

# City of Southgate Policemen and Firemen Retirement System

63rd Actuarial Valuation Report  
as of June 30, 2017



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February 19, 2018

Retirement Board  
City of Southgate Policemen and Firemen  
Retirement System  
Southgate, Michigan

**Re: City of Southgate Policemen and Firemen Retirement System Annual Actuarial Valuation  
as of June 30, 2017**

Dear Board Members:

The results of the June 30, 2017 Annual Actuarial Valuation of the City of Southgate Policemen and Firemen Retirement System are presented in this report.

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

The purposes of the valuation are to measure the System's funding progress, and to determine the employer contribution rate for the fiscal year ending June 30, 2019. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The findings in this report are based on data and other information through June 30, 2017. 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

The valuation was based upon information furnished by the Plan Administrator and City concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Plan Administrator and City.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed. The computed contribution rate shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section C of this report. This report includes risk metrics on page A-9 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the City of Southgate Policemen and Firemen Retirement System 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.

Mark Buis and Rebecca L. Stouffer are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

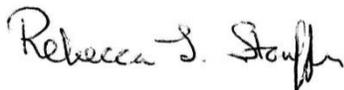
The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation and Report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,



Mark Buis, FSA, FCA, EA, MAAA



Rebecca L. Stouffer, ASA, MAAA

MB/RLS:bd

## **SECTION A**

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### **VALUATION RESULTS**

## Funding Objective

The funding objective of the Retirement System is to establish and receive contributions, expressed as percents of active member payroll, which will remain reasonably stable from year-to-year and will fund pensions over the working lifetimes of participants.

## Contribution Rates

The Retirement System is supported by member contributions, City contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

- (1) Cover the actuarial present value of benefits allocated to the current year by the actuarial cost method described in Section C (the normal cost); and
- (2) Finance over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

**Computed contribution rates** for the fiscal year beginning July 1, 2018 are shown on page A-2.

## City's Computed Contributions

Contributions for	% of Covered Payroll	
	For the Fiscal Year Beginning July 1,	
	2018	2017
Normal Cost of Benefits:		
Age and service	17.72 %	17.94 %
Death before retirement	0.47 %	0.48 %
Disability	1.14 %	1.18 %
Future refunds of member contributions	0.28 %	0.28 %
Total	19.61 %	19.88 %
Members' Contributions	6.62 %	6.64 %
City's Normal Cost	12.99 %	13.24 %
Unfunded Actuarial Accrued Liabilities (UAAL)	68.12 %	65.13 %
<b>Total City Contribution# - %</b>	<b>81.11 %</b>	<b>78.37 %</b>
- \$	<b>\$4,206,242</b>	<b>\$3,983,767</b>

# All fiscal calculations are based on the valuation payroll including increases in payroll at the assumed rate of wage inflation. The dollar amount is adjusted for the lag in time between the valuation date and payment date.

**Actual employer contributions** for the fiscal year ending June 30, 2017 were reported to be \$3,244,840.

The unfunded actuarial accrued liabilities were amortized as a level percent of member payroll. For the fiscal year beginning July 1, 2018, a portion of the UAAL was amortized over a period of 3 years and the remaining UAAL was amortized over a period of 9 years.

Comparative contribution rates for prior fiscal years are shown on page A-10.

## Determination of Unfunded Actuarial Accrued Liability

	June 30,	
	2017	2016
A. Accrued Liability		
1. For retirees and beneficiaries	\$52,144,215	\$52,406,109
2. For vested terminated members	904,498	840,786
3. For present active members		
a. Value of expected future benefit payments	28,789,148	27,948,420
b. Value of future normal costs	9,442,117	9,917,339
c. Active member accrued liability: (a) - (b)	19,347,031	18,031,081
4. Total accrued liability	72,395,744	71,277,976
B. Present Assets (Funding Value)*	44,487,598	43,576,823
C. Unfunded Actuarial Accrued Liability: (A.4) - (B)	27,908,146	27,701,153
D. Funding Ratio: (B) / (A.4)	61.5%	61.1%
E. Funding Ratio: Market Value Basis	59.3%	55.0%

\* Net of Excess Earnings Reserve of \$356,152 for June 30, 2017, and \$390,754 for June 30, 2016.

## Development of Funding Value of Assets

Year Ended June 30:	2014	2015	2016	2017	2018	2019	2020
A. Funding Value Beginning of Year	\$41,888,768	\$44,251,466	\$44,321,849	\$43,967,577			
B. Market Value End of Year	45,921,357	43,130,491	39,572,048	43,250,895			
C. Market Value Beginning of Year	41,066,879	45,921,357	43,130,491	39,572,048			
D. Non-Investment Net Cash Flow	(1,558,488)	(2,252,447)	(2,339,438)	(1,556,454)			
E. Investment Income							
E1. Market Total: B - C - D	6,412,966	(538,419)	(1,219,005)	5,235,301			
E2. Assumed Rate of Investment Return	7.50%	7.50%	7.50%	7.25%			
E3. Amount for Immediate Recognition	3,083,214	3,234,393	3,236,410	3,131,228			
E4. Amount for Phased-In Recognition: E1-E3	3,329,752	(3,772,812)	(4,455,415)	2,104,073			
F. Phased-In Recognition of Investment Income							
F1. Current Year: 0.25 x E4	\$832,438	(943,203)	(1,113,854)	526,018			
F2. First Prior Year	(26,626)	832,438	(943,203)	(1,113,854)	\$ 526,018		
F3. Second Prior Year	(774,174)	(26,626)	832,438	(943,203)	(1,113,854)	\$ 526,018	
F4. Third Prior Year	806,334	(774,172)	(26,625)	832,438	(943,203)	(1,113,853)	\$526,019
F5. Total Recognized Investment Gain	837,972	(911,563)	(1,251,244)	(698,601)	(1,531,039)	(587,835)	526,019
G. Funding Value End of Year							
G1. Preliminary Funding Value End of Year: (A+D+E3+F5)	44,251,466	44,321,849	43,967,577	44,843,750			
G2. Upper Corridor Limit: 120% x B	55,105,628	51,756,589	47,486,458	51,901,074			
G3. Lower Corridor Limit: 80% x B	36,737,086	34,504,393	31,657,638	34,600,716			
G4. Adjustment to Funding Value	0	0	0	0			
G5. Funding Value End of Year	44,251,466	44,321,849	43,967,577	44,843,750			
H. Difference between Market & Funding Value: B-G5	1,669,891	(1,191,358)	(4,395,529)	(1,592,855)			
I. Recognized Rate of Return	9.5 %	5.4 %	4.6%	5.6%			
J. Market Rate of Return	15.9%	(1.2)%	(2.9)%	13.5 %			
K. Ratio of Funding Value to Market Value	96.4 %	102.8 %	111.1 %	103.7 %			

The Funding Value of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. The Funding Value of Assets is unbiased with respect to Market Value. At any time it may be either greater or less than Market Value. If actual and assumed rates of retirement income are exactly equal for 3 consecutive years, the Funding Value will become equal to Market Value.

## Derivation of Experience Gain/(Loss) Years Ended June 30, 2017 and 2016

Actual experience will never (except by coincidence) coincide exactly with assumed experience. Gains and losses often 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:

	2016-2017	2015-2016
(1) UAAL* at start of year	\$ 27,701,153	\$ 23,571,981
(2) Employer normal cost from last valuation	650,267	601,326
(3) Actual employer contributions	3,244,840	2,580,266
(4) Interest accrual: [ ((1) + 1/2[(2) - (3)]) * 7.25% ]	1,914,280	1,693,688
(5) Expected UAAL before changes: (1)+(2)-(3)+(4)	27,020,860	23,286,729
(6) Effect of Assumption Changes	0	3,825,303
(7) Excess Earnings transferred to Excess Earnings Reserve Fund	0	0
(8) Expected UAAL after changes: (5)+(6)+(7)	27,020,860	27,112,032
(9) Actual UAAL at end of year	27,908,146	27,701,153
(10) Gain/(loss): (8)-(9)	(887,286)	(589,121)
(11) Gain/(loss) as percent of actuarial accrued liabilities at start of year (\$71,277,976)	(1.2)%	(0.9)%

\* *Unfunded Actuarial Accrued Liabilities.*

# Summary Statement of System Resources and Obligations for the Years Ending June 30, 2017 and 2016

## Present Resources and Expected Future Resources

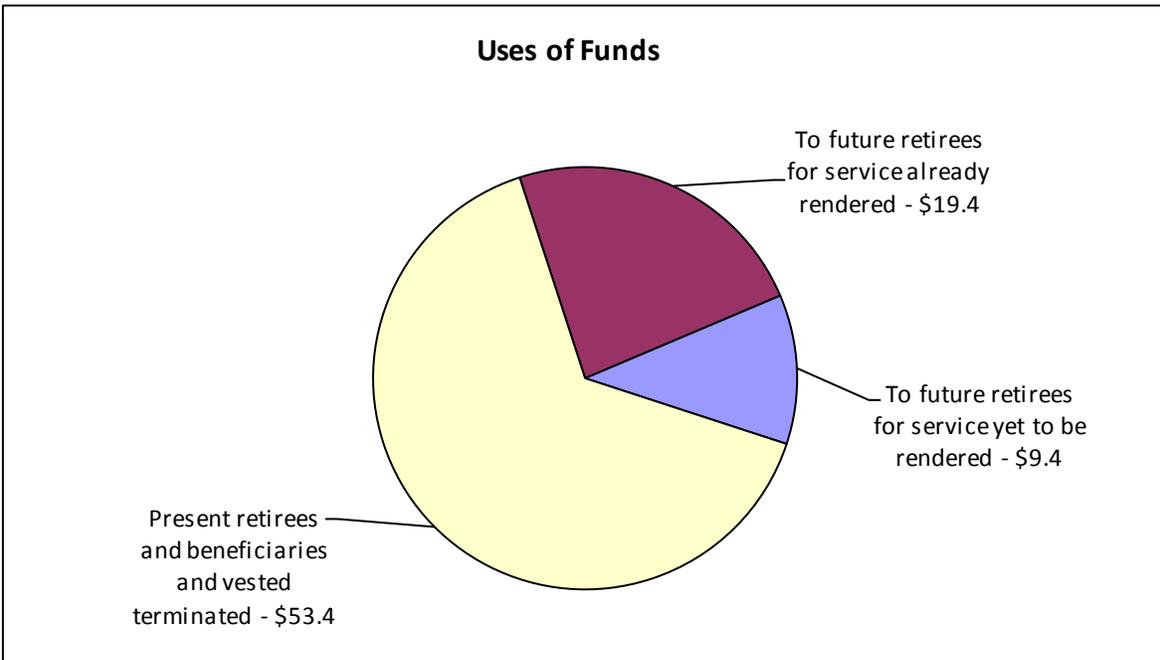
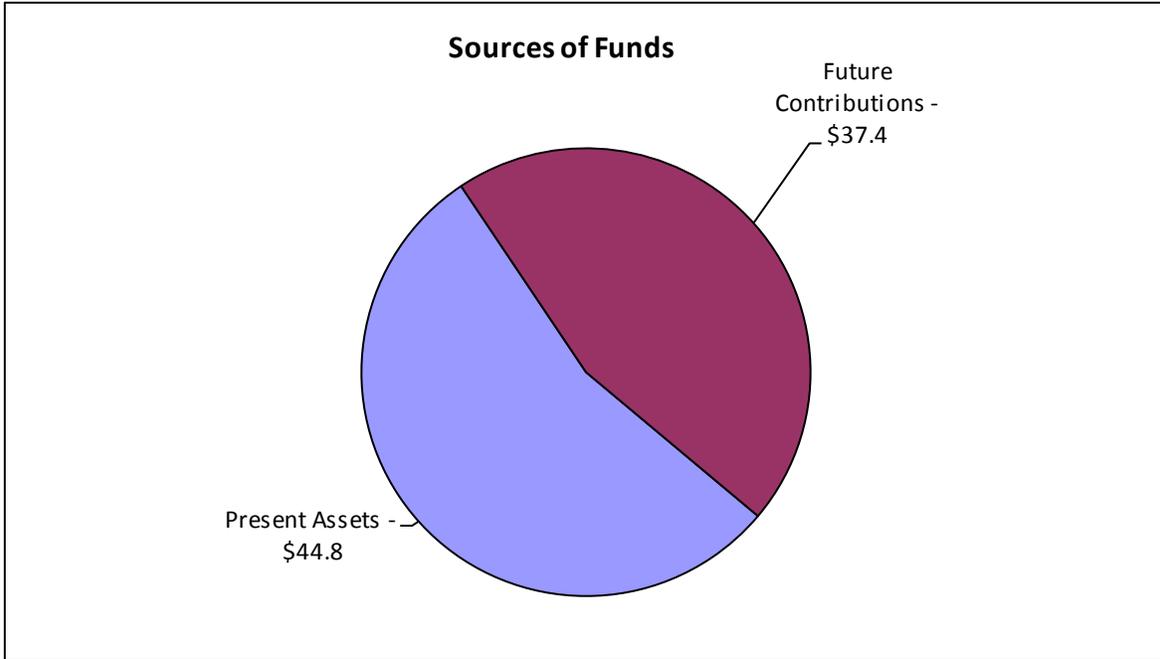
	2017	2016
A. Present valuation assets		
1. Net assets from System financial statements	\$43,250,895	\$39,572,048
2. Market value adjustment	1,592,855	4,395,529
3. Valuation assets	44,843,750	43,967,577
B. Actuarial present value of expected future employer contributions		
1. For normal costs	6,017,697	6,381,624
2. For unfunded actuarial accrued liability	27,908,146	27,701,153
3. Total	33,925,843	34,082,777
C. Actuarial present value of expected future member contributions	3,424,420	3,535,715
D. Total present and expected future resources	\$82,194,013	\$81,586,069

## Actuarial Present Value of Expected Future Benefit Payments

	2017	2016
A. To retirees and beneficiaries #	\$52,500,367	\$52,796,863
B. To vested terminated members	904,498	840,786
C. To present active members		
1. Allocated to service rendered prior to valuation date - actuarial accrued liability	19,347,031	18,031,081
2. Allocated to service likely to be rendered after valuation date	9,442,117	9,917,339
3. Total	28,789,148	27,948,420
D. Total actuarial present value of expected future pension payments	\$82,194,013	\$81,586,069

# Includes excess earnings reserve fund.

# Financing \$82.2 Million of Benefit Promises June 30, 2017



## Actuarial Accrued Liabilities & Assets Comparative Statement

Valuation Date!	Valuation Assets	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liabilities (UAAL)	Valuation Payroll	Ratio of Valuation Assets To AAL	Amortization Years	Ratio of Valuation Assets To Valuation Payroll	Ratio of AAL To Valuation Payroll	Ratio of UAAL To Valuation Payroll
06-30-98#*	\$ 45,417,314	\$ 37,698,954	\$ (7,718,360)	\$ 4,245,003	120.5 %		1,069.9 %	888.1 %	-
06-30-99	50,387,276	40,236,906	(10,150,370)	4,385,431	125.2 %		1,149.0 %	917.5 %	-
06-30-00#	54,290,845	43,579,816	(10,711,029)	4,848,076	124.6 %		1,119.8 %	898.9 %	-
06-30-01	56,377,876	43,502,852	(12,875,024)	4,692,492	129.6 %		1,201.5 %	927.1 %	-
06-30-02	55,156,131	47,533,958	(7,622,173)	4,898,127	116.0 %		1,126.1 %	970.5 %	-
06-30-03#	50,720,650	50,848,534	127,884	4,490,451	99.7 %		1,129.5 %	1,132.4 %	2.8 %
06-30-04*	47,582,175	52,671,475	5,089,300	5,065,923	90.3 %		939.3 %	1,039.7 %	100.5 %
06-30-05	45,763,955	53,877,816	8,113,861	5,239,288	84.9 %		873.5 %	1,028.3 %	154.9 %
06-30-06	46,566,532	56,806,766	10,240,234	5,281,801	82.0 %	20	881.6 %	1,075.5 %	193.9 %
06-30-07	49,164,698	59,119,680	9,954,982	5,438,968	83.2 %	19	903.9 %	1,087.0 %	183.0 %
06-30-08#	50,436,365	57,187,103	6,750,738	5,759,174	88.2 %	18	875.8 %	993.0 %	117.2 %
06-30-09#	45,271,102	58,953,581	13,682,479	5,847,595	76.8 %	17	774.2 %	1,008.2 %	234.0 %
06-30-10	43,827,980	61,186,413	17,358,433	5,532,619	71.6 %	16	792.2 %	1,105.9 %	313.7 %
06-30-11	42,616,916	63,999,867	21,382,951	4,922,456	66.6 %	15	865.8 %	1,300.2 %	434.4 %
06-30-12	40,675,521	64,233,512	23,557,991	4,889,791	63.3 %	14	831.9 %	1,313.6 %	481.8 %
06-30-13	41,888,768	65,718,329	23,829,561	4,966,288	63.7 %	13	843.5 %	1,323.3 %	479.8 %
06-30-14	44,251,466	66,847,581	22,596,115	5,047,949	66.2 %	12	876.6 %	1,324.3 %	447.6 %
06-30-15#	44,321,849	67,893,830	23,571,981	4,633,108	65.3 %	11, 5	956.6 %	1,465.4 %	508.8 %
06-30-16*	43,967,577	71,668,730	27,701,153	4,745,297	61.3 %	10, 4	926.6 %	1,510.3 %	583.8 %
06-30-17	44,843,750	72,751,896	27,908,146	4,841,046	61.6 %	9, 3	926.3 %	1,502.8 %	576.5 %

- \* Actuarial assumptions revised.
- # Retirement System amended.
- ! Includes excess earnings reserve.

**The Ratio of Valuation Assets to AAL** is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

Amortization years indicate the years remaining for financing the UAAL. Historical information is not available for years prior to June 30, 2006.

The ratios of assets and AAL to valuation payroll gives an indication of both maturity and volatility. Many systems have ratios between 5 and 7. When ratios are above this range, there may be more volatility in the year-to-year contribution level as a % of pay. For systems that are closed to new hires, it is expected that these ratios will grow as payroll declines.

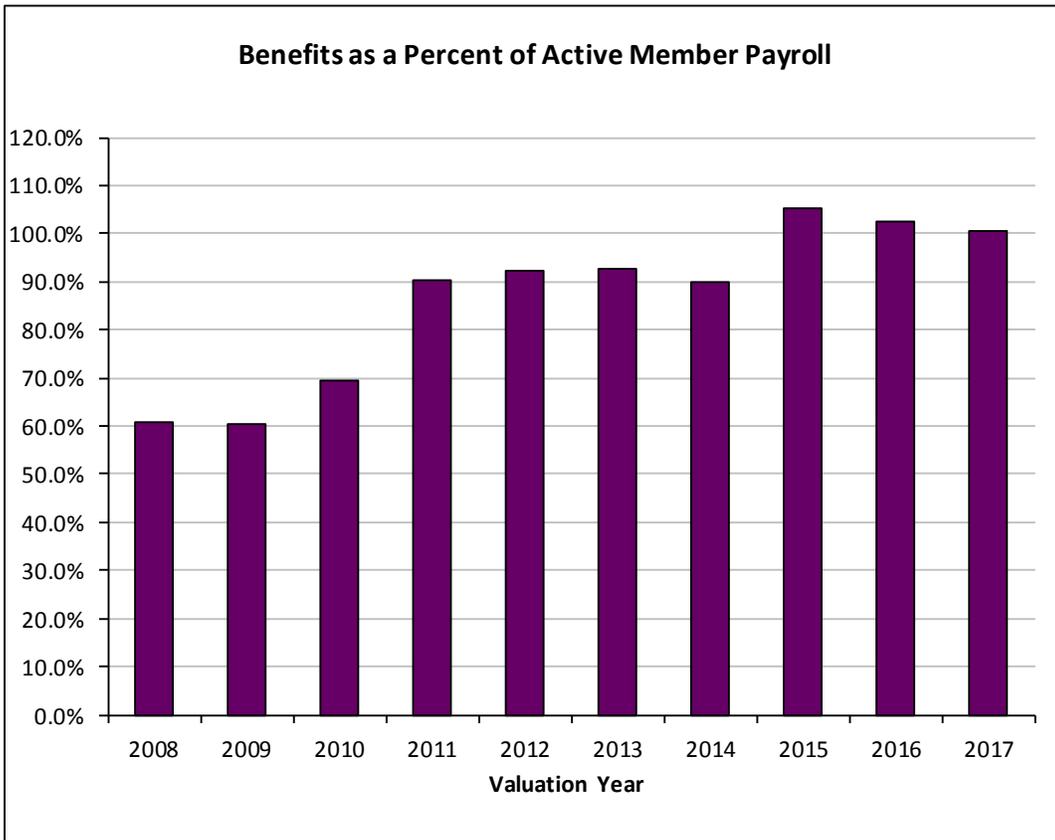
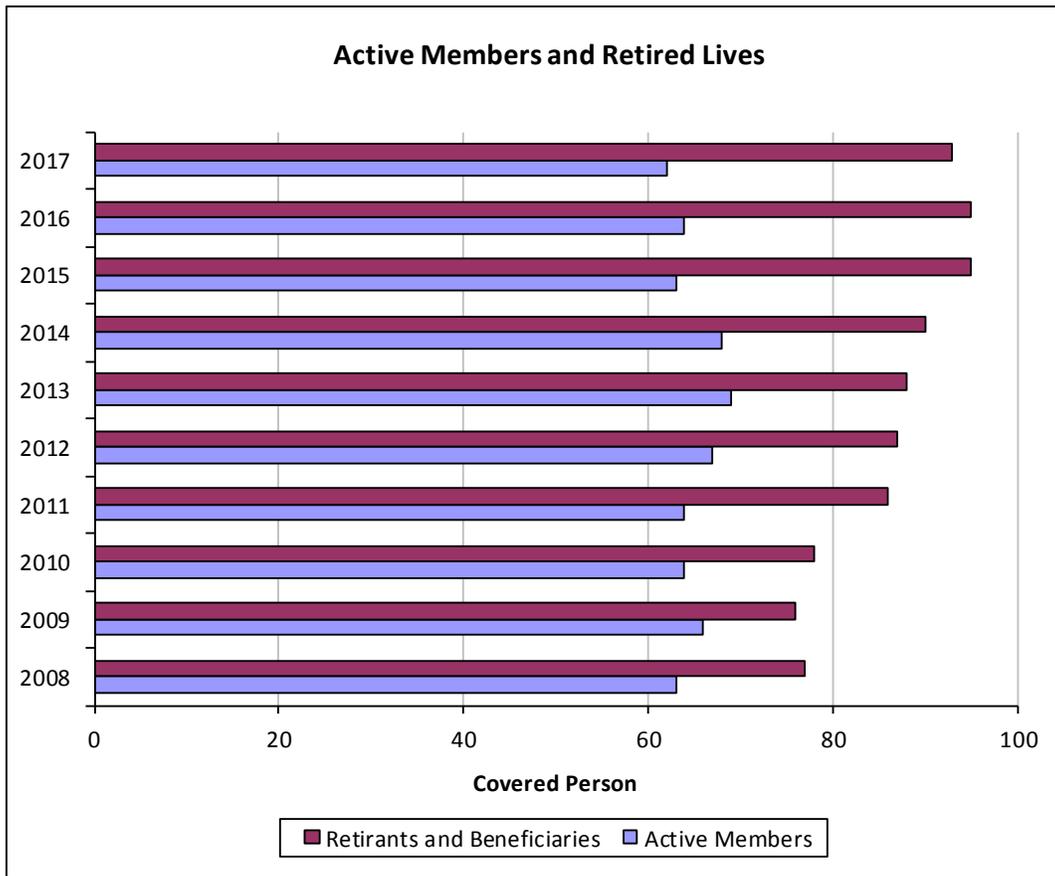
The ratio of UAAL to valuation payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 3 or 4 may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

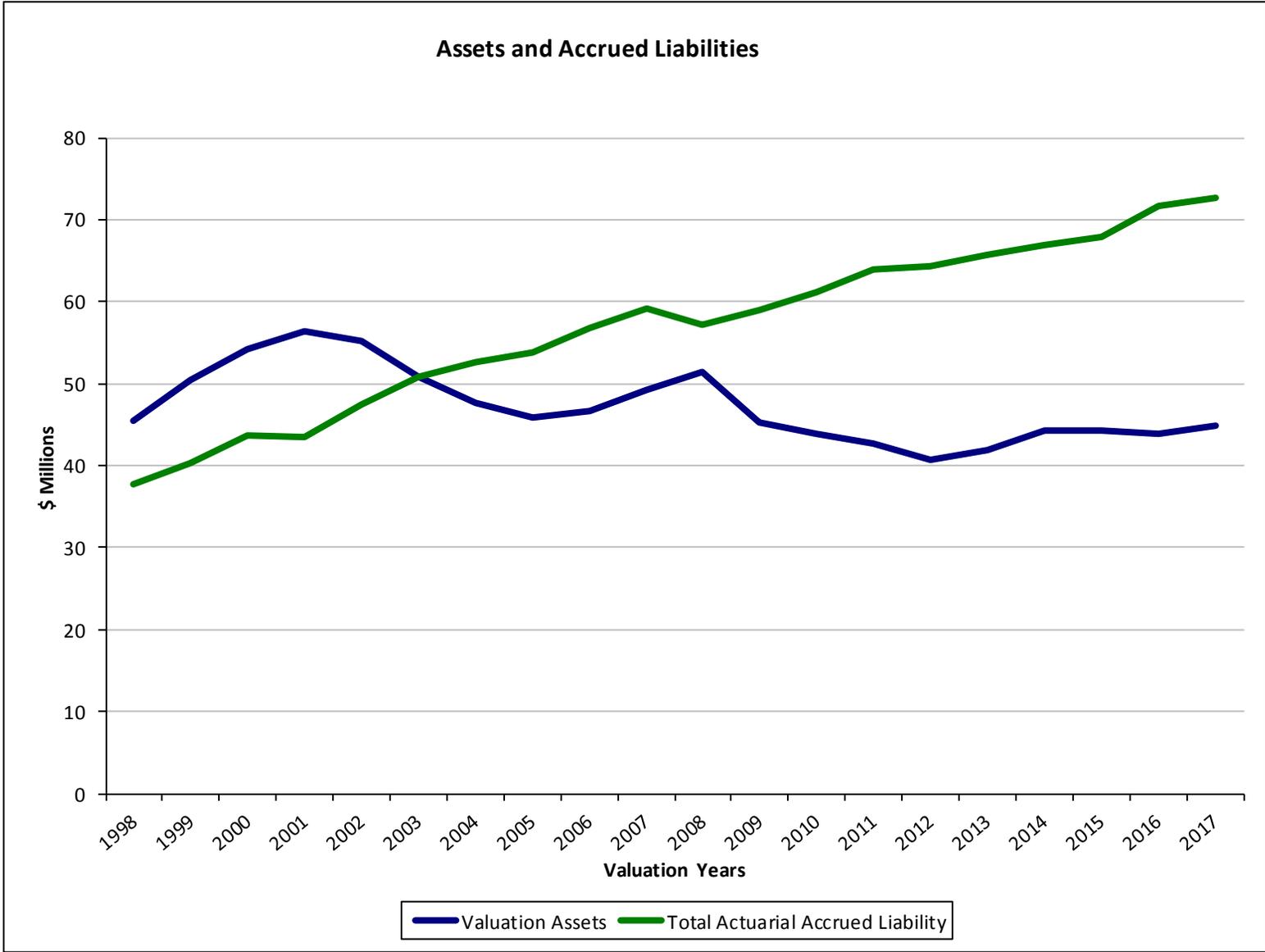
## Computed Employer Contributions Comparative Statement

Valuation Date	Active Members				Retirees & Beneficiaries				Employer Contributions as Payroll Percents		
	No.	Valuation Payroll			No	Active Per Retired	Annual Pensions		Employer Normal Cost	UAAL	Total
		Total	Average	% Incr.			\$	% of Payroll			
06-30-98#*	69	\$4,245,003	\$61,522	1.5 %	50	1.4	\$1,627,356	38.3 %	23.2 %	(16.9)%	6.2 %
06-30-99	68	4,385,431	64,492	4.8 %	55	1.2	1,916,336	43.7 %	22.7 %	(21.5)%	1.2 %
06-30-00#	69	4,848,076	70,262	8.9 %	57	1.2	2,032,864	41.9 %	22.5 %	(20.6)%	1.9 %
06-30-01	71	4,692,492	66,091	(5.9)%	58	1.2	2,090,714	44.6 %	22.3 %	(22.3)%	(0.0)%
06-30-02	71	4,898,127	68,988	4.4 %	60	1.2	2,210,668	45.1 %	22.0 %	(14.5)%	7.5 %
06-30-03#	64	4,490,451	70,163	1.7 %	73	0.9	3,164,793	70.5 %	21.7 %	0.3 %	22.0 %
06-30-04*	67	5,065,923	75,611	7.8 %	75	0.9	3,170,325	62.6 %	19.1 %	10.1 %	29.2 %
06-30-05	67	5,239,288	78,198	3.4 %	73	0.9	3,134,950	59.8 %	19.1 %	14.3 %	33.4 %
06-30-06	64	5,281,801	82,528	5.5 %	75	0.9	3,337,483	63.2 %	19.4 %	11.8 %	31.2 %
06-30-07	63	5,438,968	86,333	4.6 %	76	0.8	3,433,920	63.1 %	19.4 %	11.7 %	31.1 %
06-30-08#	63	5,759,174	91,415	5.9 %	77	0.8	3,471,224	60.3 %	12.8 %	7.1 %	19.9 %
06-30-09#	66	5,847,595	88,600	(3.1)%	76	0.9	3,521,322	60.2 %	13.2 %	16.9 %	30.1 %
06-30-10	64	5,532,619	86,447	(2.4)%	78	0.8	3,844,141	69.5 %	13.2 %	23.2 %	36.4 %
06-30-11	64	4,922,456	76,913	(11.0)%	86	0.7	4,445,242	90.3 %	13.0 %	33.8 %	46.8 %
06-30-12	67	4,889,791	72,982	(5.1)%	87	0.8	4,503,892	92.1 %	13.6 %	39.0 %	52.6 %
06-30-13	69	4,966,288	71,975	(1.4)%	88	0.8	4,594,702	92.5 %	13.7 %	40.8 %	54.5 %
06-30-14	68	5,047,949	74,235	3.1 %	90	0.8	4,539,096	89.9 %	14.2 %	40.3 %	54.5 %
06-30-15#	63	4,633,108	73,541	(0.9)%	95	0.7	4,878,836	105.3 %	12.4 %	50.0 %	62.4 %
06-30-16*	64	4,745,297	74,145	0.8 %	95	0.7	4,861,054	102.4 %	13.2 %	65.1 %	78.3 %
06-30-17	62	4,841,046	78,081	5.3 %	93	0.7	4,862,301	100.4 %	13.0 %	68.1 %	81.1 %

\* Actuarial assumptions revised.

# Retirement System amended.





## Comments, Certification, and Other Observations

**Comment A:** The contribution increased from \$3,983,767 last year to \$4,206,242 this year.

**Comment B:** System experience for the year ended June 30, 2017 was less favorable than assumed, resulting in an overall loss of \$887,286. The experience loss was primarily due to unfavorable investment performance.

**Comment C:** An excess earnings reserve fund was established in 1996. The reserve balance as of June 30, 2017 is \$356,152. See page Appendix-2 for the development of the reserve balance.

A portion of the excess earnings reserve has been used in prior years to provide ad-hoc post-retirement increases. The ad-hoc increases have not been explicitly included when calculating contribution requirements to the Retirement System.

**Comment D:** As of the valuation date, the Unfunded Actuarial Accrued Liability (UAAL) is \$27.9 million, and the funded ratio is 61.5% (59.3% on a market value basis). At the time of the last valuation, the funded ratio was 61.1%.

The retired lives are less than fully funded on a market value basis. It is most important that the Plan receive contributions at least equal to the rates shown in this report.

**Comment E:** The June 30, 2017 actuarial present value of retirement allowances (including the excess earnings reserve) is greater than the balance in the Reserve for Retired Benefit Payments. Past practice has been to maintain an exact balance between assets and liabilities for current retired lives. ***Therefore to the extent possible, we recommend a transfer in the amount of \$14,467,209 from the Reserve for Employer's Contributions to the Reserve for Retired Benefit Payments.*** The transfer was assumed to have been made as of June 30, 2017 for purposes of this valuation.

**Michigan Public Act 202:** Created new reporting and other requirements for local units of government. The Retirement Board may be asked to assist the City in its efforts to comply with these new requirements. We recommend the Board discuss with counsel the potential need for an update to the Actuarial Funding Policy as a result of this legislation.

**Looking Ahead:** Due to the asset smoothing method only a portion of the current year asset gain was recognized, and portions of prior year's gains and losses remain to be recognized. If the Market Value of Assets were used (instead of smoothed value), the employer contribution would have been approximately \$4,500,000 (instead of \$4,206,242) and the funded status would have been about 59.3% (instead of 61.5%).

**Certification:** We certify that the valuation is complete and accurate and was made in accordance with generally recognized actuarial methods. The actuarial assumptions summarized in Section C are in aggregate a reasonable representation of the past and anticipated future experience of the System.

# Comments, Certification, and Other Observations

## OTHER OBSERVATIONS:

### 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 7.25% on the actuarial value of assets), it is expected that:

- 1) employer normal cost amounts as a percentage of payroll will remain approximately level year to year;
- 2) the unfunded actuarial accrued liability will be fully amortized after 9 years; and
- 3) the funded status of the plan will increase gradually towards a 100% funded ratio.

### Limitations of Funded Status Measurements

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

- 1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.
- 2) The measurement is inappropriate for assessing the need for or the amount of future employer contributions.
- 3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.
- 4) The funding level of the plan on a Market Value basis as of June 30, 2017 is shown on page A-3.

## **SECTION B**

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### **VALUATION DATA**

# Brief Summary of Act 345 Benefit Provisions as of June 30, 2017

## Service Retirement

**Eligibility:** All groups: Age 50 with 25 or more years of service or age 60 regardless of service.

**Amount:** The benefit amounts attributable to service retirements and the conditions under which such benefits may be paid are described in tabular form on page B-3.

Eligibility	Amount
<b>Deferred Retirement</b>	
10 or more years of service.	Computed as service retirement but based upon service, FAC and benefit in effect at termination. Benefit begins at date retirement would have occurred had member remained in employment.
<b>Death After Retirement Survivor's Pension</b>	
Payable to a surviving spouse, if any, upon the death of a retired member who was receiving a straight life pension which was effective July 1, 1975 or later.	Spouse's pension equals 60% of the pension retiree was receiving.
<b>Non-Duty Death-In-Service Survivor's Pension</b>	
Payable to a surviving spouse, if any, upon the death of a member with 10 or more years of service.	Accrued straight life pension actuarially reduced in accordance with an Option I election.
<b>Duty Death-In-Service Survivor's Pension</b>	
Payable upon the expiration of worker's compensation to the survivors of a member who died in the line of duty.	Same amount that was paid by worker's compensation.
<b>Non-Duty Disability</b>	
Payable upon the total and permanent disability of a member with 5 or more years of service.	To Age 55: 1.5% of FAC times years of service. At Age 55: Same as service retirement pension.
<b>Duty Disability</b>	
Payable upon the total and permanent disability of a member in the line of duty.	To Age 55: 50% of FAC. At Age 55: Same as service retirement pension with service credit from date of disability to age 55.
<b>Member Contributions</b>	
Police Chief, Fire Chief, and Public Safety Director	10.0% of covered compensation.
All Others	6.5% of covered compensation.
<b>FAC Period</b>	
All	Average of the highest 3 years of annual compensation during the 10 years immediately preceding retirement.

# Brief Summary of Act 345 Benefit Provisions as of June 30, 2017

## Includable Compensation

### IAFF Local 1307

- FAC for Command Officers promoted to command on or before 7/1/2006 shall be based upon all compensation received during the employees FAC period, to include any payment received for sick, vacation, or bonus vacation days.
- For employees promoted to command after 7/1/2006, ½ sick with a maximum cap of 45 days.
- For employees hired after 1/1/2008 only base wage, longevity pay, and unused vacation (capped at 5 days) shall be factored into FAC.

### Police (COA)

- FAC for all employees shall be based upon all compensation received during the employees FAC period, to include any payment received for sick, vacation, or bonus vacation days. In addition, the dollar value of any compensatory time earned during the officer's FAC period shall be factored in.
- For employees promoted prior to 7/1/2006 the FAC shall include all of the items above up to a maximum of 1600 sick hours.
- For employees hired after 7/1/2007 FAC will not include any sick time payout.

### Police Patrol

- For employees hired after 1/1/1981, FAC shall be based upon base wage, overtime pay, longevity pay, holiday pay, accumulated and accrued unused vacation days at the time of retirement, officer training bonus, gun allowance and cleaning and clothing allowance, and one half of accumulated sick leave, to a maximum of 800 hours.
- For employees hired after 7/1/2008, FAC will only include base wage, longevity pay, and unused vacation time (capped at 120 hours).

## Brief Summary of Act 345 Benefit Provisions as of June 30, 2017

Group	Benefit Formula					Maximum Annual Benefit After Annuity Withdrawal*	Comment
	Multiplier x Service		Multiplier x Service				
<b>IAFF Local 1307</b>							
Tier 1: Hired before 7/1/08, retired after 7/1/15	2.69%	first 25	+	1.00%	over 25	\$80,000	1
Tier 2: Hired on or after 7/1/08, retired after 7/1/15	2.69%	first 25	+	1.00%	over 25	\$70,000	1
<b>Police (COA)</b>							
Tier 1: Hired before 7/1/08, retired after 7/1/15	2.69%	first 25	+	1.00%	over 25	\$80,000	2
Tier 2: Hired on or after 7/1/08, retired after 7/1/15	2.69%	first 25	+	1.00%	over 25	\$70,000	2
<b>Police Patrol</b>							
Tier 1: Hired before 7/1/08, retired after 7/1/15	2.69%	first 25	+	1.00%	over 25	\$80,000	-
Tier 2: Hired on or after 7/1/08, retired after 7/1/15	2.69%	first 25	+	1.00%	over 25	\$70,000	-
<b>Current Public Safety Director</b>	2.69%	first 25	+	1.00%	over 25	\$89,447	-

<sup>1</sup> Members promoted to command positions on or after 7/1/06 will be provided the same pension calculations and payout at retirement as they were provided as non-command officers.

<sup>2</sup> Members promoted to COA on or after 7/1/06 will maintain their current benefits unless the COA agreement provides less.

\* Payable as straight life annuity.

## Retirees and Beneficiaries Added to and Removed from Rolls Comparative Statement

Year Ended	Added to Rolls		Removed from Rolls		Rolls End of Year		Pensions as a % of Member Payroll	Average Pension	Present Value of Pensions <sup>+</sup>
	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions			
06-30-93	2	\$ 87,928			39	\$ 1,100,536	30.4%	\$28,219	\$ 12,449,717
06-30-94	6	204,491	1	\$ 28,571	44	1,276,457	37.2%	29,010	14,587,272
06-30-95	5	228,718			49	1,505,175	44.2%	30,718	16,924,255
06-30-96	1	40,014			50	1,545,190	39.9%	30,904	17,223,531
06-30-97	2	107,637			52	1,652,827	41.3%	31,785	18,307,697
06-30-98@			2	25,471	50	1,627,356	38.3%	32,547	17,771,957
06-30-99	5	288,980			55	1,916,336	43.7%	34,842	20,947,459
06-30-00	2	116,528			57	2,032,864	41.9%	35,664	22,006,686
06-30-01	2	75,688	1	17,838	58	2,090,714	44.6%	36,047	22,451,152
06-30-02#	2	119,954			60	2,210,668	45.1%	36,844	23,501,605
06-30-03	15	1,022,154	2	68,029	73	3,164,793	70.5%	43,353	34,597,105
06-30-04@	1	5,531			74	3,170,325	62.6%	42,842	34,497,627
06-30-05	2	34,630	3	70,005	73	3,134,950	59.8%	42,945	33,702,098
06-30-06	5	257,163	3	54,630	75	3,337,483	63.2%	44,500	35,632,439
06-30-07	3	158,889	2	62,452	76	3,433,920	63.1%	45,183	36,359,122
06-30-08@	1	42,164		4,860	77	3,471,224	60.3%	45,081	36,296,873
06-30-09@	2	104,196	3	54,098	76	3,521,322	60.2%	46,333	36,639,620
06-30-10	6	423,407	4	100,588	78	3,844,141	69.5%	49,284	40,118,035
06-30-11^	10	662,697	2	61,596	86	4,445,242	90.3%	51,689	47,597,576
06-30-12	2	123,636	1	64,986	87	4,503,892	92.1%	51,769	47,475,689
06-30-13	2	112,805	1	21,995	88	4,594,702	92.5%	52,213	47,905,503
06-30-14	5	125,168	4	180,774	89	4,539,096	89.9%	51,001	46,866,286
06-30-15@	9	480,526	3	140,786	95	4,878,836	105.3%	51,356	51,295,005
06-30-16@	2	101,081	2	118,863	95	4,861,054	102.4%	51,169	52,406,109
06-30-17	1	102,311	3	101,064	93	4,862,301	100.4%	52,283	52,144,215

@ Revised actuarial assumptions and/or benefit provisions.

+ Excludes excess earnings reserves, 6-30-97 and later.

# Doesn't include window retirees.

^ Includes members electing to enter 1 year Trust.

## Retirees and Beneficiaries as of June 30, 2017 Tabulated by Type of Pension Being Paid

Type of Pension Being Paid	No.	Annual Pensions
<b>Age and Service Pensions</b>		
Regular Pension - terminating at death of retiree*	19	\$ 751,089
Regular Pension - automatic 60% spouse benefit	54	3,636,122
Survivor Benefit	8	192,477
<b>Total Age and Service Pensions</b>	<b>81</b>	<b>4,579,688</b>
<b>Casualty Pensions</b>		
Duty Disability Pensions	10	251,938
Duty Death	1	22,932
Non-Duty Death	1	7,743
<b>Total Casualty Pensions</b>	<b>12</b>	<b>282,613</b>
<b>Total Pensions Being Paid</b>	<b>93</b>	<b>\$4,862,301</b>

\*Includes EDRO Alternate Payees.

On the valuation date, there are three vested former members, ages 47, 48, and 48, with total estimated annual benefits of \$105,408.

## Retirees and Beneficiaries June 30, 2017 Tabulated by Attained Age

Attained Age	No.	Annual Pensions
38	1	\$ 7,743
47	1	31,243
49	1	36,337
50	1	74,444
51	2	95,861
52	2	165,805
53	2	166,144
54	1	89,447
55	3	143,618
56	2	94,901
57	2	107,556
58	5	463,338
59	2	149,350
60	4	304,147
61	3	118,903
63	3	258,325
65	4	233,057
66	7	345,784
67	5	250,218
69	4	179,332
70	4	186,362
71	2	140,910
72	2	108,726
73	4	144,404
74	6	246,334
75	2	80,651
76	4	129,754
77	1	48,838
78	6	217,501
79	1	48,316
80	1	56,495
83	1	36,194
87	2	66,746
88	1	23,398
90	1	12,119
<b>Totals</b>	<b>93</b>	<b>\$4,862,301</b>

Average Age at Retirement: 51.4 years  
Average Age Now: 67.0 years

## Active Members -- Comparative Statement

Valuation Date	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Inc.
06-30-93	65	\$3,614,814	40.3	13.5	\$55,613	11.6 %
06-30-94	65	3,428,983	39.7	12.8	52,754	(5.1)%
06-30-95	64	3,404,940	39.1	12.8	53,202	0.8 %
06-30-96	67	3,871,747	39.0	12.4	57,787	8.6 %
06-30-97	66	4,000,390	39.4	12.7	60,612	4.9 %
06-30-98	69	4,245,003	40.1	13.1	61,522	1.5 %
06-30-99	68	4,385,431	39.2	12.4	64,492	4.8 %
06-30-00	69	4,848,076	39.2	12.5	70,262	8.9 %
06-30-01	71	4,692,492	39.4	12.7	66,091	(5.9)%
06-30-02	71	4,898,127	39.8	12.9	68,988	4.4 %
06-30-03	64	4,490,451	37.3	10.2	70,163	1.7 %
06-30-04	67	5,065,923	37.9	10.8	75,611	7.8 %
06-30-05	67	5,239,288	38.9	11.8	78,198	3.4 %
06-30-06	64	5,281,801	39.3	12.4	82,528	5.5 %
06-30-07	63	5,438,968	40.0	13.1	86,333	4.6 %
06-30-08	63	5,759,174	40.7	13.7	91,415	5.9 %
06-30-09	66	5,847,595	40.4	13.6	88,600	(3.1)%
06-30-10	64	5,532,619	40.3	13.5	86,447	(2.4)%
06-30-11	64	4,922,456	37.7	11.2	76,913	(11.0)%
06-30-12	67	4,889,791	37.9	11.0	72,982	(5.1)%
06-30-13	69	4,966,288	38.0	11.1	71,975	(1.4)%
06-30-14	68	5,047,949	39.1	12.4	74,235	3.1 %
06-30-15	63	4,633,108	38.4	12.2	73,541	(0.9)%
06-30-16	64	4,745,297	38.6	12.4	74,145	0.8 %
06-30-17	62	4,841,046	39.0	13.3	78,081	5.3 %

## Active Members Added to and Removed from Rolls

Valuation Date	Number Added During Year		Terminations During Year										Active Members End of Year
			Normal Retirement		Disability Retirement		Died-In-Service		Withdrawals				
	A	E	A	E	A	E	A	E	Vested	Other	Total		
6-30-13	4	2	1	1.3	0	0.1	0	0.1	1	0	1	1.7	69
6-30-14	2	3	0	1.3	0	0.1	0	0.1	0	3	3	1.6	68
6-30-15	2	7	6	2.1	0	0.1	0	0.1	0	1	1	1.0	63
6-30-16	3	2	1	0.8	0	0.1	1	0.1	0	0	0	0.8	64
6-30-17	1	3	1	0.4	0	0.1	0	0.0	0	2	2	0.9	62
5-Year Totals	12	17	9	5.9	0	0.5	1	0.4	1	6	7	6.0	

A = actual

E = expected

## Active Members as of June 30, 2017 by Attained Age and Years of Service

Attained 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
20-24	2							2	\$ 97,480
25-29	4	1						5	287,104
30-34	1	13	1					15	1,007,330
35-39	1	3	1	2				7	475,107
40-44			2	10	2			14	1,190,449
45-49			2	3	8			13	1,207,343
50-54			1		4	1		6	576,233
<b>Total</b>	<b>8</b>	<b>17</b>	<b>7</b>	<b>15</b>	<b>14</b>	<b>1</b>		<b>62</b>	<b>\$ 4,841,046</b>

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

Age: 39.0 years  
 Service: 13.3 years  
 Annual Pay: \$78,081

# Summary of Current Asset Information

## Balance Sheet

Current Assets		Reserve for	
Cash & Equivalents	\$ 3,021,852	Employees' Contributions	\$ 5,217,737
Receivables & Accruals	162,413	Employer Contributions	0
Investments	40,066,630	Retired Benefit Payments	37,677,006
Miscellaneous Assets	0	Excess Earnings	356,152
Total Current Assets	\$43,250,895	Total Reported Reserves	\$43,250,895
Market Adjustment	1,592,855	Market Adjustment	1,592,855
Total Valuation Assets	\$44,843,750	Total Valuation Reserves	\$44,843,750

## Revenues and Expenditures

	2016-2017	2015-2016
Valuation Assets - July 1	\$43,967,577	\$44,321,849
Revenues		
Employees' Contributions	377,556	337,603
Employer Contributions	3,244,840	2,580,266
Recognized Investment Income	2,722,711	2,221,053
Expenditures		
Benefit Payments and Refund of Member Contributions	5,178,850	5,257,307
Investment Expense	290,084	235,887
Valuation Assets - June 30	\$44,843,750	\$43,967,577

Valuation assets are equal to a smoothed asset value. The derivation of valuation assets is shown on page A-4.

## SECTION C

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### ACTUARIAL COST METHOD AND ASSUMPTIONS

# Basic Financial Objective and Operation of the Retirement System

***Benefit Promises Made Which Must Be Paid For.*** A retirement program is an orderly means of handing out, keeping track of, and financing contingent pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit they are, in effect, handed an “IOU” which reads: “The Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire.”

The principal related financial question is: When shall the money required to cover the “IOU” be contributed? This year, when the benefit of the member’s service is received? Or, some future year when the “IOU” becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

“Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities.”

This Retirement System meets this constitutional requirement by having the following ***Financial Objective: To establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year*** and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

*Normal Cost* (the current value of benefits likely to be paid on account of members’ service being rendered in the current year)  
... plus ...  
*Interest on the Unfunded Actuarial Accrued Liability* (the difference between the actuarial accrued liability and current system assets).

If contributions to the retirement program are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

**B**enefit payments to any group of members and their beneficiaries cannot exceed the sum of:

**C**ontributions received on behalf of the group

... plus ...

**I**nterest earnings on contributions received and not required for immediate payment of benefits

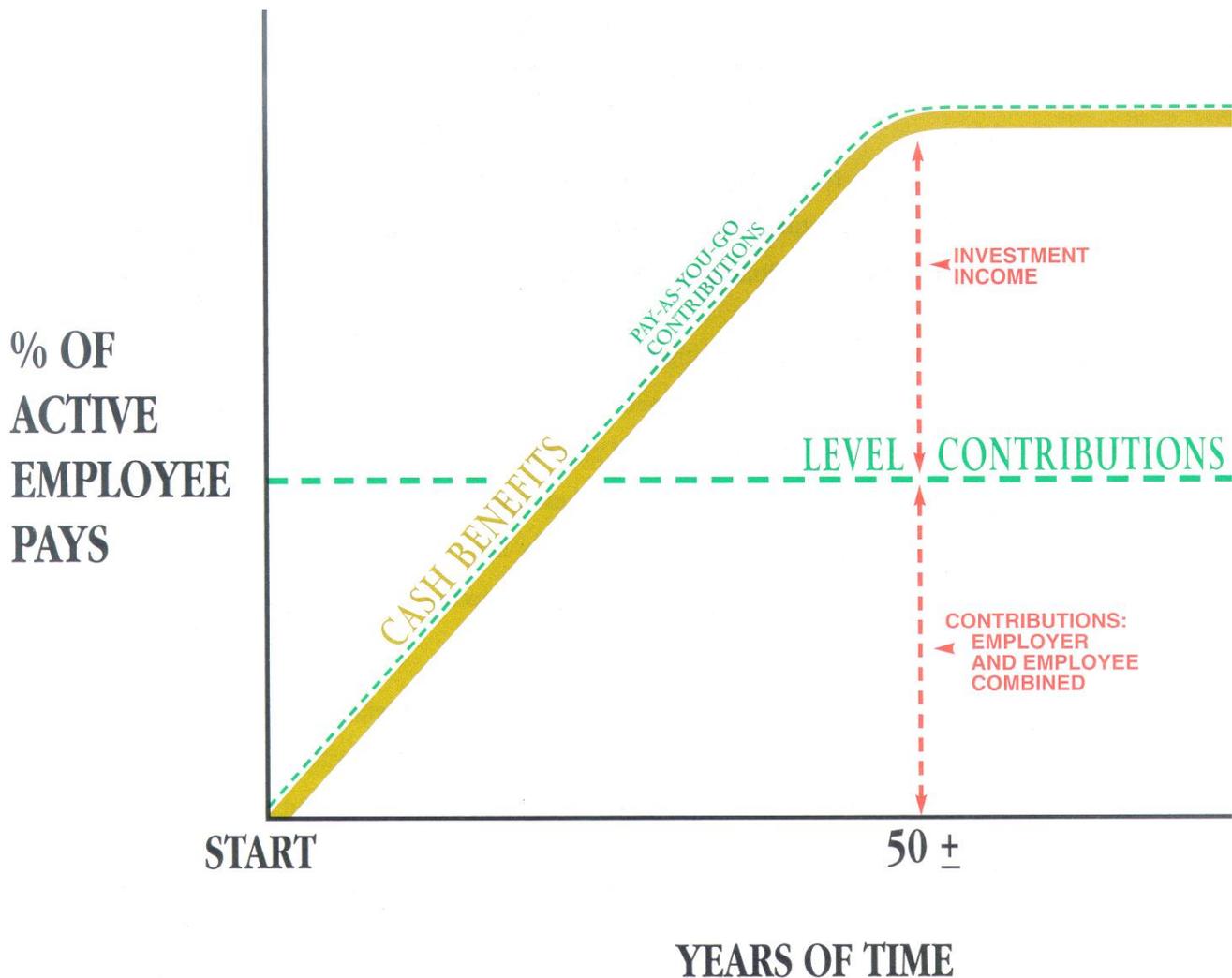
... minus ...

**E**xpenses incurred in operating the program.

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. Investment income becomes the third and largest contributor to the retirement program, and the amount is directly related to the amount of contributions and investment performance.

There are retirement programs designed to defer the bulk of contributions far into the future. Lured by artificially low present contributions, such programs ignore the inevitable consequence of a relentlessly increasing contribution rate -- to a level greatly in excess of the level percent-of-payroll rate. ***This method of financing is prohibited in Michigan by the state constitution.***

**Computed Contribution Rate Needed To Finance Benefits.** From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rate *by means of an actuarial valuation* - the technique of assigning monetary values to the risks assumed in operating a retirement program.



**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

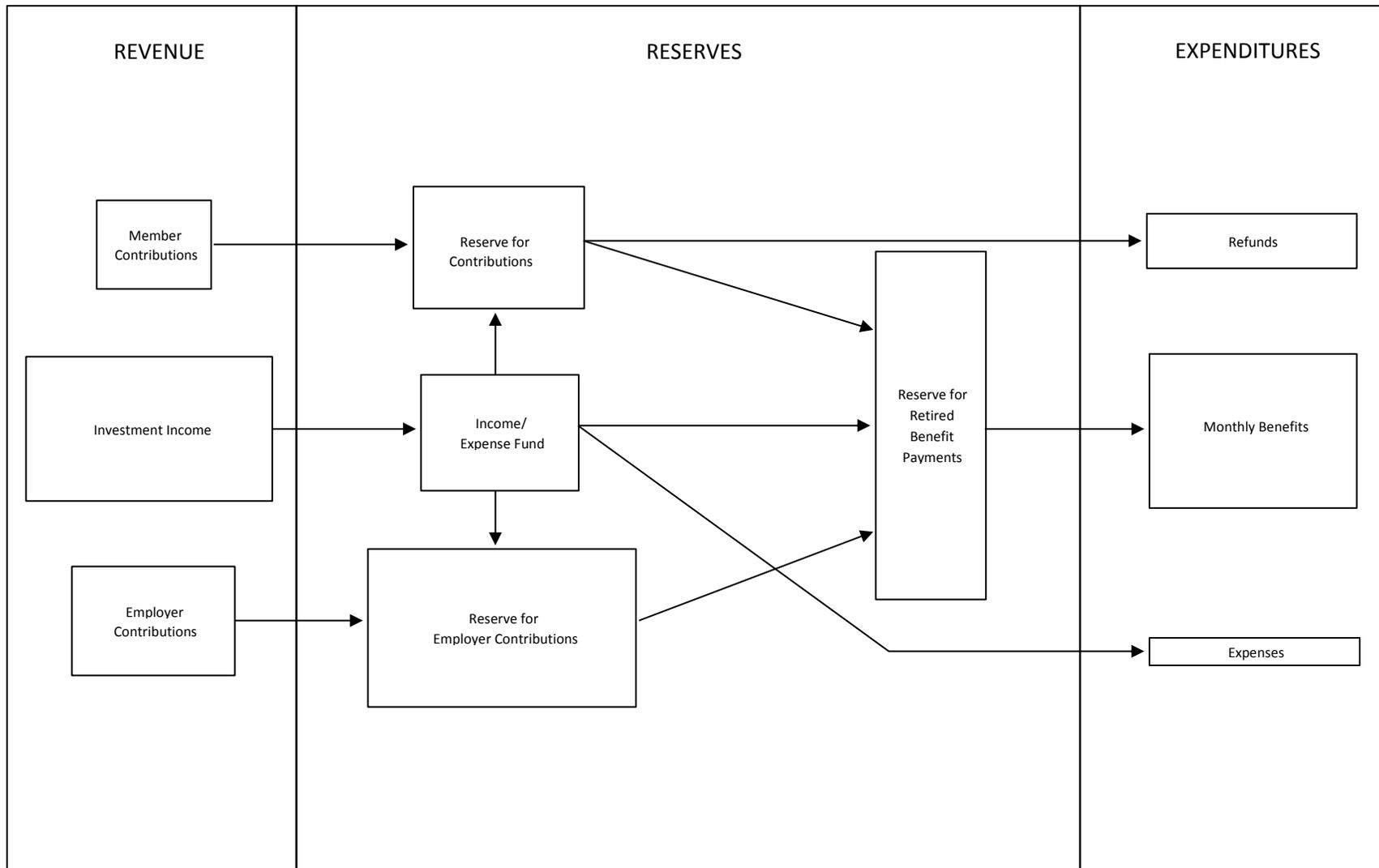
Economic Risk Areas

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

# Flow of Money Through the Retirement System



# Valuation Methods

The assumptions and methods are based on an experience study dated September 9, 2016 adopted by the Board October 20, 2016.

Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an individual **entry-age normal cost valuation method** having the following characteristics:

- the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
- each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

**Financing of Unfunded Actuarial Accrued Liabilities.** The Unfunded Actuarial Accrued Liability (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 percent of pay required to fully amortize the UAAL beginning on the date contributions determined by this report are scheduled to begin. In accordance with the Actuarial Funding Policy, Sections III. C. (1) and (3), a portion of the UAAL was financed over a period of 3 years and the remaining UAAL over a period of 9 years. This UAAL payment reflects payments expected to be made between the valuation date and the date contributions determined by this report are scheduled to begin. Unfunded actuarial accrued liabilities were amortized by level (principal & interest combined) percent-of-payroll contributions.

The **valuation assets** used for funding purposes is derived as follows: Prior year valuation assets are increased by contribution and expected investment income and reduced by refunds, benefit payments and expenses. To this amount is added 25% of the difference between expected and actual investment income for each of the previous four years. The total funding value of assets is limited to 80%/120% of the market value on the valuation date. During periods when investment performance exceeds the assumed rate, actuarial value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, actuarial value of assets will tend to be greater than market value.

# Valuation Assumptions

The actuary calculates the contribution requirements and benefit values of the System by applying actuarial assumptions to the benefit provisions and census data furnished, using the valuation methods described on page C-5.

The principal areas of financial risk which require assumptions about future experiences are:

- long-term rates of investment income likely to be generated by the assets of the Retirement System;
- patterns of salary increases to members;
- rates of mortality among members, retirants and beneficiaries;
- rates of withdrawal of active members;
- rates of disability among members and their subsequent rates of recovery; and
- probabilities of retirement at various ages after benefit eligibility.

In a valuation the actuary projects the monetary effect of each assumption, for each distinct experience group, for the next year and for each year over the next half-century or longer.

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Actual experience will not coincide exactly with assumed experience, regardless of the wisdom of the assumptions. Each valuation provides a complete recalculation of System costs based upon assumptions regarding future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of small adjustments to the computed contribution rate.

From time-to-time it is appropriate to modify one or more of the assumptions, to reflect basic experience trends (but not random year-to-year fluctuations).

## Valuation Assumptions (Continued)

**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 benefit amounts will be based.

Sample Ages	Salary Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economy)	Increase Next Year
20	2.9%	3.5%	6.4%
25	2.3%	3.5%	5.8%
30	2.0%	3.5%	5.5%
35	1.8%	3.5%	5.3%
40	1.6%	3.5%	5.1%
45	1.3%	3.5%	4.8%
50	0.9%	3.5%	4.4%
55	0.5%	3.5%	4.0%
60	0.1%	3.5%	3.6%
Ref:	458		

If the number of active members remains constant, then the total active member payroll will increase 3.5% annually, the base portion of the individual salary increase assumptions.

**The rate of investment** is compounded annually net of expenses.

Investment Return	7.25%
Wage Inflation	3.50%
Price Inflation	2.75%
Spread Between Investment Return and Wage Inflation	3.75%
Spread Between Investment Return and Price Inflation	4.50%

These assumptions are used to equate the value of payments due at different points in time.

Economic experience during the last 5 years has been as follows:

	Year Ended June 30					5-Year Average
	2017	2016	2015	2014	2013	
1) Nominal rate of return*	5.6 %	4.6 %	5.4 %	9.5 %	8.5 %	6.7 %
2) Increase in CPI (6/30)	1.6 %	1.0 %	0.1 %	2.1 %	1.8 %	1.3 %
3) Average salary increase	5.3 %	0.8 %	(0.9)%	3.1 %	(1.4)%	1.4 %
4) Spread between recognized investment return and:						
CPI						5.4 %
Average salary increase						5.3 %

\* The nominal rate of return was computed using the approximate formula:  $i = I$  divided by  $1/2 (A+B-I)$ , where  $I$  is realized investment income net of expenses,  $A$  is the beginning of year asset value and  $B$  is the end of year asset value.

## Valuation Assumptions (Continued)

**The mortality rates** utilized are based upon the RP-2014 tables, as extended, and include a margin for future mortality improvements projected using a fully generational improvement scale. The tables used were as follows:

**Post-Retirement Mortality:** 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. A base year of 2006 is utilized with future mortality improvements assumed each year using scale MP-2015.

**Pre-Retirement Mortality:** 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. A base year of 2006 is utilized with future mortality improvements assumed each year using scale MP-2015.

**Post-Retirement Disabled Mortality:** The RP-2014 Disabled Mortality Tables, extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 is utilized with future mortality improvements assumed each year using scale MP-2015.

These tables were first used for the June 30, 2016 valuation.

Future Life Expectancy (Years)* at Sample Ages						
Sample Age	Health Pre-Retirement <sup>^</sup>		Healthy Post-Retirement		Disabled Retirement	
	Men	Women	Men	Women	Men	Women
45	40.69	45.90	39.04	42.13	28.89	33.87
50	35.46	40.69	34.02	37.04	25.33	29.72
55	30.39	35.57	29.20	32.11	22.07	25.88
60	25.54	30.57	24.63	27.36	18.99	22.26
65	20.99	25.66	20.29	22.78	15.99	18.67
70	16.80	20.88	16.23	18.43	13.06	15.15
75	12.97	16.33	12.54	14.42	10.32	11.93
80	9.58	12.06	9.34	10.88	7.90	9.17
Ref:	2308	2309	2310	2311	2137	2138
Multiplier:	1.00	1.00	1.00	1.00	1.00	1.00
Setback:	0	0	0	0	0	0
Base Year:	2006	2006	2006	2006	2006	2006
MP Scale:	919	920	919	920	919	920

\* Based on retirements in 2017. Retirements in future years will reflect improvements in life expectancy.

<sup>^</sup> 95% of Pre-Retirement Deaths are assumed to be non-duty related and 5% are assumed to be duty related.

## Valuation Assumptions (Continued)

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

Retirement Ages	Percent
50	50%
51	35%
52	30%
53	25%
54	25%
55	25%
56	25%
57	20%
58	20%
59	30%
60	100%
Ref.	557

A member is eligible for retirement at age 50 with 25 years of service or after attaining age 60.

**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	Years of Service	% of Active Members Separating within Next Year
All	0	12.50%
	1	8.50%
	2	5.00%
	3	3.00%
	4	2.50%
25	5 & Over	1.62%
30		1.40%
35		0.83%
40		0.32%
45		0.18%
50		0.18%
55		0.18%
60		0.18%
Ref.		146
		237

## Valuation Assumptions (Concluded)

Rates of disability were as follows. This assumption measures the probability of members retiring with a disability benefit. 10% of disabilities are assumed to be non-duty related and 90% are assumed to be duty related.

Sample Ages	% of Active Members Becoming Disabled within Next Year
20	0.06%
25	0.07%
30	0.10%
35	0.13%
40	0.19%
45	0.29%
50	0.48%
55	0.82%
Ref	256
Multiplier	125%

# Miscellaneous and Technical Assumptions

## June 30, 2017

<b>Marriage Assumption:</b>	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. 90% of active members are assumed to be married at time of retirement. Male spouses are assumed to be three years older than female spouses.
<b>Pay Increase Timing:</b>	Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
<b>Decrement Timing:</b>	Decrements of all types are assumed to occur mid-year.
<b>Eligibility Testing:</b>	Eligibility for benefits is determined using the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
<b>Decrement Relativity:</b>	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
<b>Decrement Operation:</b>	Disability and death decrements do not operate during the first 5 years of service. Disability also does not operate during retirement eligibility.
<b>Loads:</b>	Retirement Present Values, for benefits commencing immediately, were loaded by 17% for all Fire and Police Patrol/Command hired on or before 7/1/2008 (2% for those Police Patrol/Command hired after 7/1/2008) of active member liabilities to account for the additional amount included in the FAC due to unused sick time and unused vacation time.
<b>Option Factors:</b>	Option factors are based upon 7.25% interest and the RP-2014 Healthy Annuitant Mortality Table, with blue collar adjustments and extended via cubic spline with a 100% Unisex Blend. A base year of 2006 is utilized. Future improvements are projected to 2017 with scale MP-2015. The assumptions are effective for retirements after January 1, 2017.
<b>Incidence of Contributions:</b>	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.
<b>Normal Form of Benefit:</b>	A 60% automatic joint and survivor payment is the assumed form of benefit.
<b>Benefit Service:</b>	Exact Fractional service is used to determine the amount of benefit payable.
<b>Annuity Withdrawal:</b>	The actuarial equivalent interest rate for annuity withdrawal was assumed to be 3.0% per year.

# 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.”

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

**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, turn-over 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.

**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.

**Experience Gain (Loss):** A measure of the difference between actual experience and that expected based upon 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.” Any payment toward the unfunded actuarial accrued liability is not part of 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.

## APPENDIX

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## Amortization Payoff Schedule

Date	Period	Unfunded Actuarial Accrued Liability (UAAL) (Beg. of Year)	Funded Ratio (Beg. Of Year)	UAAL Payment %	UAAL Payment \$	Interest	UAAL (End of Year)
June 30, 2017		\$ 27,908,146	61.5%				
July 1, 2018	9, 3	26,551,347	64.0%	68.12%	\$ 3,532,467	\$ 1,798,414	\$ 24,817,294
July 1, 2019	8, 2	24,817,294	66.9%	68.12%	3,656,103	1,668,266	22,829,457
July 1, 2020	7, 1	22,829,457	70.1%	68.12%	3,784,067	1,519,563	20,564,953
July 1, 2021	6	20,564,953	73.6%	67.34%	3,871,925	1,352,239	18,045,268
July 1, 2022	5	18,045,268	77.2%	67.34%	4,007,442	1,164,707	15,202,532
July 1, 2023	4	15,202,532	81.1%	67.34%	4,147,703	953,583	12,008,413
July 1, 2024	3	12,008,413	85.3%	67.34%	4,292,872	716,808	8,432,349
July 1, 2025	2	8,432,349	89.8%	67.34%	4,443,123	452,161	4,441,387
July 1, 2026	1	4,441,387	94.7%	67.34%	4,598,632	157,245	(0)
July 1, 2027	0	(0)	100.0%	0.00%	(0)	(0)	(0)

UAAL at June 30, 2017 adjusted to July 1, 2018 with payments expected to be made between the valuation date and July 1, 2018. Payment based on 7.25% interest and 3.5% wage base over 9 (and 3 for a portion) years beginning on the Fiscal Year starting July 1, 2018.

# Calculation of Excess Earnings Reserve Fund Balance

The schedule below shows the development of the current balance in the Excess Earnings Reserve Fund.

Transaction	Amount
1) Balance as of 7/1/2016	\$390,754
2) 2016 Transfer Amount	0
3) 2016/2017 Scheduled Distribution	35,784
4) 2016/2017 Distribution not made as a result of death	1,182
<b>5) Balance as of 7/1/2017: (1)+(2)-(3)+(4)</b>	<b>356,152</b>
6) 2017 Maximum Transfer Amount	0
7) 2017/2018 Scheduled Distribution	40,896
<b>8) Balance Available for Distribution as of 7/1/2018: (5)+(6)-(7)</b>	<b>\$315,256</b>

The calculations are based on our understanding of the Excess Earnings Distribution Program as described during the Retirement Board meeting of February 21, 2008, and assume a tiered structure payout as of July 1, 2013. This includes a maximum annual transfer equal to 10% of the excess of the rate of return on the actuarial value of Retirement System assets over the assumed rate of return (7.25%) multiplied by the actuarial present value of pensions being paid to retired members and beneficiaries. The calculation of the 2017 maximum transfer amount is detailed below.

Development of Maximum Transfer Amount	
a) Rate of return on Actuarial Value of Assets	5.63%
b) Assumed rate of return on Actuarial Value of Assets	7.25%
c) Excess rate of return: maximum ((a)-(b), 0%)	<u>0.00%</u>
d) Present Value of pensions for retired members and beneficiaries	\$52,144,215
<b>e) 2017 maximum transfer: (c)*(d)*10%</b>	<b>\$ 0</b>

The calculation of the maximum annual amount available to be transferred to the Excess Earnings Reserve Fund is based upon the Retirement Board's direction and is consistent with the Retirement Board's interpretation of Chapter 297.33 of the Code of Ordinances of the City of Southgate.

The balance available for distribution as of July 1, 2018 includes both expected payouts and expected transfers for the 12-month period following June 30, 2017.

# 100-Year Closed Group Projection of Benefit Payments

The benefit projections shown below are based upon the existing plan population as of the valuation date, June 30, 2017, assuming no new entrants in the plan. The projections were prepared assuming all actuarial assumptions are met during the projection period.

<b>Fiscal Year Ending June 30,</b>	<b>Projected Benefit Payment</b>	<b>Fiscal Year Ending June 30,</b>	<b>Projected Benefit Payment</b>	<b>Fiscal Year Ending June 30,</b>	<b>Projected Benefit Payment</b>
2018	\$4,897,026	2051	\$5,871,113	2084	\$741,692
2019	4,893,625	2052	5,691,042	2085	657,269
2020	4,981,175	2053	5,519,881	2086	578,312
2021	5,114,435	2054	5,335,248	2087	504,806
2022	5,312,238	2055	5,158,377	2088	436,761
2023	5,410,465	2056	4,976,612	2089	374,238
2024	5,590,583	2057	4,791,740	2090	317,331
2025	5,916,444	2058	4,608,925	2091	266,090
2026	6,050,396	2059	4,426,211	2092	220,485
2027	6,224,393	2060	4,243,886	2093	180,400
2028	6,395,483	2061	4,062,198	2094	145,633
2029	6,520,305	2062	3,881,391	2095	115,914
2030	6,607,016	2063	3,701,757	2096	90,894
2031	6,684,196	2064	3,523,608	2097	70,154
2032	6,706,051	2065	3,347,295	2098	53,253
2033	6,695,520	2066	3,173,116	2099	39,731
2034	6,688,730	2067	3,001,350	2100	29,106
2035	6,664,622	2068	2,832,369	2101	20,906
2036	6,644,402	2069	2,666,574	2102	14,700
2037	6,955,402	2070	2,504,321	2103	10,111
2038	7,069,108	2071	2,345,889	2104	6,795
2039	7,024,385	2072	2,191,535	2105	4,458
2040	7,114,902	2073	2,041,548	2106	2,848
2041	7,093,627	2074	1,896,226	2107	1,768
2042	7,036,837	2075	1,755,849	2108	1,064
2043	6,993,989	2076	1,620,639	2109	621
2044	6,854,207	2077	1,490,775	2110	351
2045	6,773,428	2078	1,366,454	2111	191
2046	6,695,112	2079	1,247,843	2112	101
2047	6,546,478	2080	1,135,075	2113	53
2048	6,378,254	2081	1,028,175	2114	26
2049	6,204,289	2082	927,056	2115	12
2050	6,040,137	2083	831,600	2116	5
				2117	2

# Actuarial Funding Policy

**WHEREAS**, the City of Southgate Police and Fire Retirement System (“Retirement System”) is established and administered pursuant to the provisions of Public Act 345 of 1937, as amended (MCL 38. 551 *et seq.*), applicable collective bargaining agreements, and applicable state and federal laws including, but not limited to Public Act 314 of 1965, as amended (“Act 314”) [MCL 38.1132 *et seq.*], and

**WHEREAS**, the Board of Trustees of the Retirement System (“Board”) is vested with the authority and fiduciary responsibility for the administration, management and operation of the Retirement System, and

**WHEREAS**, the Board, in consultation with its Actuary, has an obligation to establish the economic and demographic assumptions to be utilized in performing the required actuarial valuation of the Retirement System and in determining the required annual employer contribution to the Retirement System, and

**WHEREAS**, the Board is aware of upcoming changes to the accounting and reporting standards approved by the Governmental Accounting Standards Board (GASB) for public pension plans, and

**WHEREAS**, the Board wishes to establish a formal Actuarial Funding Policy addressing the funding objectives and actuarial assumptions to be utilized in determining the funding status of the Retirement System, therefore be it

**RESOLVED**, that the Board hereby adopts the following Actuarial Funding Policy:

**I. GENERAL**

**A. Purpose**

- (1) In light of upcoming changes to the GASB financial accounting and reporting standards for public pension plans, the Board of Trustees of the Retirement System desires to establish a formal Actuarial Funding Policy to ensure the systematic funding of future pension obligations of the Retirement System.

**B. Policy Objectives**

- (1) Maintain adequate levels of assets sufficient to fund all benefits expected to be paid to members and beneficiaries when due.
- (2) Maintain stability of employer contributions rates, consistent with other funding objectives.
- (3) Support the public policy goals of accountability and transparency.
- (4) Monitor material risks to assist in any risk management strategies the Board deems appropriate.

- (5) Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring costs to future members and employers.
- (6) Provide a reasonable margin for adverse experience to offset risk.
- (7) Review the Plan's investment return assumption, potentially in conjunction with a periodic asset liability study and in consideration of the Board's risk profile.
- (8) Continue the systematic reduction of the Plan's Unfunded Actuarial Accrued Liabilities (UAAL).

## **II. LEGAL**

### **A. Annual Actuarial Valuation**

- (1) Section 20h(4) of Act 314 [MCL 38.1140h(4)], requires the Retirement System to have an actuarial valuation performed annually as follows:

Except as otherwise provided in this subsection, a system shall have an annual actuarial valuation with assets valued on a market-related basis. The actuarial present value of total projected benefits shall include all pension benefits to be provided by the system to members or beneficiaries pursuant to the terms of the system and any additional statutory or contractual agreements to provide pension benefits through the system that are in force at the actuarial valuation date, including, but not limited to, service credits purchased by members, deferred retirement option plans, early retirement programs, and postretirement adjustment programs. A system that has less than \$20,000,000.00 is only required to have an actuarial valuation as required under this subsection done every other year.

### **B. Annual Employer Contribution**

- (1) The Board is required, pursuant to Section 20m of Act 314 [MCL 38.1140m], to annually certify the annual required contribution to be made by the employer as follows:

The governing board vested with the general administration, management, and operation of a system or other decision-making body that is responsible for implementation and supervision of any system shall confirm in the annual actuarial valuation required under section 20h and the summary annual report required under section 13 that each system under this act provides for the payment of the required employer contribution as provided in this section and shall confirm in the summary annual report that the system has received the required employer contribution for the year covered in the summary annual report. The required employer contribution is the actuarially determined contribution amount. An annual required employer contribution in a system under this act shall consist of a current service cost payment and a payment of at least the annual accrued amortized interest on any unfunded actuarial liability and the payment of the

annual accrued amortized portion of the unfunded principal liability. For fiscal years that begin before January 1, 2006, the required employer contribution shall not be determined using an amortization period greater than 40 years. Except as otherwise provided in this section, for fiscal years that begin after December 31, 2005, the required employer contribution shall not be determined using an amortization period greater than 30 years. In a plan year, any current service cost payment may be offset by a credit for amortization of accrued assets, if any, in excess of actuarial accrued liability. A required employer contribution for a system administered under this act shall allocate the actuarial present value of future plan benefits between the current service costs to be paid in the future and the actuarial accrued liability. The governing board vested with the general administration, management, and operation of a system or other decision-making body that is responsible for implementation and supervision of a system shall act upon the recommendation of an actuary and the board and the actuary shall take into account the standards of practice of the Actuarial Standards Board of the American Academy of Actuaries in making the determination of the required employer contribution.

### **III. POLICY**

#### **A. Actuarial Cost Method**

- (1) The individual entry age normal actuarial cost method of valuation shall be utilized in determining actuarial accrued liability and normal cost with the following characteristics:
  - (a) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
  - (b) each annual normal cost is a constant percentage of the member's year by year projected covered pay.
- (2) Differences in the past between assumed experience and actual experience (actuarial gains and losses) shall be factored into the actuarial accrued liability.
- (3) The normal cost shall be determined on an individual basis for each active member.

#### **B. Asset Smoothing Method**

- (1) The investment gains or losses of each valuation period, resulting from the difference between actual investment return and assumed investment return, shall be recognized annually in level amounts over a period not to exceed five (5) years in calculating the funding value of assets.

### **C. Amortization Method**

- (1) A level percent of payroll amortization method shall be used to systematically pay off the unfunded actuarial accrued liabilities over a closed amortization period not to exceed 30 years.
- (2) Unfunded liabilities associated with benefit changes or assumption changes shall be funded over a period to be determined by the Board in consultation with its actuary.
- (3) Unfunded liabilities arising from benefit changes provided to retirees or in conjunction with early retirement incentive programs offered by the employer shall be separately funded over a period to be determined by the Board in consultation with its actuary.
- (4) In the event that the Retirement System's assets exceed its liabilities, all amortization schedules other than those related to benefit changes for retirees or early retirement incentive programs offered by the employer shall be considered completed, and employer contributions will be set based upon the normal cost and the completion of any remaining amortizations due to benefit changes for retirees or early retirement incentive programs offered by the employer, without regard to the overfunding status of the Retirement System.

### **D. Assumptions**

- (1) The economic and demographic actuarial assumptions utilized to determine the contribution requirements and benefit values of the Retirement System shall be determined by the Board in consultation with its actuary.

### **E. Funding Target**

- (1) The targeted funded ratio of the Retirement System shall be 100%.
- (2) The employer contribution rate shall at least be equal to the normal cost unless the funded ratio of the Retirement System exceeds 120%.
- (3) A funding plan shall be developed by the Board in consultation with its actuary if the funded ratio of the Retirement System falls below 50%, which may include additional funding requirements.

### **F. Risk Management**

- (1) Assumption Changes
  - (a) The actuarial assumptions utilized to determine the annual contribution requirements and valuations shall be those last adopted by the Board based on the most recent experience study and upon the advice and recommendation of the Board's actuary. The Board's actuary shall conduct an experience study at least once every five years. The results of the experience study shall be the basis for the actuarial assumptions recommended to the Board.

- (b) The actuarial assumptions may be revised during the five-year period between experience studies if significant plan design changes or other significant economic events occur, as advised by the actuary.
- (2) Risk Measures. The following risk measures will be annually determined to provide quantifiable measurements of risk as it applies to the Retirement System.
- (a) Funded ratio;
  - (b) Unfunded actuarial accrued liabilities – the years required to pay down the unfunded liabilities of the Retirement System based upon the current funding schedule;
  - (c) Total unfunded actuarial accrued liabilities as a percentage of total payroll;
  - (d) Total assets as a percentage of total payroll; and
  - (e) Total actuarial accrued liabilities as a percentage of total payroll.
- (3) Risk Control
- (a) The Board shall carefully monitor the risk measures identified above and shall consider steps to mitigate risk, particularly as the funded ratio increases.

#### **IV. REVIEW AND AMENDMENT**

##### **A. Periodic Review**

- (1) This Actuarial Funding Policy shall be reviewed no less frequently than once every five years in conjunction with the required experience study performed by the Board’s actuary, and may be reviewed at any time at the Board’s discretion.

##### **B. Amendment**

- (1) The Board, in consultation with its Actuary and Legal Counsel, may amend this Actuarial Funding Policy at any time as deemed necessary to address changes in the makeup, benefit structure and/or funding status of the Retirement System.

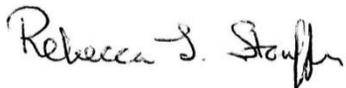
February 19, 2018

Mr. Marc Hatfield, Secretary  
City of Southgate  
14730 Reaume Parkway  
Southgate, Michigan 48195-2503

Dear Marc:

Please find enclosed 10 copies of the report of the 63rd Annual Actuarial Valuation as of June 30, 2017 for the City of Southgate Policemen and Firemen Retirement System. We look forward to meeting with you to review the report.

Sincerely,



Rebecca L. Stouffer, ASA, MAAA

RLS:bd  
Enclosures

cc: David Angileri, Finance Director (+ 2 report copy)  
Darcie Cheney, Asst. Finance Director (+1 report copy)  
Jack Timmony (+1 report copy)