables	414,883
c. Stocks	0
d. Fixed income	0
e. Real Estate Investment Fund	0
f. Mutual Funds	132,719,509
Total	$132,477,912

Total Active Members as of June 30, 2018
by Age and Years of Service

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
35-39			8	3				11	$ 803,461
40-44			10	15	2			27	2,060,767
45-49			4	13	19	2		38	2,804,620
50-54			3	8	13	4	1	29	2,302,284
55-59			2	8	10	7	2	29	1,911,486
60-64			1	5	5	2	2	15	962,620
65 & Over			2	1			2	5	376,596
Totals			**30**	**53**	**49**	**15**	**7**	**154**	**$11,221,834**

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

Age:	50.4	years
Service:	20.1	years
Annual Pay:	$72,869	

General Active Members as of June 30, 2018
by Age and Years of Service

	Years of Service to Valuation Date							Totals	
Age	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
35-39			3	1				4	$ 252,890
40-44			3	3	2			8	549,794
45-49			3	4	5	1		13	717,742
50-54			2	6	6	1	1	16	1,102,943
55-59			1	7	8	5	2	23	1,341,811
60-64			1	5	5	2	2	15	962,620
65 & Over			2	1			2	5	376,596
Totals			**15**	**27**	**26**	**9**	**7**	**84**	**$ 5,304,396**

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

Age:	53.7	years
Service:	21.0	years
Annual Pay:	$63,148	

Police and Fire Active Members as of June 30, 2018
by Age and Years of Service

	Years of Service to Valuation Date							Totals	
Age	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
35-39			5	2				7	$ 550,571
40-44			7	12				19	1,510,973
45-49			1	9	14	1		25	2,086,878
50-54			1	2	7	3		13	1,199,341
55-59			1	1	2	2		6	569,675
60-64									
65 & Over									
Totals			**15**	**26**	**23**	**6**		**70**	**$ 5,917,438**

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

Age:	46.5	years
Service:	19.1	years
Annual Pay:	$84,535	

Total Retired and Deferred Members as of June 30, 2018 by Age

Age	Retired Members	
	General	Police/Fire
Under 55	3	35
55-59	11	29
60-64	29	28
65 & Over	153	137
Totals	**196**	**229**

The number counts above only include those retirees who have elected to receive retiree health care coverage through the City of Royal Oak retiree health care plan.

Age	Deferred Members	
	General	Police/Fire
Under 55	1	1
55-59	0	0
60-64	0	0
65 & Over	0	0
Totals	**1**	**1**

The number counts above only include those deferred vested who are eligible based on service at termination to receive retiree health care coverage through the City of Royal Oak retiree health care plan.

SECTION E

ACCOUNTING INFORMATION

Accounting Information

Valuation Date	June 30, 2018
Actuarial Cost Method	Individual Entry Age
Amortization Method	Level Dollar Closed
Remaining Amortization Periods	20 Years
Asset Valuation Method	Market Value
Actuarial Assumptions:	
Investment Rate of Return	7.25%
Projected Salary Increases	3.0% - 5.2%
Health Care Cost Trend Rate	9% Initial 3.0% Ultimate

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Valuation Methods

Actuarial Cost Method. Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an **Individual Entry-Age Actuarial Cost Method** having the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains (losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Financing of Unfunded Actuarial Accrued Liabilities. Unfunded Actuarial Accrued Liabilities (UAAL) (full funding credit if assets exceed liabilities) were amortized by level (principal & interest combined) percent-of-payroll contributions. The UAAL was determined using the funding value of assets and actuarial accrued liability calculated as of the valuation date. The UAAL amortization payment (one component of the contribution requirement), is the level dollar amount required to fully amortize the UAAL over a 20-year period beginning with the fiscal year ending June 30, 2020. This UAAL payment does not reflect any payments expected to be made between the valuation date and the fiscal year for which the contributions in this report have been calculated.

Actuarial Value of System Assets. Last year's valuation assets are increased by contributions, expected investment income on last year's valuation assets and non-investment net cash flow, and reduced by refunds, benefit payments and expenses. To this amount is added the phased-in recognition of investment income. The phased-in recognition is the sum over the five years ending on the valuation date of 20% of the difference between each year's expected return and actual market return.

The following amortization factors were used in developing the Annual Recommended Contribution for the fiscal year shown.

	Fiscal Year Ending	
7.25% Interest	**June 30, 2020**	**June 30, 2021**
General (Level Dollar)	10.7635	10.5081
Police & Fire (Level Dollar)	10.7635	10.5081

Actuarial Assumptions

The rationale for the rates of merit and seniority salary increase, retirement rates, early retirement rates, rates of separation from active membership, and disability rates used in this valuation is included in the City of Royal Oak Retirement System's 5-year Experience Study Report, dated September 28, 2018, for the period of July 1, 2012 through June 30, 2017.

The rate of investment return was 7.25% a year, compounded annually net after investment and administrative expenses.

The assumed real return is the rate of return in excess of price inflation. Considering other assumptions used in the valuation, the 7.25% nominal rate translates to a net real return of 4.25% a year.

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which future contributions will be based.

	% Increase in Salary at Sample Ages				
Sample	Merit and Seniority		Base	Increase Next Year	
Ages	General	Police/Fire	(Economic)	General	Police/Fire
20	2.16%	1.69%	3.00%	5.16%	4.69%
25	1.76%	1.69%	3.00%	4.76%	4.69%
30	1.51%	1.69%	3.00%	4.51%	4.69%
35	1.34%	1.18%	3.00%	4.34%	4.18%
40	1.20%	0.44%	3.00%	4.20%	3.44%
45	0.94%	0.14%	3.00%	3.94%	3.14%
50	0.64%	0.08%	3.00%	3.64%	3.08%
55	0.37%	0.02%	3.00%	3.37%	3.02%
60	0.09%	0.00%	3.00%	3.09%	3.00%
65	0.00%	0.00%	3.00%	3.00%	3.00%
Ref	760	761	3.00%		

The number of active members is assumed to decrease in the future.

Actuarial Assumptions (Continued)

The mortality tables used were as follows:

- **Healthy Pre-Retirement:** The RP-2014 Employee Generational Mortality Tables, with blue-collar adjustments and extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale, resulting in a base year of 2006 with future mortality improvements assumed each year using scale MP-2017.

- **Healthy Post-Retirement:** The RP-2014 Healthy Annuitant Generational Mortality Tables, with blue-collar adjustments and extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale, resulting in a base year of 2006 with future mortality improvements assumed each year using scale MP-2017.

- **Disability Retirement:** The RP-2014 Disabled Mortality Table, extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale, resulting in a base year of 2006 with future mortality improvements assumed each year using scale MP-2017.

Sample Attained Ages	Healthy Pre-Retirement Future Life Expectancy (Years)*		Healthy Post-Retirement Future Life Expectancy (Years)*		Disabled Retirement Future Life Expectancy (Years)*	
	Men	Women	Men	Women	Men	Women
55	29.64	34.86	28.41	31.27	21.11	24.86
60	24.82	29.89	23.88	26.58	18.11	21.36
65	20.36	25.04	19.64	22.11	15.28	17.97
70	16.29	20.33	15.72	17.85	12.55	14.59
75	12.55	15.81	12.12	13.89	9.93	11.44
80	9.21	11.57	8.98	10.39	7.56	8.71

** Based on retirements in 2018. Retirements in future years will reflect improvements in life expectancy.*

Actuarial Assumptions (Continued)

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

Percents of Active Members Retiring within Next Year

Retirement Ages	General	Police Service Aides	Fire Hired Before 10/1/09 & All Police	Fire Hired After 10/1/09	Retirement Service	All Police, Police and Fire Department Heads, and Fire Hired Before 10/1/09
45-49						
50	20%	22.5%		50%	25	50%
51	15%	17.5%		50%	26	50%
52	15%	17.5%		50%	27	50%
53	15%	17.5%		30%	28	30%
54	15%	17.5%		30%	29	30%
55	15%	17.5%	30%	30%	30	30%
56	15%	17.5%	30%	30%	31	30%
57	15%	17.5%	30%	30%	32	30%
58	15%	17.5%	30%	30%	33	30%
59	15%	17.5%	30%	30%	34	30%
60	15%	17.5%	30%	30%	35	30%
61	15%	17.5%	30%	30%	36	30%
62	35%	37.5%	30%	30%	37	30%
63	20%	22.5%	30%	30%	38	30%
64	20%	22.5%	30%	30%	39	30%
65	55%	100%	100%	100%	40	100%
66	45%					
67	45%					
68	45%					
69	45%					
70	100%					
Ref.	2321	2549	2550	2550		2550

Actuarial Assumptions (Continued)

Rates of disability among active members.

Sample Ages	Percent Becoming Disabled Within Next Year			
	General		Police/Fire	
	Males	Females	Males	Females
20	0.04%	0.02%	0.08%	0.08%
25	0.05%	0.03%	0.11%	0.11%
30	0.05%	0.04%	0.19%	0.19%
35	0.07%	0.07%	0.23%	0.23%
40	0.11%	0.10%	0.53%	0.53%
45	0.16%	0.14%	0.60%	0.60%
50	0.26%	0.23%	0.71%	0.71%
55	0.46%	0.38%	0.83%	0.83%
Ref	#33x0.5	#34x0.5	#45x0.75	#45x0.75

Rates of separation from active membership were as shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Service Index	Percent of Active Members Separating Within Next Year			
		General		Police/Fire	
		Males	Females	Males	Females
ALL	1	12.00%	12.00%	10.00%	10.00%
	2	9.00%	9.00%	7.00%	7.00%
	3	7.00%	7.00%	5.00%	5.00%
	4	5.00%	5.00%	4.00%	4.00%
	5	4.50%	4.50%	3.50%	3.50%
20	6 & Over	4.50%	4.50%	2.50%	2.50%
25		4.50%	4.50%	2.50%	2.50%
30		4.00%	4.00%	2.00%	2.00%
35		3.50%	3.50%	1.25%	1.25%
40		2.50%	2.50%	0.75%	0.75%
45		2.00%	2.00%	0.50%	0.50%
50		1.50%	1.50%	0.25%	0.25%
55		1.00%	1.00%	0.25%	0.25%
Ref		29	29	30	30
		#1300x1	#1300x1	#1177x1	#1177x1

Actuarial Assumptions (Concluded)

Health cost increases – See table below.

Year Beginning July 1,*	Medical & Drug	Dental & Vision
2019	9.00%	3.00%
2020	8.25	3.00
2021	7.50	3.00
2022	6.75	3.00
2023	6.00	3.00
2024	5.25	3.00
2025	4.50	3.00
2026	4.00	3.00
2027	3.50	3.00
2028 & Later	3.00	3.00

** Except for Medicare Part B Reimbursement which increases on January 1 each year.*

Miscellaneous and Technical Assumptions

Decrement Operation	Disability and mortality decrements do not operate during the first 5 years of service. Disability also does not operate during retirement eligibility.
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.
Incidence of Contributions	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Marriage Assumption	90% of males and females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Pay Increase Timing	Beginning of year.
Medicare Coverage	Assumed to be available for all covered employees on attainment of age 65.
Election Percentage	It was assumed that 95% of eligible future retirees would choose to receive retiree health care benefits through the City. Of those assumed to elect coverage, 70% of males and 70% of females in the General groups were assumed to elect two-person coverage and 80% of males and 80% of females in the Police/Fire groups were assumed to elect two-person coverage, if eligible. For those that elect two-person coverage, it was assumed that coverage would continue to the spouse upon death of the retiree, if eligible.

APPENDIX

Glossary

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability".

Actuarial Assumptions. Estimates of future plan 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 plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method".

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Actuarially Computed Employer Contribution. The Actuarially Computed Employer Contribution is the normal cost plus the portion of the unfunded actuarial accrued liability to be amortized in the current period. The Actuarially Computed Employer Contribution is an amount that is actuarially determined in accordance with the requirements so that, if paid on an ongoing basis, it would be expected to provide sufficient resources to fund both the normal cost for each year and the amortized unfunded liability.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Glossary (Concluded)

Governmental Accounting Standards Board (GASB). GASB is the private, nonpartisan, nonprofit organization that works to create and improve the rules U.S. state and local governments follow when accounting for their finances and reporting them to the public.

Implicit Rate Subsidy. It is common practice for employers to allow retirees to continue in the employer's group health insurance plan (which also covers active employees), often charging the retiree some portion of the premium charged for active employees. Under the theory that retirees have higher utilization of services, the difference between the true cost of providing retiree coverage and what the retiree is being charged is known as the implicit rate subsidy.

Medical Trend Rate (Health Care Inflation). The increase in the cost of providing health care benefits over time. Trend includes such elements as pure price inflation, changes in utilization, advances in medical technology, and cost shifting.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Other Postemployment Employee Benefits (OPEB). OPEB are postemployment benefits other than pensions. OPEB generally takes the form of health insurance and dental, vision, prescription drugs or other health care benefits.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability".

Valuation Assets. The value of current plan assets recognized for valuation purposes.

GRS Retirement Consulting

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November 27, 2018

Ms. Julie Rudd
Finance Director
City of Royal Oak
211 S. Williams Street
Royal Oak, Michigan 48067

Re: Retiree Health Care Plan

Dear Ms. Rudd:

Enclosed are 15 copies of our report of the actuarial valuation of the City of Royal Oak Retiree Health Care Plan.

Respectfully submitted,

Mark Buis

Mark Buis, FSA, EA, FCA, MAAA

MB:sc
Enclosures

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723