

City of Farmington Hills Employees' Retirement
System – Basic Retirement Benefits
Actuarial Valuation Report
as of June 30, 2018



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November 15, 2018

The Retirement Board
City of Farmington Hills
Employees' Retirement System
31555 Eleven Mile Road
Farmington Hills, Michigan 48336

Ladies and Gentlemen:

The results of the June 30, 2018 annual actuarial valuation of the City of Farmington Hills Employees' Retirement System are presented in this report. The purpose of the valuation was to measure the System's funding progress and to determine the employer contribution for the 2019-2020 fiscal year. This report should not be relied upon for any other purpose. This report may be distributed to parties other than the Retirement Board only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The valuation was based on the assumptions and methods adopted by the Board and upon information, furnished by the Finance Director, concerning Retirement System benefits, financial transactions, individual members, terminated members, retirees and beneficiaries. Data was checked for internal and year-to-year consistency, but was not audited, by us. As a result, we are unable to assume responsibility for the accuracy or completeness of the data provided.

Future actuarial measurements may differ significantly from those presented in this report due to such factors as experience differing from that anticipated by actuarial assumptions, changes in plan provisions, actuarial assumptions/methods or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. This valuation was based on the assumption that the plan sponsor will continue to be able to make all necessary contributions in the future. The determination of the plan sponsor's ability to make future contributions is beyond the scope of our ability and beyond the scope of this report.

The employer contribution shown in Section A may be considered a minimum contribution that complies with the Board's funding policy and state law. Users of this report should be aware that contributions made at this level 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.

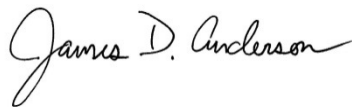
In addition, the contribution shown in this report was determined based on the actuarial assumptions and methods shown in Section D of this report. This report includes risk metrics shown on page E-1 but does not include a more robust assessment of the risk of future experience not meeting actuarial assumptions. Additional assessment of risks was outside of the scope of this assignment. We encourage a review and assessment of investment and other significant risks which may have a material effect on the System's financial condition.

To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board and in compliance with the applicable state statutes. Louise M. Gates and James D. Anderson are independent of the plan sponsor and are Members of the American Academy of Actuaries (MAAA) who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. It is our opinion that the actuarial assumptions used for the valuation produce results which are reasonable.

Respectfully submitted,



Louise M. Gates, ASA, FCA, MAAA



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



SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1. Required Employer Contributions - Fiscal Year Beginning July 1, 2019

The required City contributions for each employment division are as follows:

Division	Required Employer Contribution	
	% of Payroll	\$ Based on Projected Payroll
General	N/A	\$2,314,162
Court	N/A	261,705
Police	27.13%	2,378,241
Fire	21.20	973,481

The General and Court groups are closed to new hires. As a result, we have calculated the employer contributions using a financing method that is appropriate for these circumstances.

2. Contribution Comparison

The table below compares the results of this valuation with the results of the 2017 actuarial valuation of the System. Contributions are expressed as both percentages of payroll and dollar amounts where appropriate.

Division	Required Contributions by Indicated Valuation Date	
	6/30/2017	6/30/2018
General	\$ 2,180,113	\$ 2,314,162
Court	263,302	261,705
Police	2,201,997	2,378,241
Fire	932,051	973,481
Total	\$ 5,577,463	\$ 5,927,589

3. 2018 Funding Position

This year valuation assets represent 83% of accrued liabilities compared to last year's valuation where the funded percent was 84%. If the market value of assets was used in the development of the System's funded percent, the System would be 81% funded as of June 30, 2018.

4. Reasons for Change

There are three general reasons why contribution rates change from one valuation to the next. The first is a change in the benefits or eligibility conditions of the Plan. The second is a change in the valuation assumptions or methods used to predict future occurrences. The third is the difference during the year between the System's actual experience and what the assumptions predicted.

This valuation of the System reflects the following change in practice. The System now pre-funds pension stipend benefits for eligible individuals. This change increased System accrued liabilities by \$866,000 as of the valuation date.

5. 2018 Plan Experience

System experience for the year ending June 30, 2018 was overall unfavorable. During the 2017-2018 plan year the rate of investment return on System assets was slightly higher than long term expectations. However, the market smoothing techniques used in this valuation of the System recognize both current and prior investment experience and as a result the recognized rate of investment return for the year was 6.46%. Additional information related to the investment experience is shown on pages C-3 and C-4. In addition, retirees during the year from the Police division received higher benefits than anticipated by valuation assumptions which contributed to the experience loss. Although the plan change and unfavorable experience increased City contributions to the System, this increase was offset in part by additional City contributions made to the pension plan during the year.

6. Retiree Reserve Balance

In each valuation, we develop the value of anticipated future benefit payments to retired members and their beneficiaries. We then compare this liability to the reported assets in the Retirement Reserve Fund. The liability amounts and the reported reserves are shown below.

	<u>General/Court</u>	<u>Police</u>	<u>Fire</u>	<u>Total</u>
Retiree Liability	\$50,350,779	\$48,404,732	\$8,225,457	\$106,980,968
Retiree Reserve	<u>45,790,795</u>	<u>44,105,024</u>	<u>8,253,855</u>	<u>98,149,674</u>
Shortfall / (Surplus)	4,559,984	4,299,708	(28,398)	8,831,294

The differences shown above could be covered by a transfer from the Retirement System's employer reserves to the retirement reserve fund.

7. Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based on the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with respect to any funded status measurement presented in this report:

- The measurement is inappropriate for assessing the sufficiency of System assets to cover the estimated cost of settling the System's benefit obligations.
- The measurement is inappropriate for assessing the need for or the amount of future employer contributions.
- The measurement will produce a different result if the market value of System assets is used instead of the actuarial value of System assets.

8. Other

Michigan Public Act 202 of 2017 has created new reporting and other requirements for local units of government. The Board may be asked to assist the City in its efforts to comply with these new requirements. We would be happy to assist the Board in its efforts to develop policies and procedures to facilitate compliance.

Given the current economic environment and elapsed time since the last study, we recommend a review of Retirement System assumptions for use in the annual valuations of the pension plan.

SECTION B

VALUATION RESULTS

Financial Objective

The financial objective of the Retirement System is to establish and receive contributions, expressed as a percentage of active member payroll (for open groups), which will remain approximately level from year-to-year and will not have to be increased for future generations of citizens. The contributions, when combined with present assets and future investment income, will be sufficient to meet the financial obligations of the fund to present and future retirees and beneficiaries. Your annual actuarial valuations determine how well the objective is being met.

The contribution requirements for the fiscal year beginning July 1, 2019 are presented on the following page.

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.40% on the actuarial value of assets), it is expected that:

- (1) The employer normal cost contributions are expected to decrease due to the closure of the General and Court groups;
- (2) The unfunded actuarial accrued liabilities will be fully amortized after 25 years; and
- (3) The funded status of the plan will increase gradually towards a 100% funded ratio.

Contributions to Provide Benefits for the Fiscal Year Beginning July 1, 2019 Member and Employer Portions

Contributions for	% of Active Payroll			
	General	Court	Police	Fire
Normal cost of benefits:				
Age and service	\$ 672,405	\$ 194,167	16.89%	17.58%
Disability	4,695	1,167	0.17	0.18
Death before retirement	29,212	6,356	0.71	0.72
Stipend	1,043	259	0.05	0.05
Total	707,355	201,949	17.82	18.53
Member contributions				
Total	234,742	58,367	4.50	4.50
Future refunds	47,992	6,356	0.36	0.34
Available for pensions	186,750	52,011	4.14	4.16
Administrative expenses	122,046	14,529	1.15	1.15
Employer normal cost	642,651	164,467	14.83	15.52
Unfunded accrued liability payment	1,671,511	97,238	12.30	5.68
Computed employer contribution	<u>\$2,314,162</u>	<u>\$261,705</u>	<u>27.13%</u>	<u>21.20%</u>

Unfunded accrued liabilities were amortized over 9 years for the General group, 12 years for the Court Group, and over 25 years for the Police and Fire groups. A closed, level dollar amortization method was used for the General and Court groups, due to the closure of these groups to new employees. A closed, level percent of payroll amortization method was used for the Police and Fire groups due to the open nature of these groups.

Determination of Unfunded Accrued Liability as of June 30, 2018

	<u>General</u>	<u>Court</u>	<u>Police</u>	<u>Fire</u>	<u>Total</u>
A. Accrued Liability					
1. For retirees and beneficiaries	\$48,200,290	\$2,150,489	\$48,404,732	\$ 8,225,457	\$ 106,980,968
2. For vested terminated members	281,302	262,548	747,110	1,073,674	2,364,634
3. For present active members					
a. Value of expected future benefit payments	33,467,203	7,349,097	47,456,258	23,555,836	111,828,394
b. Value of future normal costs	4,585,119	1,485,131	14,853,716	7,419,061	28,343,027
c. Active member liability: (a) - (b)	<u>28,882,084</u>	<u>5,863,966</u>	<u>32,602,542</u>	<u>16,136,775</u>	<u>83,485,367</u>
4. Total	77,363,676	8,277,003	81,754,384	25,435,906	192,830,969
B. Valuation Assets	<u>66,654,028</u>	<u>7,520,710</u>	<u>64,461,296</u>	<u>21,256,056</u>	<u>159,892,090</u>
C. Unfunded Accrued Liability (A.4) - (B)	<u>10,709,648</u>	<u>756,293</u>	<u>17,293,088</u>	<u>4,179,850</u>	<u>32,938,879</u>
D. Funding Ratio: (B) / (A.4)	<u>86%</u>	<u>91%</u>	<u>79%</u>	<u>84%</u>	<u>83%</u>

Development of Experience Gain/(Loss) Period Ended June 30, 2018

Actual experience will never (except by coincidence) exactly match assumed experience. It is hoped that gains and losses will cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below.

	All Groups Combined
(1) UAAL* at start of period	\$ 30,212,475
(2) Normal cost for period	2,808,834
(3) Actual contributions	5,753,424
(4) Interest accrual on (1), (2) and (3)	2,126,774
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	29,394,659
(6) Change from plan provisions	865,762
(7) Change in actuarial assumptions/methods	0
(8) Expected UAAL after changes: (5) + (6) + (7)	30,260,421
(9) Actual UAAL at end of period	32,938,879
(10) Gain/(loss): (8) - (9)	(2,678,458)
(11) Gain/(loss) as percent of actuarial accrued liabilities at start of period	(1.44%)

* *Unfunded Actuarial Accrued Liabilities*

SECTION C

SUMMARY OF BENEFIT PROVISIONS

Brief Summary of Basic Benefit Provisions (June 30, 2018)

Normal Retirement (No reduction for age.)						
Group	Eligibility	Age Change	FAC ⁽¹⁾ Times Sum of		Maximum Benefit ⁽²⁾	Member Contributions
			Up To 25 Years	Over 25 Years		
AFSCME ⁽³⁾	60 & 8 or Sum of Age & Service equals 80 (minimum age 55)	None	2.80 %	1.00 %	75 %	4.50%
Teamsters, Exempt, and Court ^{(3),(4)}	60 & 8 or Sum of Age & Service equals 80 (minimum age 55)	None	2.80	1.00	80	4.50%
Dispatchers (Group D) ⁽³⁾	60 & 8 Sum of Age & Service equals 80 (minimum age 55)	Until Age 67 At Age 67	2.65 2.375	1.00 1.00	70	4.50%
Executive ⁽³⁾	60 & 8 or Sum of Age & Service equals 80 (minimum age 55)	None	3.00	1.00	80	4.50%
Police Command	50 & 25 or 30 years of service with 25 years as Police Officer	None	3.00	1.00	80	4.50%
Fire Hired before July 1, 2008 and Police Patrol Hired before January 1, 2008	25 & Out	None	2.80	1.00	75	4.50%
Fire Hired after July 1, 2008 and Police Patrol Hired after January 1, 2008	50 & 25	None	2.25	1.00	60	4.50%

Early Retirement (Computed as regular retirement with an age reduction factor used.)		
Group	Eligibility	Reduction
Teamsters and Dispatchers	57 & 8	1/2 of 1% for each month by which retirement precedes age 60
AFSCME, Executive, Exempt, and Court	57 & 8	2/10 of 1% for each month by which retirement precedes age 60
Police Command	50 & 15 <50 & 25	2/10 of 1% for each month by which retirement precedes age 55 6/10 of 1% for each month by which retirement precedes age 50
Police Patrol	50 & 20	2.08/10 of 1% for each month by which retirement precedes age 55
Fire	50 & 20	2/10 of 1% for each month by which retirement precedes age 55

⁽¹⁾ Type of final average compensation (FAC): highest 3 consecutive years out of last 10. FAC includes longevity pay for civilian members and longevity and holiday pay for Police, Fire and Dispatch members.

⁽²⁾ Maximum benefit is computed as a percent of FAC.

⁽³⁾ All Civilian groups have been closed to new hires.

⁽⁴⁾ Three Court employees are covered by the Executive group benefit structure.

Brief Summary of Basic Benefit Provisions (June 30, 2018)

Eligibility	Amount
Deferred Retirement	
General: 8 or more years of service. Benefit generally begins at age 60.	Computed as a regular or early retirement but based upon service and final average compensation at termination date.
Police and Fire: 15 or more years of service. Benefit generally begins at age 55.	
Non-Duty Death	
10 or more years of service, or age 57 with 8 years of service.	Computed as a regular retirement but actuarially reduced in accordance with a 100% joint and survivor option.
Duty Death	
No age or service requirements.	Surviving spouse pension computed as a duty disability retirement.
Duty Disability	
No age or service requirements.	General: 40% of compensation at time of disability, plus 10% of compensation (not to exceed 25% of total) for each unmarried child under age 18. Other disability payments offset. Police and Fire: 66-2/3% of final compensation.

Defined Benefit Plan Eligibility

Employees hired after July 1, 2006 in the AFSCME, General and Executives employment groups are not covered by this plan. Employees hired after January 1, 2007 in the Dispatch group and employees hired after January 1, 2008 in the Teamsters group are not covered by this defined benefit plan. Employees hired after September 1, 2015 in the Court division are not covered by this defined benefit plan. The System remains "open" to new Police Command Officers, Police Officers, and Fire Fighters.

Other

Eligible Retiree Health Care (RHC) Plan members who also participate in this plan may elect to receive a monthly pension stipend benefit ranging from \$200-\$400 per month and paid from the pension trust. This stipend benefit is paid in lieu of traditional RHC plan benefits.

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

Revenues and Disbursements

Revenues:

a. Member contributions	\$ 914,276		
b. Employer contributions	5,753,424		
c. Interest and dividends	2,504,963		
d. Gain on sale of investments	6,985,451		
e. Other Investment Income	2,720,694		
f. Total			\$ 18,878,808

Disbursements:

a. Refunds of member contributions	99,651		
b. Benefits paid	11,364,103		
c. Investment Expenses	1,080,082		
d. Administrative Expenses	<u>289,010</u>		
e. Total			<u>12,832,846</u>

Reserve Increase

Total revenues minus total disbursements			
net increase in plan assets			<u>\$ 6,045,962</u>

Assets and Reserves

Investments

a. Cash and Deposits	\$ 10,204,332
b. Receivables	37,928
c. Fixed Income	53,205,502
d. Equities	71,678,692
e. Real Estate	11,754,602
f. Hedge Funds	8,995,341
g. Accounts Payable	<u>(250,484)</u>

Reserve Accounts

a. Member contributions	\$ 17,375,658
b. Reserve for benefits now being paid	98,149,674
c. Reserve for future benefits	40,100,581
d. Reserve for undistributed income	<u>0</u>

Total Net Assets \$155,625,913

Total \$155,625,913

Development of Valuation Assets

Valuation Date June 30:	2016	2017	2018	2019	2020	2021	2022
1. Beginning of Year Assets							
a) Market Value	\$ 145,286,413	\$ 137,940,808	\$ 149,792,751				
b) Valuation Assets	148,299,323	150,257,018	155,325,541				
c) Audit Adjustment			(212,800)				
2. End of Year Market Value Net Assets	137,940,808	149,792,751	155,625,913				
3. Net Additions to Market Value							
a) Net Contributions and Other Income	5,618,585	5,624,863	6,667,700				
b) Net Investment Income	(2,531,824)	17,168,981	11,131,026				
c) Benefit Payments and Refunds *	(10,432,366)	(10,941,901)	(11,752,764)				
d) Total Additions to Market Value	(7,345,605)	11,851,943	6,045,962				
4. Average Valuation Assets	145,892,433	147,598,499	152,783,009				
5. Expected Income at Valuation Rate	10,941,932	11,069,887	11,305,943				
6. Gain (Loss) = (3b) - (5)	(13,473,756)	6,099,094	(174,917)				
7. Phased-In Recognition of Investment Return							
a) Current Year: 0.2 x (6)	(2,694,751)	1,219,819	(34,983)				
b) First Prior Year	(2,396,196)	(2,694,751)	1,219,819	\$ (34,983)			
c) Second Prior Year	2,464,581	(2,396,196)	(2,694,751)	1,219,819	\$ (34,983)		
d) Third Prior Year	722,221	2,464,581	(2,396,196)	(2,694,751)	1,219,819	\$ (34,983)	
e) Fourth Prior Year	(2,266,311)	722,221	2,464,581	(2,396,196)	(2,694,751)	1,219,819	\$ (34,983)
f) Total Recognized Investment Gain/ (Loss)	(4,170,456)	(684,326)	(1,441,530)	(3,906,111)	(1,509,915)	1,184,836	(34,983)
8. Change in Valuation Assets (3a) + (3c) + (5) + (7f)	1,957,695	5,068,523	4,779,349				
9. End of Year Valuation Assets	150,257,018	155,325,541	159,892,090				
10. Recognized Rate of Return	4.64%	7.04%	6.46%				
11. Market Rate of Return	(1.77%)	12.69%	7.57%				

* Includes administrative expenses

Retired and Inactive Members

Data as of June 30, 2018

	Total Number	Annual Benefits*	Average Age
Benefit Recipients	318	\$9,912,126	68.3
Deferred Vested Members	14	\$ 366,555	47.7

**excludes pension stipend payments*

Active Members

Comparative Schedule

Valuation Date*	Active Members					Valuation Payroll	Average			
	General	Court	Police	Fire	Totals		Age	Service	Pay	% Inc.
2003	265	**	114	40	419	\$22,246,938	43.9 yrs.	11.8 yrs.	\$53,095	4.4%
2004	263	**	111	40	414	22,612,504	44.1	11.9	54,620	2.9
2006	259	**	115	40	414	23,302,473	44.5	12.3	56,286	3.1
2007	252	**	120	44	416	24,080,517	44.9	12.8	57,886	2.8
2008	239	**	118	45	402	24,662,884	45.3	13.4	61,350	6.0
2009	225	**	117	44	386	24,904,782	46.0	14.3	64,520	5.2
2010	181	**	105	41	327	21,749,242	45.0	13.8	66,511	3.1
2011	148	27	102	41	318	21,236,510	45.8	14.9	66,781	0.4
2012	133	26	102	40	301	20,415,113	45.7	15.1	67,824	1.6
2013	123	26	105	45	299	19,898,614	45.0	14.6	66,551	(1.9)
2014	111	25	105	47	288	19,549,678	45.1	14.9	67,881	2.0
2015	108	24	103	48	283	20,047,647	45.7	15.3	70,840	4.4
2016	101	23	102	51	277	20,046,105	45.8	15.5	72,369	2.2
2017	94	23	101	51	269	20,089,578	46.2	15.8	74,682	3.2
2018	84	23	101	51	259	19,941,526	46.0	15.9	76,994	3.1

* Years prior to 2006 had a valuation date of December 31st.

** Included with General division prior to the June 30, 2011 valuation.

Active Members by Age and Years of Service

Age	Years of Service on Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	6							6	\$ 326,391
25-29	8	2						10	656,236
30-34	10	12	4					26	1,967,947
35-39	5	11	22	8				46	3,499,910
40-44	1	2	7	10	4			24	1,957,145
45-49	1	1	9	6	26	4		47	3,986,316
50-54	1	1	2	3	15	8	8	38	3,114,421
55-59			6	7	11	1	5	30	2,355,428
60			3		2			5	323,386
61			2	1		1	1	5	333,962
62				3		1		4	284,178
63			1	2	2	1		6	324,369
64				1			1	2	173,263
65					1			1	102,130
66			1	1	1			3	150,919
67				2				2	116,176
68					1	1		2	160,826
70			1					1	62,360
76				1				1	46,163
Totals	32	29	58	45	63	17	15	259	\$19,941,526

SECTION D

SUMMARY OF VALUATION METHODS AND ASSUMPTIONS

Valuation Methods

Actuarial Cost Method: Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the hire date to the date of retirement, are sufficient to accumulate to the value of the member's benefit earned.
- (ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Asset Valuation Method: The actuarial value equals:

- (a) Actuarial value of assets from the previous valuation, plus
- (b) employer and member contributions since the last valuation, minus
- (c) benefit payments and refunds since the last valuation, plus
- (d) estimated investment income at the assumed investment return, plus
- (e) portion of gain (loss) recognized in the current valuation.

For the above purpose, gain (loss) is defined as the excess during the period of the investment return on the market value of assets over the expected investment income. 20% of the difference is recognized over a 5-year period in the actuarial value of assets.

This method was first adopted for the December 31, 2003 actuarial valuation. Valuation dates prior to 2006 were December 31st of each year.

The Funding Value of Assets is allocated between groups based on actual group experience and investment income such that each group's return equals the return for the System in total.

Amortization of Unfunded Actuarial Accrued Liabilities: Unfunded actuarial accrued liabilities were amortized by level percent-of-payroll contributions over 25 years for the Police and Fire groups. The period is reduced with each annual actuarial valuation. The amortization method was first used for the December 31, 2013 actuarial valuation. Active member payroll was assumed to increase 3.5% for the purpose of determining the level-percent contributions.

A level dollar amortization method (principle and interest combined) was used for the General and Court groups. The amortization periods are 9 years for the General group and 12 years for the Court group. The period is reduced with each annual actuarial valuation. This method was first adopted for the June 30, 2006 actuarial valuation for the General group and June 30, 2015 for the Court group.

Actuarial Assumptions Used for the Valuation

Investment Return (net of investment expenses): 7.40% per year compounded annually. This rate consists of a real rate of return of 3.9% a year plus a long-term assumed rate of wage inflation of 3.5% per year.

This assumption is used to equate the value of payments due at different points in time and was first used for the December 31, 2003 valuation. Approximate rates of investment return, for the purpose of comparisons with assumed rates, are shown below. Actual increases in average active member pay are also shown for comparative purposes.

	Period Ended June 30,				
	2018	2017	2016	2015	2014
Rate of Investment Return (Recognized on Valuation Assets)	6.5%	7.0%	4.6%	6.6%	8.3%

These rates of return should not be used for measurement of an investment advisor's performance or for comparisons with other systems.

Pay Projections: These assumptions are used to project current pays to those upon which benefits will be based. The assumptions were first used for the June 30, 2013 valuation.

Annual Rate of Pay Increase

Years of Service	General and Court Members		
	Base (Economic)	Merit & Longevity	Total
1 to 5	3.5%	4.0%	7.5%
6 to 10	3.5%	2.0%	5.5%
thereafter	3.5%	1.0%	4.5%

Annual Rate of Pay Increase

Years of Service	Police Members			Fire Members		
	Base (Economic)	Merit & Longevity	Total	Base (Economic)	Merit & Longevity	Total
1	3.5%	20.0%	23.5%	3.5%	17.0%	20.5%
2	3.5%	15.0%	18.5%	3.5%	12.0%	15.5%
3	3.5%	7.0%	10.5%	3.5%	12.0%	15.5%
thereafter	3.5%	1.0%	4.5%	3.5%	1.0%	4.5%

If the number of active members (in the open groups) remains constant, the total active member payroll will increase 3.5% annually, the base portion of the individual pay increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities for the Police and Fire groups.

Changes actually experienced in pay have averaged as follows:

	Period Ended June 30,				
	2018	2017	2016	2015	2014
Average Increase in Pay@	4.0%	4.3%	4.0%	4.6%	2.6%

@ Excludes new hires and terminations.

The mortality table (a risk assumption) used was the RP-2000 Mortality Combined Healthy Tables, projected 20 years with U.S. Projection Scale BB. This table was first used for the June 30, 2013 valuation. Sample values follow:

Sample Ages	Single Life Retirement Values			
	Present Value of \$1 Monthly for Life*		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	\$146.08	\$149.34	32.99	35.59
55	138.74	142.92	28.37	30.90
60	129.57	134.60	23.94	26.34
65	118.45	124.30	19.74	21.98
70	105.27	112.23	15.83	17.93
75	90.22	98.54	12.26	14.25
80	74.06	83.44	9.13	10.95

* Reflects the 7.40% interest rate assumption.

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each pension payment being made after retirement. The RP-2000 Mortality Combined Healthy Tables, projected 20 years with U.S. Projection Scale BB with ages set forward 4 years was used for disabled lives.

75% of deaths are assumed to be non-duty for the General and Court groups, while 50% of deaths are assumed to be non-duty for the Police and Fire groups.

Rates of Retirement: These rates are used to measure the probability of eligible members retiring during the next year. Early retirement rates do not apply to members eligible for regular retirement.

Retirement Ages	Percent of Eligible Active Members Retiring			
	General & Court	Police Command	Years of Service	Police Command
50		15%	25	
51		15	26	
52		15	27	
53		15	28	
54		15	29	
55	30%	15	30	40%
56	25	15	31	40
57	25	15	32	40
58	25	15	33	40
59	25	15	34	40
60	25	100	35	100
61	25			
62	30			
63	20			
64	25			
65	25			
66	30			
67	30			
68	30			
69	30			
70	100			

Retirement Ages	Percent of Eligible Active Members Retiring			
	Police Patrol Hired After 1/1/2008 and Fire Hired After 7/1/2008	Years of Service	Police Patrol Hired Before 1/1/2008	Fire Hired Before 7/1/2008
50	30%	25	30%	30%
51	30	26	30	30
52	30	27	30	30
53	30	28	100	30
54	30	29	100	30
55	20	30	100	100
56	20			
57	20			
58	20			
59	20			
60	100			

The incidence of retirement for Police Patrol hired before January 1, 2008 and Fire hired before July 1, 2008 is assumed to be 100% when the participant reaches the benefit maximum. The incidence of retirement for Fire members is assumed to be 100% at age 62.

Percent of Eligible Active

**Members Retiring
(Early Retirement)**

<u>Retirement Ages</u>	<u>General & Court</u>	<u>Police & Fire</u>
50		1%
51		1
52		1
53		1
54		1
55		1
56		1
57	1%	1
58	1	1
59	1	1

Rates of Separation from Active Membership: The rates do not apply to members eligible for regular retirement and do not include separation on account of death or disability. This assumption measures the probabilities of members remaining in employment.

**% of Active Members
Separating within Next Year**

<u>Sample Ages</u>	<u>Years of Service</u>	<u>General</u>	<u>Court</u>	<u>Police</u>	<u>Fire</u>
ALL	0	11.00%	12.00%	6.00%	7.00%
	1	10.00	12.00	4.00	5.00
	2	8.00	10.00	3.50	3.50
	3	8.00	9.00	3.00	3.50
	4	7.00	9.00	2.50	3.00
20	5 & Over	6.00	6.00	3.00	3.00
25		5.50	5.50	3.00	3.00
30		4.40	4.40	2.50	2.50
35		3.90	3.90	1.50	1.50
40		3.40	3.40	0.70	0.70
45		3.00	3.00	0.50	0.50
50		2.00	2.00	0.50	0.50
55		1.40	1.40	0.50	0.50
60		1.40	1.40	0.50	0.50

The rates were first used for the June 30, 2013 valuation.

Rates of Disability: These rates represent the probabilities of active members becoming disabled.

<u>Sample Ages</u>	<u>Number of Disabilities Per 100 Eligible Members</u>
20	0.01
25	0.02
30	0.04
35	0.07
40	0.12
45	0.19
50	0.28
55	0.40
60	0.57

These rates were first used for the December 31, 1993 valuation.

Load for Administrative Expenses: Administrative expenses used in the contribution determination are based on the average dollar amount over the last 5 years (a rolling period), ending on the valuation date one year preceding the current valuation date. This flat dollar administrative expense load is allocated between the General group (closed), the Court group (closed), and the remaining two open groups based on the funding value of assets as of the administrative expense calculation date. The flat dollar portion of the administrative expense allocated to the two open groups is then converted to a percent of pay based on the combined projected fiscal year payroll for the open groups.

Pension Stipend Benefit Election: Ten percent of eligible active RHC plan members are assumed to elect cash payments (the pension stipend).

Miscellaneous and Technical Assumptions

June 30, 2018

Marriage Assumption:	100% of males and 100% of 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.
Pay Increase Timing:	Middle of (Fiscal) year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined using the age nearest birthday and the service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from experience, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and mortality decrements do not operate during the first 5 years of service. Disability also does not operate during retirement eligibility.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year.
Option Factors:	Factors for optional forms of payment (option factors) are based upon 7.5% interest of the 1994 GA Mortality Table setback 1 year with an 80% Male and 20% Female Unisex Blend.
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.
Normal Form of Benefit:	The normal form of benefit is a straight life annuity.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Loads:	The following loads were applied to active members for subsidized annuity withdrawal and special pays in final average compensation: General: 7.0% Court: 5.0% Police: 10.0% Fire: 13.0%
Forfeiture Assumption:	General members who terminate close to retirement were assumed to elect a deferred retirement while those terminating with less service were assumed to elect a refund of their contributions in lieu of deferred retirement benefits. All non-General members were assumed to elect a deferred retirement benefit.

Glossary

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." Under the actuarial cost method used the "AAL" differs somewhat from the value of future payments based on benefits earned as of the valuation date.

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

Actuarial Assumptions - Estimates of future plan experience with respect to rates of mortality, disability, retirement, investment income and salary increases. Decrement assumptions (rates of mortality, separation 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 appropriate 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 normal costs to be paid in the future and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent - Benefits whose actuarial present values are equal.

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.

Amortization - Paying of an interest-bearing liability by means of periodic contributions of interest and principal, as opposed to a lump sum payment.

Experience Gain (Loss) - A measure of the difference between actual experience and experience anticipated by a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost - The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." An amortization payment toward the unfunded actuarial accrued liability is in addition to the normal cost.

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.

SECTION E

FINANCIAL DISCLOSURES

Retirement System

Schedule of Pension Plan Funding Progress

Actuarial Valuation Date	Actuarial Value of Pension Assets (a)	Pension Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) – (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) – (a)] / (c)
06/30/09#	\$ 123,309,158	\$ 140,261,150	\$ 16,951,992	87.9 %	\$24,904,782	68.1 %
6/30/2010	122,384,733	149,204,540	26,819,807	82.0	21,749,242	123.3
06/30/11	126,993,894	152,271,739	25,277,845	83.4	21,236,510	119.0
06/30/12	127,759,371	157,810,232	30,050,861	81.0	20,415,113	147.2
06/30/13@#	135,447,393	163,515,916	28,068,523	82.8	19,898,614	141.1
06/30/14	142,635,461	168,555,933	25,920,472	84.6	19,549,678	132.6
06/30/15@#	148,299,323	171,958,385	23,659,062	86.2	20,047,647	118.0
06/30/16	150,257,018	177,254,145	26,997,127	84.8	20,046,105	134.7
06/30/17#	155,325,541	185,538,016	30,212,475	83.7	20,089,578	150.4
6/30/2018@	159,892,090	192,830,969	32,938,879	82.9	19,941,526	165.2

@ Plan provision change

Certain assumptions or methods revised.

Actuarial Cost Method

Individual Entry Age

Asset Valuation Method

Market Value with 5-Year
Smoothing of Gains and Losses

Principal Actuarial Assumptions
(last revised for the 12/31/13 valuation):

- Net Investment Return	7.40%
- Projected Salary Increases	
General and Court	4.5% to 7.5%
Police	4.5% to 23.5%
Fire	4.5% to 20.5%
- Post-Retirement Cost of Living Adjustments	None



November 15, 2018

The Retirement Board
City of Farmington Hills
Employees' Retirement System
31555 Eleven Mile Road
Farmington Hills, Michigan 48336-1165

Attention: Retirement Board

Enclosed is one copy of the annual actuarial valuation of the City of Farmington Hills Employees' Retirement System.

We will be happy to meet with the Retirement Board to discuss the results of the valuation.

Sincerely,

A handwritten signature in black ink that reads "Louise Gates". The signature is written in a cursive, flowing style.

Louise M. Gates, ASA, FCA, MAAA

Enclosures