

City of Allen Park
Employees Retirement System
69th Annual Actuarial Valuation
December 31, 2017



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May 8, 2018

Board of Trustees
City of Allen Park Employees Retirement System
Allen Park, Michigan

Dear Board Members:

The results of the 69th Annual Actuarial Valuation of the benefits provided by the City of Allen Park Employees Retirement System are presented in this report.

The date of the valuation was December 31, 2017. The purposes of the valuation are to measure the System's funding progress and to determine an employer contribution rate for the next fiscal year. The results of the valuation may not be applicable for other purposes. Information required by the Governmental Accounting Standard Board (GASB) Statement Nos. 67 and No. 68 will be provided in a separate report.

Valuation results, comments and conclusions are contained in Section A. The computed contribution rates shown on page A-2 may be considered as a minimum contribution rate that complies with the System'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 in excess of those presented in this report be considered.

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 valuation was based upon information, furnished by the City of Allen Park staff, concerning Retirement System benefits, financial transactions, and individual members, terminated members, retirees and beneficiaries. Data was checked for internal and year-to-year consistency, but was not audited. We are not responsible for the accuracy or completeness of the data provided. This information is summarized in Section B.

The actuarial methods and assumptions used in the actuarial valuation are summarized in Section C of this report. The assumptions are established by the Board after consulting with the actuary. This report does not include a robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of the 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.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice prescribed by the Actuarial Standards Board and in compliance with the Retirement System Ordinance. The actuarial assumptions used for the valuation are reasonable.

Jeffrey T. Tebeau and Derek Henning are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing individuals are independent of the plan sponsor.

Respectfully submitted,



Jeffrey T. Tebeau, ASA, EA, MAAA



David L. Hoffman



Derek Henning, ASA, MAAA

JTT/DLH/DAH:clh:bd



SECTION A

VALUATION RESULTS

Computed Contributions for the Fiscal Year Beginning July 1, 2018

Contributions for	% of Active Member Payroll				Weighted Average
	General Members	Police-Fire Members	Water Department Members	Court Members	
Normal Cost					
Age and service	16.18 %	17.47 %	16.18 %	16.18 %	
Death before retirement	0.21 %	0.26 %	0.21 %	0.21 %	
Disability	1.63 %	1.72 %	1.63 %	1.63 %	
Future refunds	0.73 %	0.33 %	0.73 %	0.73 %	
Service purchases	0.43 %	0.00 %	0.43 %	0.43 %	
Total	19.18 %	19.78 %	19.18 %	19.18 %	
Member Contributions	7.00 %	7.00 %	7.00 %	7.00 %	
City's Normal Cost	12.18 %	12.78 %	12.18 %	12.18 %	12.65 %
Unfunded Actuarial Accrued Liabilities*	66.89 %	18.54 %	66.89 %	66.89 %	28.47 %
City's Total Contribution	79.07%	31.32%	79.07%	79.07%	41.12%

* Amortized as a level percent-of-payroll over a period of 21 remaining years for the Police-Fire members (starting amortization period of 25 years). Amortized as a level dollar amount over a period of 15 remaining years for the General (including Administrative and Appointees), Water Department, and Court members (starting amortization period of 20 years). Total payroll as of December 31, 2017 was \$6,306,637 (\$1,376,626 for General groups, \$4,930,011 for Police-Fire groups).

Computed Contributions for the Fiscal Year Beginning July 1, 2018

Determining Employer Dollar Contributions

For any period of time, the percent-of-payroll contribution rate needs to be converted to dollars -- and then promptly contributed to the Retirement System.

There are alternate recommended administrative procedures for making contributions, described as follows:

Procedure 1: At the end of each payroll period, multiply the active member payroll for the period by the employer contribution percent, and then promptly contribute the dollar amount so determined. This procedure should be closely monitored as the payroll of closed groups decline.

Procedure 2: During each fiscal month, contribute the monthly dollar amount shown in the table below:

	Projected Annual Payroll	%	Dollar Contributions	
			Annual	Monthly
General	\$ 529,136	79.07%	\$ 418,388	\$ 34,866
Water	96,802	79.07%	76,541	6,378
Court	704,121	79.07%	556,748	46,396
Police & Fire	5,153,517	31.32%	1,614,082	134,507
Total	\$6,483,576	41.12%	\$2,665,759	\$222,147

For either procedure, if contributions are made on a later schedule, interest should be added at the rate of 0.583% (0.00583) for each month of delay.

It is our understanding that at the August 7, 2014 Board Meeting, the Board adopted to contribute based on Procedure 2 outlined above.

Valuation Assets and Actuarial Accrued Liabilities

In financing the actuarial accrued liabilities, valuation assets of \$88,898,596 were distributed as follows:

Reserves for	Retired Life Liabilities*	Member Actuarial Accrued Liabilities	Contingency Reserve	Totals
Members' Contributions				
General, Water & Court Members		\$2,021,586		\$ 2,021,586
Police & Fire		5,024,555		5,024,555
Totals		7,046,141		7,046,141
Employer Contributions				
General, Water & Court Members		(1,495,852)		(1,495,852)
Police & Fire		4,561,915		4,561,915
Totals		3,066,063		3,066,063
Retired Benefit Payments				
General, Water & Court Members	\$28,813,314			28,813,314
Police & Fire	49,973,078			49,973,078
Totals	78,786,392			78,786,392
Totals	\$78,786,392	\$10,112,204	\$ none	\$88,898,596

* Based on the assumption that a reserve transfer will be made from the Employer Contribution Reserve to the Retiree Reserve, setting the Retiree Reserve equal to retired life liabilities.

Assets were applied against actuarial accrued liabilities in determining unfunded actuarial accrued liabilities as follows:

	Retired Lives	Active and Deferred Members	Total
Computed Actuarial Accrued Liabilities	\$78,786,392	\$31,522,833	\$110,309,225
Applied Assets	78,786,392	10,112,204	88,898,596
Unfunded Actuarial Accrued Liabilities	\$ 0	\$21,410,629	\$ 21,410,629

Derivation of Experience Gain (Loss) Year Ended December 31, 2017

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, along with a year-by-year comparative schedule.

(1)	UAAL* at start of year	\$ 21,498,982
(2)	Normal cost from last valuation	1,250,482
(3)	Actual contributions	3,107,140
(4)	Interest accrual: $[(1) \times .070] + [(2) - (3)] \times .0350$	1,439,946
(5)	Expected UAAL before changes: $(1) + (2) - (3) + (4)$	21,082,270
(6)	Change from benefit modifications	7,646
(7)	Change from revised actuarial assumptions	0
(8)	Expected UAAL after changes: $(5) + (6) + (7)$	21,089,916
(9)	Actual UAAL at end of year	21,410,629
(10)	Gain (loss): $(8) - (9)$	(320,713)
(11)	Gain (loss) as percent of actuarial accrued liabilities at start of year (\$108,398,620)	(0.3%)

* *Unfunded actuarial accrued liability.*

Valuation Date December 31	Experience Gain (Loss) as % of Beginning Accrued Liability
2008	(11.6)%
2009	(4.1)%
2010	(4.4)%
2011	(5.8)%
2012	1.7%
2013	5.5%
2014	5.0%
2015	0.1%
2016	0.2%
2017	(0.3%)

Summary Statement of System Resources and Obligations

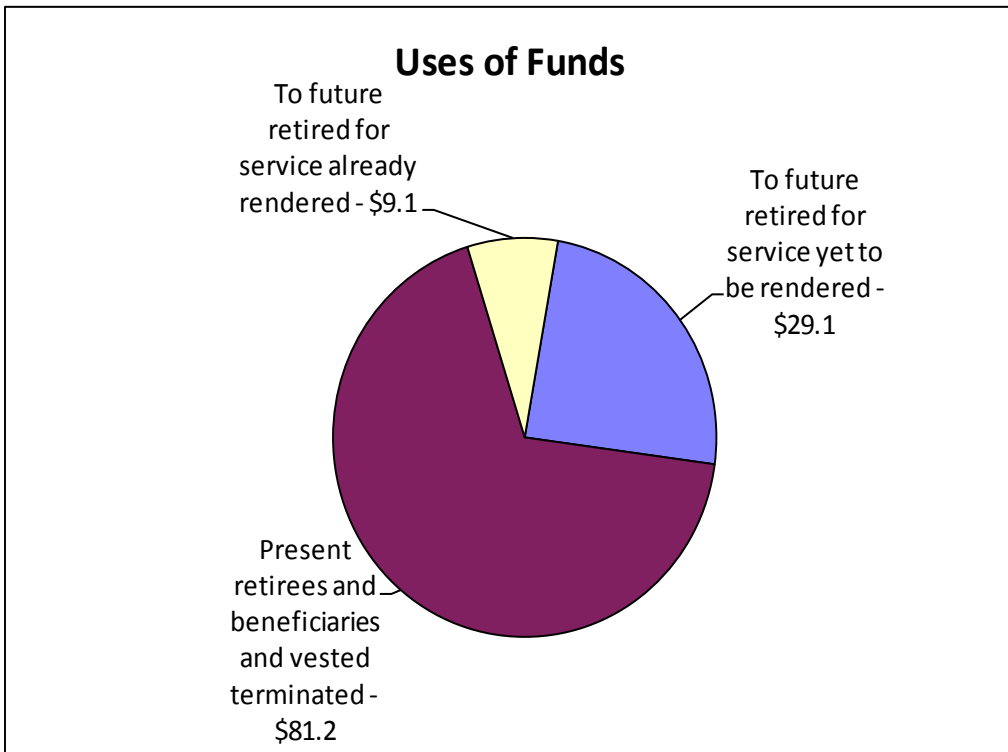
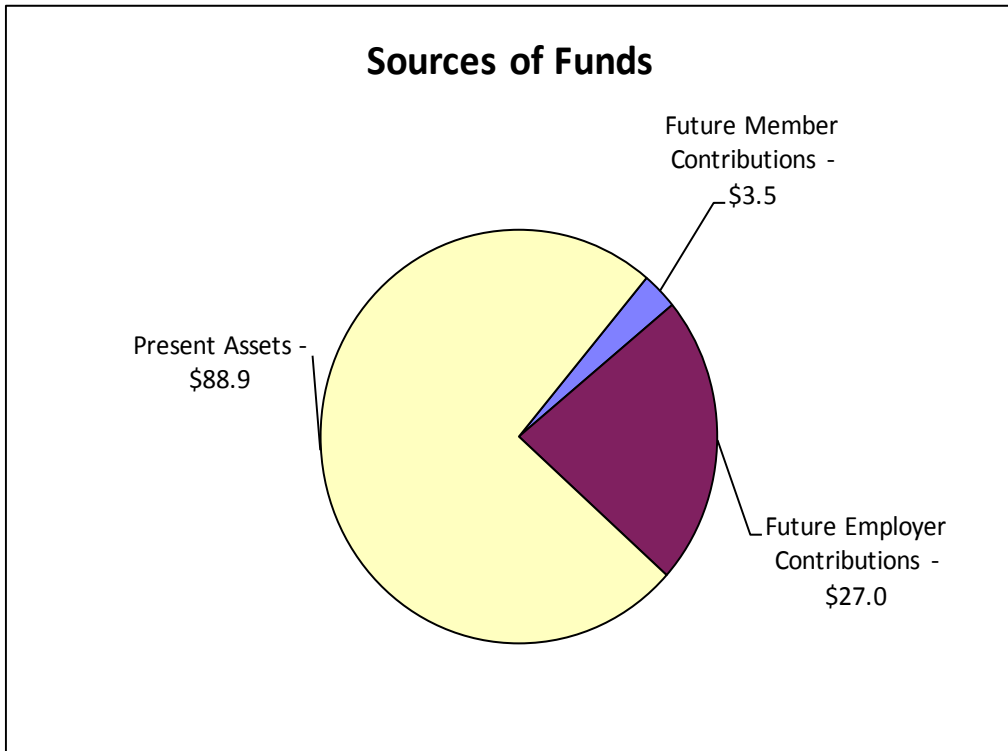
PRESENT RESOURCES AND EXPECTED FUTURE RESOURCES

	General, Water & Court Members	Police & Fire	Totals
A. Actuarial value of System assets	\$29,339,048	\$59,559,548	\$ 88,898,596
B. Present value of expected future employer contributions			
1. For normal costs	976,384	4,654,999	5,631,383
2. For unfunded actuarial accrued liability	8,236,182	13,174,447	21,410,629
3. Total	9,212,566	17,829,446	27,042,012
C. Present value of expected future member contributions	608,027	2,862,505	3,470,532
D. Total present and expected future Resources	\$39,159,641	\$80,251,499	\$119,411,140

PRESENT VALUE OF EXPECTED FUTURE BENEFIT PAYMENTS

A. To retirees and beneficiaries	\$28,813,314	\$49,973,078	\$78,786,392
B. To vested terminated members	1,244,236	1,157,831	2,402,067
C. To present active members			
1. Allocated to service rendered prior to valuation date - actuarial accrued liability	7,517,680	21,603,086	29,120,766
2. Allocated to service likely to be rendered after valuation date	1,584,411	7,517,504	9,101,915
3. Total	9,102,091	29,120,590	38,222,681
D. Total present value of expected future benefit payments	\$39,159,641	\$80,251,499	\$119,411,140

Financing \$119.4 Million of Benefit Promises December 31, 2017



Comparative Statement (\$ in thousands)

Valuation Date December 31	Actuarial Accrued Liability (AAL)	Present Assets	Unfunded Actuarial Accrued Liability (UAAL)	Ratio of Present Assets To AAL	Ratio of UAAL to Valuation Payroll	Employer Contributions As Payroll Percents	
						Gen., Court & Water Members	Police & Fire Members
2002*	\$ 68,118	\$ 72,436	\$ (4,318)	106.3 %	(40.0)%	13.23%	11.43%
2003 #	73,437	73,490	(53)	100.1 %	(0.5)%	17.39%	14.69%
2004	76,844	76,064	780	99.0 %	7.1 %	17.30%	15.60%
2005	82,928	77,809	5,119	93.8 %	52.2 %	25.77%	16.46%
2006*	86,334	81,926	4,408	94.9 %	47.3 %	27.60%	14.98%
2007*#	90,176	83,991	6,185	93.1 %	69.4 %	32.71%	18.21%
2008*	96,025	79,485	16,540	82.8 %	181.3 %	38.93%	31.23%
2009*	97,732	77,077	20,654	78.9 %	224.4 %	51.99%	28.02%
2010#	98,700	74,681	24,018	75.7 %	313.5 %	79.02%	30.30%
2011	99,812	70,080	29,732	70.2 %	419.4 %	95.58%	36.81%
2012#	101,346	72,804	28,541	71.8 %	419.6 %	77.92%	36.53%
2013*	99,791	75,399	24,392	75.6 %	421.0 %	79.22%	31.01%
2014*	104,368	80,950	23,418	77.6 %	446.0 %	84.88%	33.86%
2015*	107,191	84,329	22,862	78.7 %	391.1 %	77.23%	34.09%
2016*	108,399	86,900	21,499	80.2 %	346.4 %	73.52%	31.64%
2017	110,302	88,899	21,403	80.6 %	339.4 %	79.78%	31.32%
2017*	110,309	88,899	21,411	80.6 %	339.5 %	79.07%	31.32%

Revised actuarial assumptions or methods.

* Retirement System was amended.

The Ratio of Valuation Assets to AAL is a traditional measure of a system's funding progress. Except in years when the system is amended or actuarial assumptions are revised, this ratio can be expected to increase gradually toward 100%.

The Ratio of UAAL to Valuation Payroll is another relative index of condition. Unfunded actuarial accrued liabilities represent debt, while active member payroll represents the system's capacity to collect contributions to pay toward debt. The lower the ratio, the greater the financial strength - and vice-versa.

Comments, Recommendations and Conclusion

Experience

Overall there was a small actuarial loss of \$320,713 during the year ended December 31, 2017 (see page A-4). On a market value basis, this year's investments outperformed the assumption of 7% (see page B-13); the result of this and the phase-in of 2014-2016 investment gains and losses yielded an asset gain on a funding value basis of \$0.1 million; offsetting losses were attributable to greater than expected new retiree liabilities.

Benefit Changes

The December 31, 2017 valuation includes a change to the benefit formula for Court members effective July 1, 2017. The impact of the change in benefits increased the Unfunded Actuarial Accrued Liability by \$ 7,646, however, the City's contribution rate decreased by 0.71%. Additional information about the impact of the benefit changes is on page A-7.

Funded Status

The ratio of the Funding Value of Assets to Actuarial Accrued Liability is 78.1% for General, Water and Court, and 81.9% for Police and Fire.

The funded status for the System as a whole is 80.6%, based on the Funding Value of Assets. On the basis of the Market Value of Assets, the funded status would be 83.8%. This indicates that deferred asset gains should increase the funded status as they become recognized (absent future losses).

Amortization Schedule

The remaining amortization periods are 21 years for Police and Fire and 15 years for General, Water and Court. As both amortization schedules wind down in the future (to 5 years or less), the computed contributions may become more volatile. In an effort to mitigate the potential adverse effects of this scenario, we suggest the Board consider implementing a "layered" amortization schedule, in which new actuarial gains and losses each valuation year are individually amortized.

Asset Allocation

The Retirement System does not provide information allocating the Market Value of Assets between General, Court, and Water and Police and Fire. The allocation of the actuarial value of assets is shown on page B-14. We recommend that the System allocate a full reconciliation of the market value of assets each year.

Comments, Recommendations and Conclusion

Asset Reconciliation

Certain information provided to us regarding the financial statements did not reconcile the ending Market Value of Assets that was used in this valuation. In particular, the implied assets (last year's Market Value plus this year's revenues minus this year's expenditures) was approximately \$24k less than the reported ending Market Value. It is our understanding that staff is looking into this difference. If the final Market Value of Assets or any items included in the Non-Investment Net Cash Flow (row D on page B-13) are changed, then this report will need to be revised.

GASB Reporting Standards

The GASB Statement Nos. 67 and 68 reporting disclosures required for the plan this year will be issued in a separate report.

Reserve Transfers

The actuarial present value of retirement allowances currently being paid to retired members is less than the balance in the Reserve for Retired Benefit Payments. In order to fully fund retired life liabilities, we recommend a transfer in the amount of \$45,620,016 from the Reserve for Employer Contributions to the Reserve for Retired Benefit Payments. The transfer was assumed to have been made as of December 31, 2017 for purposes of this valuation. Our understanding is that this is a bookkeeping entry only, and does not affect funding or benefits. If the System elects to allocate reserves between groups, additional information on retiree liability by group is shown on page A-5.

Asset Corridor

On May 9, 2012, the Board elected to utilize a corridor in the Funding Value of Assets beginning in the December 31, 2012 valuation. This corridor limits the divergence of the Funding Value relative to the Market Value at 25% (i.e., the Funding Value would be limited to the range of 75% to 125% of the Market Value of Assets). As of December 31, 2017, the ratio of the Funding Value to the Market Value is 96.2%; therefore, the corridor did not affect the December 31, 2017 valuation.

Conclusion

The Retirement System's financial objective is to meet long-term benefit obligations through contributions that remain approximately level from year to year as a dollar amount for General, Water and Court, and as a percent of active member payroll for Police and Fire. Continued receipt of these contributions is the best guarantee that the System will be able to pay all promised benefits when due.

The System's funded ratio increased this year in part due to timely receipt of employer contributions. This valuation assumes that the plan sponsor will be able to make future contributions on a timely basis. Failure to receive employer contributions on a timely basis could jeopardize the sustainability of the fund. We did not perform an analysis of the ability of the plan sponsor to make future contributions.

Other Observations

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

Given the System's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the Retirement System earning 7.00% on the Market Value of Assets), it is expected that:

1. The employer normal cost is sufficient to cover the cost of benefits accruing each year;
2. The Unfunded Actuarial Accrued Liabilities (UAAL) will be fully amortized after the respective amortization periods end; and
3. The funded status of the Retirement System will continue to 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 (AAL) and the Funding Value of Assets (FVA). Unless otherwise indicated, with regard to any funded status measurements presented in this report:

1. The measurement is inappropriate for assessing the sufficiency of Retirement System assets to cover the estimated cost of settling the Retirement System's benefit obligations, for example: transferring the liability to an unrelated third party in a market value type transaction.
2. The measurement is dependent upon the Actuarial Cost Method which, in combination with the Retirement System's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. Even if the funded status were over 100%, the Retirement System would still require future normal cost contributions (i.e., contributions to cover the cost of active membership accruing an additional year of service credit).
3. The measurement would produce a different result if the Market Value of Assets (MVA) were used instead of the FVA, unless the MVA is used in the measurement.

Limitations of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entities to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

SECTION B

BENEFIT PROVISIONS AND VALUATION DATA

Summary of Benefit Provisions Evaluated December 31, 2017

Closed to new AFSCME hires effective October 2005 and Administrative/Appointee new hires effective January 2008.

Regular Retirement

LIEUTENANTS & SERGEANTS

Eligibility

Age 52 & 10 years of service.

Benefit Amount

Multiplier x Service x Final Average Compensation (FAC) based on the following schedule:

	If Hired:	Service Before 7/1/2013	Service Between 7/1/2013- 7/1/2015	Service After 7/1/2015	Maximum Benefit Lesser of:	
					% Max	\$ Max
Before	7/1/2008	2.90%	2.25%	2.50%	75%	\$80,000
Between	7/1/2008 - 1/1/2013	2.50%	2.25%	2.50%	75%	\$80,000
Between	1/1/2013 - 7/1/2015	2.00%	2.00%	2.50%	75%	\$80,000
After	7/1/2015	-	-	2.25%	75%	\$80,000

Final Average Compensation

FAC is computed as the average of the covered compensations paid during the highest 3 consecutive years of service out of the last 10 years of service.

Members hired on or after July 1, 2008 shall not have their overtime included in the FAC.

In the event of any discrepancy between what is outlined in this Summary of Benefits and individual contracts, the provisions within the contracts shall supersede.

Summary of Benefit Provisions Evaluated December 31, 2017

POLICE

Eligibility

Age 52 & 10 years of service.

Benefit Amount

Multiplier x Service x Final Average Compensation (FAC) based on the following schedule:

		Service	Service	Service	Maximum Benefit Lesser of:	
		Before	Between	After	%	\$
<u>If Hired:</u>		<u>7/1/2013</u>	<u>7/1/2013-</u> <u>7/1/2015</u>	<u>7/1/2015</u>	<u>Max</u>	<u>Max</u>
Before	12/16/2008	2.90%	2.25%	2.50%	75%	\$70,000
	12/16/2008-					
Between	1/1/2013	2.50%	2.25%	2.50%	75%	\$70,000
Between	1/1/2013 - 7/1/2015	2.00%	2.00%	2.50%	75%	\$70,000
After	7/1/2015	-	-	2.25%	75%	\$70,000

Final Average Compensation

FAC is computed as the average of the covered compensations paid during the highest 3 consecutive years of service out of the last 10 years of service.

Members hired on or after December 16, 2008 shall not have their overtime included in the FAC.

In the event of any discrepancy between what is outlined in this Summary of Benefits and individual contracts, the provisions within the contracts shall supersede.

Summary of Benefit Provisions Evaluated December 31, 2017

FIRE

Eligibility

Age 52 & 10 years of service if hired before January 1, 2013.

Age 55 & 25 years of service if hired on or after January 1, 2013.

Benefit Amount

Multiplier x Service x Final Average Compensation (FAC) based on the following schedule:

	If Hired:	Service Before 7/1/2013	Service After 7/1/2015	% Max
Before	7/1/2008	2.90%	2.50%	75% (80% for Fire Chief)
Between	7/1/2008 - 1/1/2013	2.50%	2.50%	75%
After	1/1/2013	2.00%	2.00%	75%

Final Average Compensation

FAC is computed as the average of the covered compensations paid during the highest 3 consecutive years of service out of the last 10 years of service for members hired before January 1, 2013 and the average of the highest 5 consecutive years out of 10 for members hired on or after January 1, 2013.

Members hired on or after July 1, 2008 shall not have their overtime included in the FAC. Members hired on or after January 1, 2013, FAC will include base salary only.

GENERAL

Eligibility

Age 53 & 10 years of service.

Benefit Amount

Multiplier x Service x Final Average Compensation (FAC) based on the following schedule:

Service Before 3/28/2014	Service After 3/28/2014	% Max
2.90%	2.50%	75%

Final Average Compensation

FAC is computed as the average of the covered compensations paid during the highest 3 consecutive years of service out of the last 10 years of service.

In the event of any discrepancy between what is outlined in this Summary of Benefits and individual contracts, the provisions within the contracts shall supersede.

Summary of Benefit Provisions Evaluated December 31, 2017

ADMINISTRATIVE/APPOINTEES

Eligibility: Age 53 & 8 years of service or 25 years of service and any age.

Benefit Amount: Multiplier x Service x FAC based on the following schedule:

Service Before 7/1/2013	Service After 7/1/2013	% Max
2.90%	2.50%	75%

Final Average Compensation

FAC is computed as the average of the covered compensations paid during the highest 3 consecutive years of service out of the last 10 years of service.

COURT

Eligibility: Age 53 & 10 years of service.

Benefit Amount: Multiplier x Service x FAC based on the following schedule:

Service Before 7/1/2017	Service After 7/1/2017	% Max
2.90%	2.50%	75%

Final Average Compensation

FAC is computed as the average of the covered compensations paid during the highest 3 consecutive years of service out of the last 10 years of service.

Annuity Withdrawal

Up to 2 Police and Fire members and 3 Lieutenants and Sergeants may elect to withdraw 50% of their accumulated contributions at retirement. The benefit otherwise payable is actuarially reduced based upon PBGC assumptions. This is not available to Fire members hired on or after January 1, 2013.

Deferred Retirement (Vested Benefit)

Eligibility

Termination at any age with 10 (8 for Administrative/Appointees) or more years of service.

Annual Amount

Computed in the same manner as regular retirement based upon service and FAC at time of termination.

In the event of any discrepancy between what is outlined in this Summary of Benefits and individual contracts, the provisions within the contracts shall supersede.

Summary of Benefit Provisions Evaluated December 31, 2017

Duty Disability Retirement

Eligibility

No age or service requirements.

Annual Amount

To normal retirement age (retirement eligibility age plus 5 years): 66 2/3% of final compensation at time of disability. At normal retirement age the benefit is recomputed based on a regular retirement formula with additional service credit granted from the date of disability to the date of recomputation and a final average compensation based upon the pay of the rank during the 3 years preceding normal retirement date. Worker's compensation payments are offset. For Fire members, the benefit is recomputed at retirement eligibility age.

Non-Duty Disability Retirement

Eligibility

10 (8 for Administrative/Appointees) or more years of service.

Annual Amount

Police and Lieutenants & Sergeants: Computed based on a regular retirement formula (with service as of the date of disability). Minimum benefit is 20% of FAC.

All other groups: To normal retirement age (or until recovered from disability): Computed in the same manner as regular retirement, but using a 2% benefit multiplier. At normal retirement age, the benefit is recomputed based on a regular retirement formula (with service as of the date of disability). Minimum benefit is 20% of FAC.

Duty Death Before Retirement

Eligibility

No age or service requirements.

Annual Amount

To the surviving spouse until death, age 62, or remarriage, whichever occurs first, a benefit of 50% of deceased member's final compensation (75% for Lieutenants & Sergeants, and Police & Fire). If there is no surviving spouse, unmarried children under age 18 receive equal shares of 50%, (75% for Lieutenants & Sergeants, and Police & Fire) of the deceased member's final compensation.

Worker's compensation payments are offset.

In the event of any discrepancy between what is outlined in this Summary of Benefits and individual contracts, the provisions within the contracts shall supersede.

Summary of Benefit Provisions Evaluated December 31, 2017

Non-Duty Death Before Retirement

Eligibility

10 (8 for Administrative/Appointees) or more years of service and attainment of voluntary retirement age or 15 or more years of service.

Annual Amount

Computed in the same manner as regular retirement but actuarially reduced in accordance with a 100% joint and survivor election.

Death after Retirement Survivor's Pension

Payable to a surviving spouse (of a Lieutenant or Sergeant), if any, upon the death of a retired member who was receiving a straight life pension. Spouse's pension equals 70% of the straight life pension the deceased retiree was receiving.

Member Contributions

7.0% of covered compensation for all eligible employees. Covered compensation includes base salary, longevity, and pay in lieu of vacation time. For Lieutenants & Sergeants and Firefighters, overtime and pay in lieu of holiday pay. For Lieutenants & Sergeants, Police Officers and Firefighters, up to 10 days of unused vacation time and 42 days of unused sick time.

In the event of any discrepancy between what is outlined in this Summary of Benefits and individual contracts, the provisions within the contracts shall supersede.

Retirees and Beneficiaries Comparative Statement

Year Ended December 31*	Added to Rolls		Removed from Rolls		Rolls End of Year		Average Pension	Present Value of Pension	No. Active Per Retired	Pensions as a % of Pay
	No.	Annual Pensions@	No.	Annual Pensions#	No.	Annual Pensions				
1997	5	\$ 170,333	2	\$ 10,980	126	\$2,229,510	\$17,695	\$22,967,013	1.6	24.7 %
1998	2	73,587	1	4,932	127	2,298,165	18,096	23,408,199	1.6	25.5 %
1999	11	336,451	2	20,391	136	2,614,225	19,222	26,706,290	1.5	28.0 %
2000	3	89,448	7	55,293	132	2,648,380	20,063	26,867,023	1.6	25.5 %
2001	6	133,560	7	148,237	131	2,633,703	20,105	26,856,381	1.6	24.5 %
2002	11	348,496	3	75,278	139	2,906,921	20,913	29,833,759	1.5	27.0 %
2003	10	365,532	4	54,369	145	3,218,084	22,194	35,766,859	1.3	30.5 %
2004	4	131,904	2	23,681	147	3,326,306	22,628	37,196,728	1.3	31.3 %
2005	28	1,128,076	2	21,063	173	4,433,319	25,626	51,215,945	0.9	47.4 %
2006	16	502,037	7	165,373	182	4,769,983	26,209	53,477,694	0.8	52.8 %
2007	20	785,842	9	151,775	193	5,404,051	28,000	60,160,954	0.8	61.3 %
2008	19	743,733	3	37,524	209	6,110,260	29,236	67,228,096	0.7	67.0 %
2009	5	138,063	2	38,115	212	6,210,208	29,293	67,661,780	0.7	67.5 %
2010	20	627,490	5	65,361	227	6,772,337	29,834	73,857,811	0.5	88.4 %
2011	9	265,620	6	129,561	230	6,908,395	30,037	74,533,739	0.4	97.5 %
2012	5	128,793	5	142,161	230	6,895,027	29,978	73,695,255	0.4	101.4 %
2013	2	52,485	2	14,879	230	6,932,633	30,142	73,116,820	0.4	119.6 %
2014	6	186,157	12	251,720	224	6,867,070	30,657	77,266,519	0.4	130.8 %
2015	2	77,884	5	64,112	221	6,880,842	31,135	76,663,426	0.4	117.7 %
2016	4	121,547	1	35,024	224	6,967,365	31,104	76,810,323	0.4	112.3 %
2017	8	338,206	6	135,668	226	7,169,903	31,725	78,786,392	0.4	113.7 %

Includes adjustments due to attainment of age 65.

* Does not include DROP members.

@ Includes beneficiaries of deceased retirees.

Retirees and Beneficiaries – December 31, 2017 Tabulated by Type of Pensions Being Paid

Type of Pensions Being Paid	No.	Annual Pensions
Age and Service Pensions		
Regular pension - benefit terminating at death of retiree	56	\$1,406,187
Regular pension - automatic 70% to survivor	14	941,916
Option A pension - joint and survivor benefit	80	3,007,812
Option B pension - modified joint and survivor benefit	36	861,558
Survivor pension	21	428,312
Total age and service pensions	207	\$6,645,785
Casualty Pensions		
Duty disability		
Regular pension	6	\$ 176,138
Survivor pension	1	23,972
Totals	7	200,110
Non-duty disability		
Option A pension	6	202,279
Option B pension	1	27,204
Survivor pension	1	28,212
Totals	8	257,695
Pension to survivor beneficiary of deceased member - non-duty death	4	66,313
Total casualty pensions	19	524,118
Total Pensions Being Paid	226	\$7,169,903

Retirees and Beneficiaries – December 31, 2017 Tabulated by Attained Ages

Attained Ages	Age and Service		Casualty		Totals	
	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances
Under 40						
40 - 44			1	\$ 42,960	1	\$ 42,960
45 - 49	3	\$ 79,234	2	87,820	5	167,054
50 - 54	5	255,853	1	27,204	6	283,057
55 - 59	33	1,441,155	2	78,931	35	1,520,086
60 - 64	38	1,391,310	2	73,634	40	1,464,944
65 - 69	36	1,297,553	4	97,083	40	1,394,636
70 - 74	24	855,404	2	52,184	26	907,588
75 - 79	29	721,402	1	21,004	30	742,406
80 - 84	8	178,807			8	178,807
85 - 89	15	263,627	3	35,367	18	298,994
90 & Over	16	161,440	1	7,931	17	169,371
Totals	207	\$6,645,785	19	\$524,118	226	\$7,169,903

The benefits for two ex-spouses in receipt of DRO benefits effective in the December 31, 2017 are included with the member's benefits in the above schedule.

Also included in the valuation are 10 deferred members that are not shown in the table above and two members with pending benefits or refunds.

Comparative Statement

Valuation Date December 31	Active Members	Active Members in Valuation				
		Valuation Payroll	Average			% Inc.
			Age	Service	Pay	
1997	189	\$ 8,519,683	41.7	11.0	\$ 45,078	4.8%
1998	199	9,023,188	41.9	11.1	45,343	0.6%
1999	202	9,335,616	41.5	10.7	46,216	1.9%
2000	211	10,383,761	41.8	11.0	49,212	6.5%
2001	209	10,768,665	42.4	11.7	51,525	4.7%
2002	204	10,783,586	42.0	11.9	52,861	2.6%
2003	188	10,539,218	42.1	11.9	56,060	6.1%
2004	185	10,635,766	42.4	12.3	57,491	2.6%
2005	157	9,358,177	41.7	10.9	59,606	3.7%
2006	148	9,037,043	42.2	11.6	61,061	2.4%
2007	148	8,817,298	41.1	10.8	59,576	(2.4)%
2008	136	9,123,164	40.3	10.5	67,082	12.6%
2009	138	9,205,906	40.9	11.1	66,709	(0.6)%
2010	117	7,660,963	39.9	11.4	65,478	(1.8)%
2011	103	7,088,572	40.4	12.2	68,821	5.1%
2012	92	6,801,883	41.0	13.0	73,934	7.4%
2013	85	5,794,143	41.6	13.4	68,166	(7.8)%
2014	85	5,250,588	41.8	13.6	61,772	(9.4)%
2015	87	5,846,208	42.4	14.3	67,198	8.8%
2016	90	6,205,866	42.7	14.6	68,954	2.6%
2017	89	6,306,637	42.6	14.6	70,861	2.8%

Active Members Added to and Removed from Rolls

Year Ended December 31	Added During Year		Terminations During Year								Active Members End of Year
	A	E*	Normal Retirement		Disability Retirement		Died-in- Service		Withdrawal		
			A	E	A	E	A	E	A	E	
2013	1	5	1	0.8	0	0.4	0	0.1	7	1.2	85
2014	5	3	1	0.3	1	0.4	0	0.1	3	1.0	85
2015	2	0	0	1.3	0	0.4	0	0.1	0	1.0	87
2016	4	1	0	1.7	1	0.4	0	0.1	0	1.0	90
2017	3	1	3	2.6	1	0.5	0	0.1	0	1.0	89
5-Year Totals	15	10	5	6.7	3	2.1	0	0.5	10	5.2	

* Reflects Police & Fire only, since General group is closed to new hires.

A = Actual

E = Expected

Active Members – December 31, 2017 by Attained Age and Years of Service General, Court, and Water Department

Attained Age	Years of Service to Valuation Date							No.	Valuation Payroll
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus		
40-44				7	1			8	\$ 445,478
45-49				4	2	1		7	455,927
50-54				2	3			5	297,738
55-59				2				2	123,774
61			1					1	53,709
Totals			1	15	6	1		23	\$ 1,376,626

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

Age: 47.9 years
Service: 19.0 years
Pay: \$59,853

Active Members – December 31, 2017 by Attained Age and Years of Service Police and Fire Members

Attained Age	Years of Service to Valuation Date							No.	Valuation Payroll
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus		
20-24	4							4	\$ 170,266
25-29	5							5	239,740
30-34	2	3	4					9	603,323
35-39	3	1	6					10	676,291
40-44	1	2	2	3				8	626,460
45-49		1	2	8	10			21	1,845,364
50-54			1	2	6			9	768,567
Totals	15	7	15	13	16			66	\$ 4,930,011

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

Age: 40.7 years
Service: 13.0 years
Pay: \$74,697

Development of Funding Value of Assets

Year Ended December 31:	2015	2016	2017	2018	2019	2020
Assumed Investment Return	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
A. Funding Value Beginning of Year	\$80,950,032	\$84,328,560	\$86,899,638			
B. Market Value End of Year	82,569,087	83,408,540	92,425,850			
C. Market Value Beginning of Year	85,837,172	82,569,087	83,408,540			
D. Non-Investment Net Cash Flow	(3,839,555)	(3,777,343)	(4,049,807)			
E. Investment Income						
E1. Market Total: B - C - D	571,470	4,616,796	13,067,117			
E2. Amount for Immediate Recognition	5,532,118	5,770,792	5,941,231			
E3. Amount for Phased-In Recognition: E1-E2	(4,960,648)	(1,153,996)	7,125,886			
F. Phased-In Recognition of Investment Income						
F1. Current Year: 0.25 x E3	(1,240,162)	(288,499)	1,781,472			
F2. First Prior Year	(145,279)	(1,240,162)	(288,499)	\$ 1,781,472		
F3. Second Prior Year	2,251,571	(145,279)	(1,240,162)	(288,499)	\$ 1,781,472	
F4. Third Prior Year	819,835	2,251,569	(145,277)	(1,240,162)	(288,499)	\$ 1,781,470
F5. Total Recognized Investment Gain	1,685,965	577,629	107,534	252,811	1,492,973	1,781,470
G. Total Return Recognized this Year: E2 + F5	7,218,083	6,348,421	6,048,765			
H. Preliminary Funding Value End of Year: A + D + G	84,328,560	86,899,638	88,898,596			
H1. 125% of Market Value End of Year:	103,211,359	104,260,675	115,532,313			
H2. 75% of Market Value End of Year:	61,926,815	62,556,405	69,319,388			
H3. Funding Value End of Year: H, but not greater than H1, nor less than H2	84,328,560	86,899,638	88,898,596			
I. Difference between Market & Funding Value: B-H3	(1,759,473)	(3,491,098)	3,527,254	3,274,443	1,781,470	
J. Recognized Rate of Return	9.1%	7.7%	7.1%			
K. Market Value Rate of Return	0.7%	5.7%	16.1%			
L. Ratio of Funding Value to Market Value	102.1%	104.2%	96.2%			

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed 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 investment income are exactly equal for 3 consecutive years, the Funding Value will become equal to Market Value.

Allocation of Funding Value of Assets as of December 31, 2017

	<u>General, Water, and Court</u>	<u>Police & Fire</u>	<u>Total</u>
A. Funding Value at Beginning of Year	\$28,577,322	\$58,322,316	\$86,899,638
B. Contributions			
B1. Member	114,532	333,600	448,132
B2. Employer	1,278,468	1,380,540	2,659,008
B3. Total = B1+B2	1,393,000	1,714,140	3,107,140
C. Disbursements*	2,623,737	4,533,210	7,156,947
D. Non-investment cash flow = B3-C	(1,230,737)	(2,819,070)	(4,049,807)
E. Average Asset Value During Year = A+(D/2)	27,961,954	56,912,781	84,874,735
F. Ratio	32.94%	67.06%	100.00%
G. Allocation of Investment Return	1,992,463	4,056,302	6,048,765
H. Funding Value at End of Year = A+D+G	\$29,339,048	\$59,559,548	\$88,898,596

* Actual Disbursements made during the year are not reported by division. The allocation shown is estimated based on retirement benefits and refunds as reported on the valuation date in the census data.

Summary of Current Asset Information

Balance Sheet

Current Assets (Funding Value*)		Reserves for	
Cash	\$ 0	Employees' Contributions	\$ 7,046,141
Receivables	217,961	Employer Contributions	42,410,292
Short-Term Investments	1,409,896	Retired Benefit Payments	33,166,376
Common Stock	66,373,232	Undistributed Investment Income	9,803,041
Bonds	21,146,054	Market Value Adjustment	(3,527,254)
Other	3,278,707		
Market Value Adjustment	(3,527,254)		
Valuation	<u>\$88,898,596</u>	Total Reserves	<u>\$88,898,596</u>

* Market Value of assets was reported to be \$92,425,850 (see page B-13).

Revenues and Expenditures

	2017	2016
Balance - January 1,	\$86,899,638	\$84,328,560
Revenues		
Employees' Contributions	448,132	512,597
Employer Contributions	2,659,008	2,641,242
Recognized Investment Income	6,240,447	6,541,491
Total	<u>9,347,587</u>	<u>9,695,330</u>
Expenditures		
Benefit Payments	7,156,947	6,931,182
Refund of Member Contributions	0	0
Administrative and Investment Expenses	191,682	193,070
Total	<u>7,348,629</u>	<u>7,124,252</u>
Balance - December 31,	<u>\$88,898,596</u>	<u>\$86,899,638</u>
Ratio of Net Investment Income to Mean Assets	7.1 %	7.7 %

SECTION C

VALUATION PROCEDURES

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 Employees 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.”

The Retirement System meets this constitutional requirement by having the following **Financial Objective: To establish and receive contributions, expressed as percents of member payroll, which will remain approximately level from year to year** and 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 actuarial present 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:

$$B = C + I - E$$

Benefit payments to any group of members and their beneficiaries cannot exceed the sum of:

Contributions received on behalf of the group

. . . plus . . .

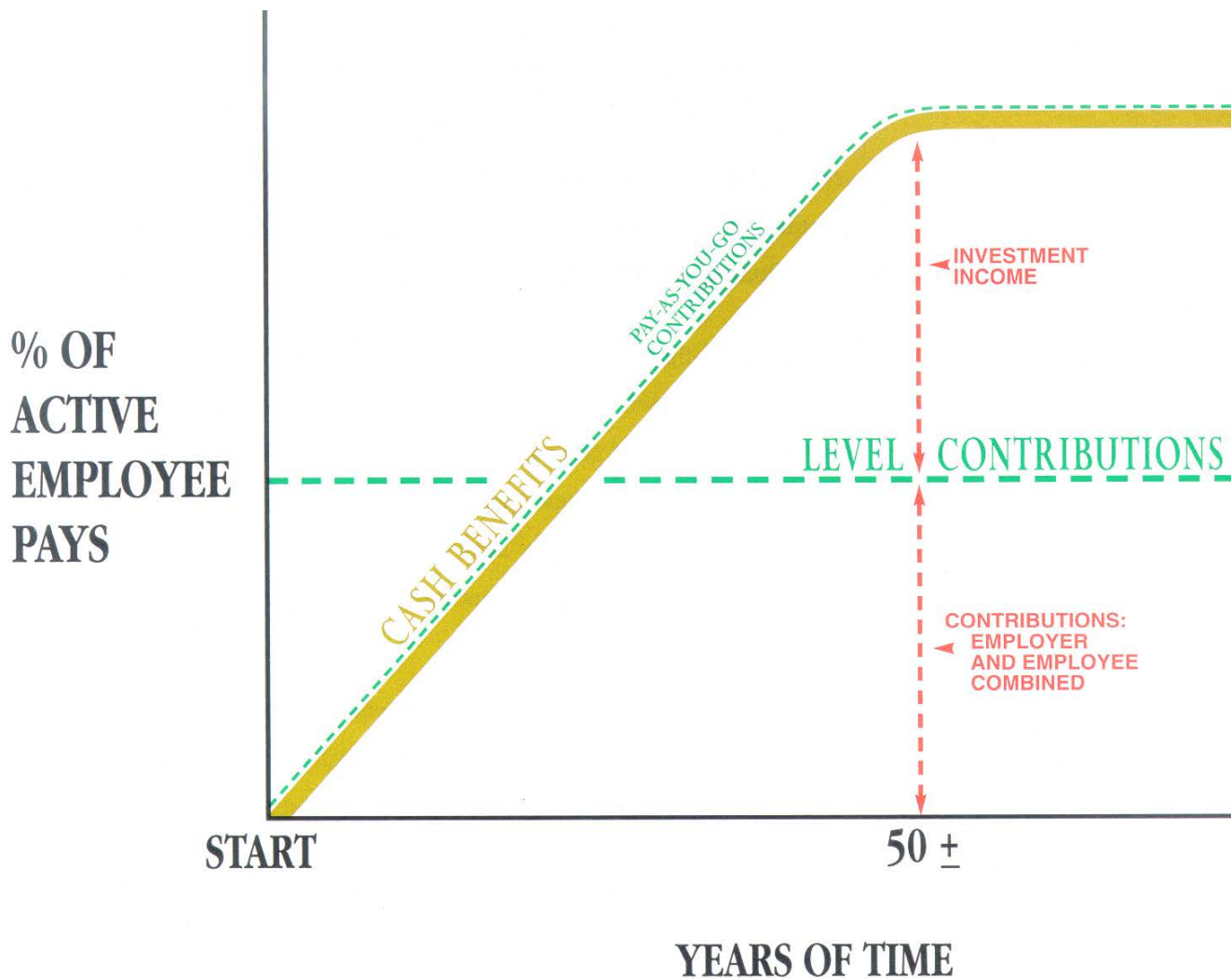
Investment earnings received and not required for immediate payment of benefits

. . . minus . . .

Expenses of operating the program.

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets. **Investment income on invested assets becomes the major contributor to the retirement program**, and the amount is directly related to the amount of contributions and investment performance.

Computed Contribution Rate Needed To Finance Benefits. From a given schedule of benefits and from the data furnished, the contribution rate is calculated *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:

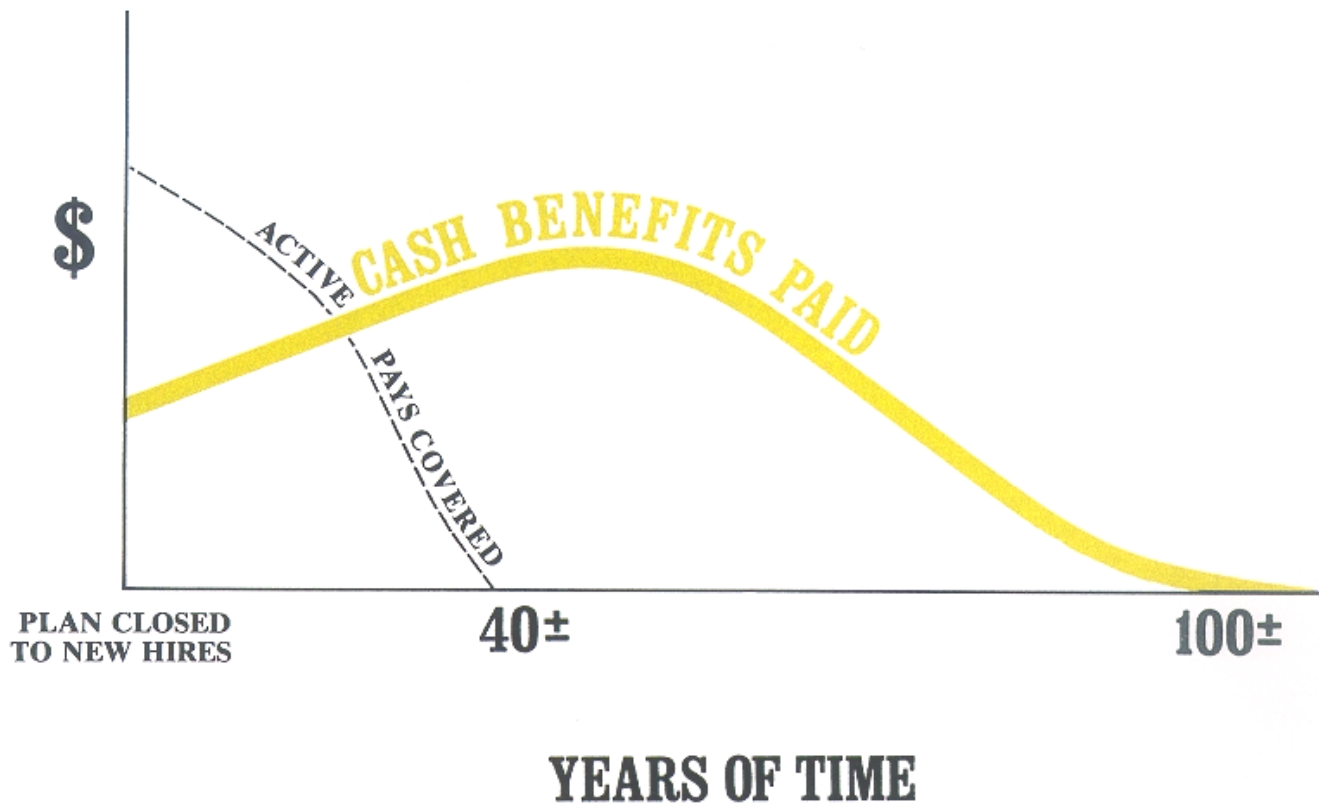
Economic Risk Areas

- 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

A CLOSED PENSION PLAN

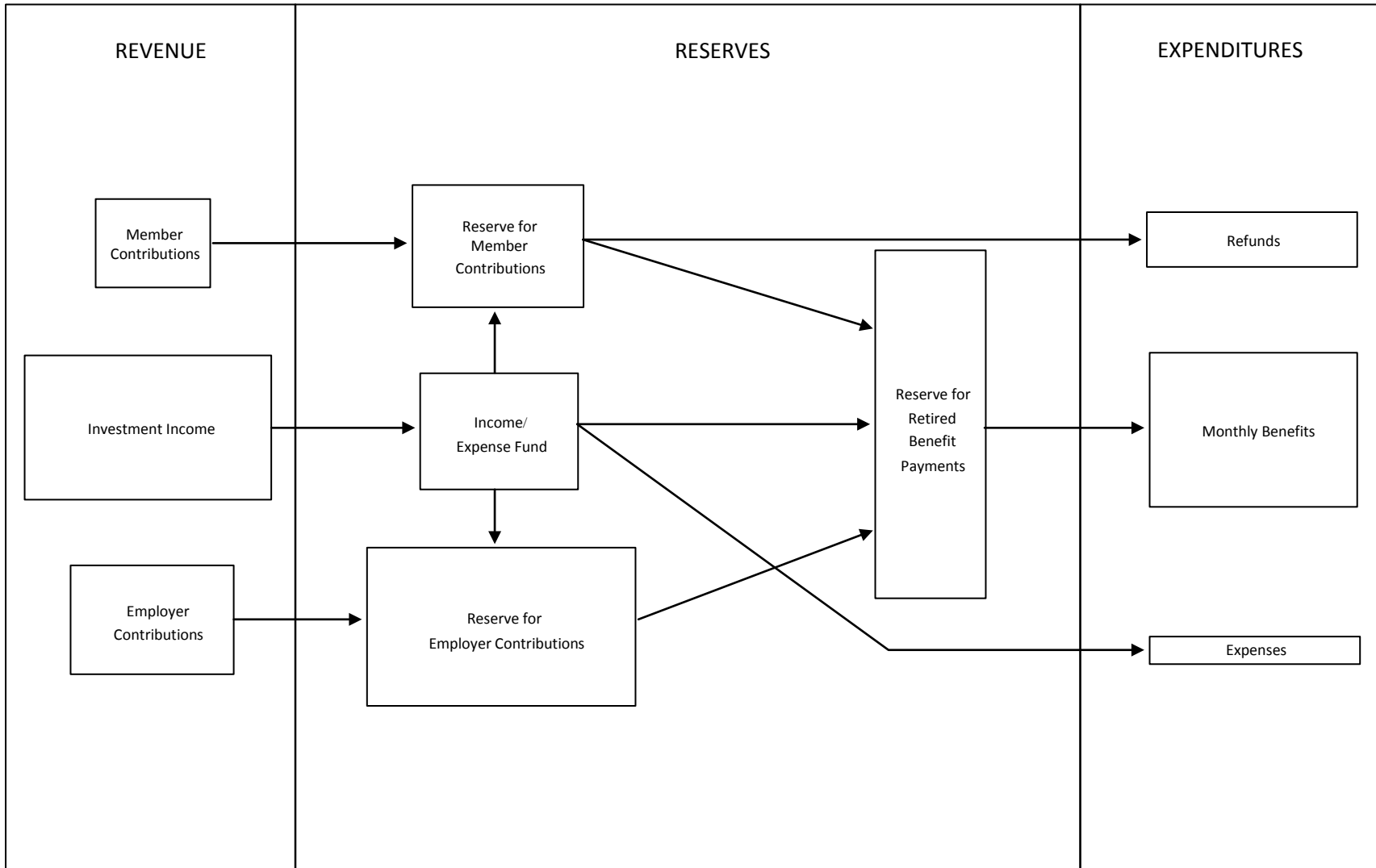


A plan becomes closed when no new hires are admitted to active membership. The persons covered by the plan at the time of closing continue their normal activities and continue to be covered by the plan, until the last survivor dies.

CASH BENEFITS LINE. After a pension plan becomes closed, the usual pattern is for cash benefits to continue to increase for decades of time. Eventually the cash benefits will peak, and then gradually decrease over more decades of time, ultimately to zero. The last cash benefit is likely to occur a century after the time the plan is closed.

The precise amounts of cash benefits cannot be known now, and must be estimated by assumptions of future experiences in a variety of financial risk areas.

Flow of Money Through the Retirement System



Actuarial Methods

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

- (i) 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 portion of the value of the member's benefit at the time of retirement; and
- (ii) Each annual normal cost is a constant percentage of the member's year-by-year projected covered pay. For funding purposes, the normal cost is based on the benefits in effect in the year of service rendered.

Financing of Unfunded Actuarial Accrued Liabilities. Unfunded actuarial accrued liabilities were amortized by level percent-of-payroll (principal and interest combined) over a period of 21 future years for Police and Fire (starting amortization period of 25 years), and as a level dollar amount over a period of 15 future years for General, Water Department and Court Members (starting amortization period of 20 years). Police and Fire payroll is assumed to grow with wage inflation. General, Water Department and Court payroll is assumed to decline as the closed population decreases. Amortization rates are developed by projecting the unfunded actuarial accrued liabilities to the beginning of the fiscal year for which rates are determined.

Asset Valuation Method. The prior year's valuation assets are increased by contributions and reduced by refunds and benefit payments. An amount equal to the assumed investment return net of expenses for the year is then added. Differences between actual return on a market value basis and an assumed return are phased-in over a four-year period. Valuation assets are restricted to a range of 75% to 125% of Market Value of Assets. Valuation assets are allocated based on actual contributions and estimated disbursements by member classification.

Actuarial Assumptions Used for the Valuation

The contribution requirements and benefit values of the System are calculated by applying actuarial assumptions to the benefit provisions and census data furnished, using the actuarial cost methods described on the previous page.

The rationale for the actuarial assumptions is as follows.

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

- Long-term rates of investment return to be generated by the assets of the System.
- Patterns of pay increases to members.
- Rates of mortality among members, retirees and beneficiaries.
- Rates of withdrawal of active members (without entitlement to a retirement benefit).
- Rates of disability among members.
- The age patterns of actual retirements.

The monetary effect of each assumption is calculated for the length of time for which each present covered person survives.

Actual experience of the System will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations). Actuarial assumptions were last reviewed and updated based on a report issued December 11, 2014 and adopted by the Board January 14, 2015 for use in the December 31, 2014 actuarial valuation. The rationale for the actuarial assumptions is included in the report issued December 11, 2014.

All actuarial assumptions are estimates of future experience, not market measures.

Valuation Assumptions

The rate of investment return is 7.0% (net of expenses) per year, compounded annually. This assumption is used to make money payable at one point in time equal in value to an amount of money payable at another point in time. The assumed real rate of return (the net return in excess of the wage inflation rate) is 4.0%.

The wage inflation assumption is 3.0%.

The price inflation assumption is 2.5% (not explicit in the valuation).

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

	Year Ended December 31,					Average
	2017	2016	2015	2014	2013	
1) Nominal rate of return [#]	7.1 %	7.7 %	9.1 %	9.5 %	10.6 %	8.8 %
2) Increase in CPI	2.1 %	2.1 %	0.7 %	0.8 %	1.5 %	1.4 %
3) Average salary increase	2.8 %	2.6 %	8.8 %	(9.4)%	(7.8)%	(0.8)%
4) Spread between recognized return and average salary increase						
Actual						9.6%
Assumed						4.0%*

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.

* 3.5% during 2013.

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 (Economic)	Increase Next Year
20	3.8%	3.0%	6.8%
25	3.6%	3.0%	6.6%
30	2.8%	3.0%	5.8%
35	2.3%	3.0%	5.3%
40	1.9%	3.0%	4.9%
45	1.5%	3.0%	4.5%
50	1.1%	3.0%	4.1%
55	0.7%	3.0%	3.7%
Ref	93		

If the number of active members remains constant, then the total active member payroll will increase 3.0% annually, the base portion of the individual salary increase assumptions.

The mortality table used to measure post-retirement mortality is the RP-2014 Healthy Annuitant Mortality Table for males and females projected five years to 2019, with MP-2014. The provision for future mortality improvement is the projection to 2019. Sample values follow:

Sample Attained Ages	Single Life Retirement Values					
	Present Value of \$1 Monthly for Life		Percent Dying Next Year		Future Life Expectancy (Years)	
	Men	Women	Men	Women	Men	Women
55	\$137.11	\$141.85	0.5328%	0.3471%	28.92	31.44
60	129.40	134.62	0.7387%	0.4918%	24.73	27.02
65	119.79	125.47	1.0439%	0.7430%	20.70	22.74
70	108.05	114.22	1.5588%	1.1702%	16.85	18.67
75	94.16	100.88	2.4452%	1.9042%	13.26	14.86
80	78.51	85.68	4.0602%	3.1777%	10.01	11.41
Ref:	1208 x 1.00 sb 0	1209 x 1.00 sb 0				

For pre-retirement mortality, the RP-2014 Employee Mortality Table for males and females projected to 2019 with MP-2014 is used. Ten percent of pre-retirement deaths were assumed to be duty related. The RP-2014 Disabled Retiree Mortality Table projected to 2019 with MP-2014 is used for current disability retirees for projecting disability costs.

Published mortality tables have been extended to high and low ages using a cubic spline method.

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

Retirement Ages	General, Water & Court	Retirement Ages	Police & Fire
		52	40%
53	25%	53	40%
54	25%	54	40%
55	25%	55	40%
56	25%	56	40%
57	25%	57	40%
58	25%	58	40%
59	25%	59	40%
60	30%	60+	100%
61	40%		
62	50%		
63	60%		
64	70%		
65	80%		
66+	100%		
Ref	1395		2160

In addition to the retirement probabilities shown above, it was assumed that at least 50% of remaining eligible members would retire upon accruing the maximum pension of 75% of FAC. Furthermore, for Police groups, it was assumed the rates of retirement would double (to a max of 100%) after hitting the dollar benefit max (\$80,000 or \$70,000 depending on group). Also, Fire members hired on or after January 1, 2013 are assumed to retire at a rate of 60% upon first (age) eligibility at age 55.

Rates of separation from active membership are represented by the following table (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	
		General, Water & Court	Police & Fire
ALL	0	9.00%	N/A
	1	9.00%	
	2	8.00%	
	3	8.00%	
	4	5.50%	
20	5 & Over	5.00%	3.50%
25		5.00%	3.50%
30		4.50%	2.90%
35		3.55%	1.50%
40		1.45%	0.60%
45		0.75%	0.50%
50		0.75%	0.50%
55		0.75%	0.50%
Ref		337	1
		55	54

This assumption measures the probabilities of members remaining in employment. The rates do not apply to members eligible to retire and do not include separation on account of disability.

Rates of disability were as follows:

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Men	Women
20	0.15%	0.15%
25	0.18%	0.18%
30	0.20%	0.20%
35	0.29%	0.29%
40	0.42%	0.42%
45	0.65%	0.65%
50	1.05%	1.05%
55	1.84%	1.84%
Ref	16	16

Miscellaneous and Technical Assumptions

December 31, 2017

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:	Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and turnover do not operate during retirement eligibility.
Liability Adjustments:	<p>Age and Service Retirement Present Values were adjusted by 3% for Police and Fire members (excluding Sergeants and Lieutenants) hired before December 16, 2008 and 9% for Police and Fire Chiefs hired before December 16, 2008 to account for the additional amount included in the FAC due to unused sick leave and unused vacation time.</p> <p>Police and Fire Actuarial Accrued Liabilities were increased by 2% to account for FAC calculations using pay prior to pay cuts.</p> <p>Police hired after December 16, 2008 and Firefighters hired after July 1, 2008 were given no adjustment.</p> <p>Age and Service retirement present values were adjusted by 3% to account for annuity withdrawal, with the exception of Police hired after December 16, 2008 and Firefighters hired after July 1, 2008.</p> <p>A 0.43% load was added to the Normal Cost to reflect Military Service Purchases for General, Water Department, and Court members.</p>

Miscellaneous and Technical Assumptions (Continued)

December 31, 2017

Data Assumptions:	There were two members whose payment status was undetermined as of the December 31, 2017 valuation. One of the members was valued as receiving a retirement benefit and the other was valued as receiving a deferred retirement benefit. Estimated liability for these members was adjusted by 20% to reflect data uncertainty.
Option Factors:	Option factors are based upon 7.0% interest and the RP-2014 Healthy Annuitant Mortality Table projected 5 years to 2019 with a 90% Unisex Blend. General, Water and Court members are assumed to elect straight life annuities. 90% of Police and Fire Chiefs, Lieutenants and Sergeants hired before July 2008 are assumed to elect unreduced 70% Joint and Survivor.
Incidence of Contributions:	Contributions are assumed to be received each month throughout the year based upon the computed monthly dollar amount shown in this report.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Deferred Retirement:	Terminated members with a vested benefit are assumed to retire at first eligibility for voluntary retirement.

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 “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 “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.

Pensions in an Inflationary Environment

Value of \$1,000/month Retirement Benefit to an Individual Who Retires at Age 55 in an Environment of 2.5% Inflation

Age	Inflation Rate
	2.5%
55	\$1,000
56	976
57	952
58	929
59	906
60	884
65	781
70	690
75	610
80	539
85	477

The life expectancy of a 55-year-old male retiree is to age 84. The life expectancy for a 55-year-old female retiree is to age 86. Half of the people will outlive their life expectancy. The effects of even moderate amounts of inflation can be significant for those who live to an advanced age.

SECTION D

ADDITIONAL DISCLOSURE INFORMATION

GASB Statement Nos. 67 and 68 are the accounting standards which replaced GASB Statement Nos. 25 and 27. GASB Statement No. 67 is first effective for fiscal year 2014 and GASB Statement No. 68 is first effective for fiscal year 2015. A separate GASB Statement Nos. 67 and 68 report is issued outside of this report. This section contains historical GASB Statement Nos. 25 and 27 reporting information for prior fiscal years and illustrative information for fiscal years 2015 and later.

Statement of Market Value of Plan Net Assets as of December 31

	2017	2016
Assets:		
Cash and short-term investments	\$ 1,627,857	\$ 1,909,254
Bonds	21,146,054	19,864,002
Stocks	66,373,232	58,535,359
Other	3,278,707	3,099,925
Total Assets	92,425,850	83,408,540
Liabilities		
Payables	0	0
Net assets held in trust for pension benefits*	\$92,425,850	\$83,408,540

* A schedule of funding progress for the plan is presented on page D-4.

Statement of Changes in Plan Net Assets for the Fiscal Years Ended December 31

	2017	2016
Additions:		
Contributions		
Employer	\$ 2,659,008	\$ 2,641,242
Plan members	448,132	512,597
Total	3,107,140	3,153,839
Investment Income	13,258,799*	4,803,861*
Total Additions	16,365,939	7,957,700
Deductions:		
Benefits	7,156,947	6,931,182
Refunds of contributions	0	0
Expenses	191,682	187,065
Total Deductions	7,348,629	7,118,247
Net Increase	9,017,310	839,453
Net assets held in Trust Fund:		
Beginning of year	83,408,540	82,569,087
End of year	92,425,850	83,408,540

* Estimated based on reported financial transactions and beginning and end of year market values.

Plan Description. The City of Allen Park Employees Retirement System is a single-employer defined benefit pension plan that covers employees of the City of Allen Park.

The plan provides retirement, disability, and death benefits to plan members and their beneficiaries.

Contributions. Effective July 1, 2015, Police members contribute 7% of annual salary.
 Effective July 1, 2015, General members contribute 7% of annual salary.
 Effective July 1, 2013, Fire members contribute 7% of annual salary.

The employer’s funding policy provides for periodic employer contributions based upon a **fundamental financial objective of having rates of contribution which remain relatively level from generation to generation of the City of Allen Park citizens.** To determine the employer contribution rates and to assess the extent to which the fundamental financial objective is being achieved, the System has actuarial valuations prepared annually. In preparing these valuations, the entry age actuarial cost method is used to determine normal cost and actuarial accrued liabilities. The amortization of the unfunded actuarial accrued liability is determined as a level percentage of payroll for Police and Fire, consistent with the financing objective. The amortization of the unfunded actuarial accrued liability is determined as a level dollar amount for General, Water and Court since those groups are closed to new hires.

Unfunded actuarial accrued liabilities (full funding credit) are amortized by level percent-of-payroll contributions over a period of 21 future years for Police and Fire members (starting amortization period of 25 years), and level dollar amounts over a period of 15 remaining years for General, Water Department and Court members (starting amortization period of 20 years).

On the basis of the December 31, 2017 actuarial valuation, the employer rates for the fiscal year beginning July 1, 2018 were determined to be as follows:

<u>Contributions for</u>	<u>Percents of Covered Active Member Payroll</u>
Normal Cost	12.65 %
Accrued Liabilities	28.47 %
Total Employer Rate	41.12 %

Schedule of Funding Progress (Dollar Amounts in Millions)

Actuarial Valuation 12/31	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a Percent of Covered Payroll [(b)-(a)]/(c)
1998*	\$ 56.2	\$ 48.7	\$ (7.5)	115.4 %	\$ 9.0	- %
1999*	62.3	54.6	(7.7)	114.1	9.3	-
2000	67.9	58.8	(9.1)	115.5	10.4	-
2001* [@]	71.9	62.9	(9.0)	114.3	10.8	-
2002*	72.4	68.1	(4.3)	106.3	10.8	-
2003	73.5	73.4	(0.1)	100.1	10.5	-
2004*	76.1	76.8	0.7	99.1	11.0	6.4
2005	77.8	82.9	5.1	93.8	9.8	52.0
2006	81.9	86.3	4.4	94.9	9.3	47.3
2007*	84.0	90.2	6.2	93.1	8.9	69.7
2008	79.5	96.0	16.5	82.8	9.1	181.3
2009	77.1	97.7	20.6	78.9	9.2	224.4
2010 [@]	74.7	98.7	24.0	75.7	7.7	313.5
2011	70.1	99.8	29.7	70.2	7.1	419.4
2012	72.8	101.3	28.5	71.8	6.8	419.6
2013*	75.4	99.8	24.4	75.6	5.8	421.0
2014* [@]	81.0	104.4	23.4	77.6	5.3	446.0
2015* [@]	84.3	107.2	22.9	78.6	5.8	391.1
2016* [@]	86.9	108.4	21.5	80.2	6.2	346.4
2017*	88.9	110.3	21.4	80.6	6.3	339.5

[@] Revised actuarial assumptions or methods.

* Retirement System benefits amended.

Schedule of Employer Pension Contributions

Year Ended December 31	Actuarially Determined Contribution*
2008	\$1,962,336
2009	2,545,881
2010	3,177,149
2011	2,971,831
2012	4,032,657#
2013	3,334,274@
2014	2,302,748^
2015	2,699,151
2016	2,641,242
2017	2,659,008

* Since it was reported to the actuary that the City's practice is to contribute the monthly dollar amounts shown on page A-2 in the actuarial valuation report, the actuarially determined contributions shown in the Schedule of Employer Contributions are the actual contributions made by the City in the plan year.

The City reported actual employer contributions of \$2,758,177 for the year ending December 31, 2012. The Actuarially Determined Contribution shown is based on the reported amount of unpaid contributions totaling \$1,274,480.

@ Based on our understanding of City procedure (see footnote above), we estimate that the Actuarially Determined Contribution was \$3,334,274. The City reported actual employer contributions of \$1,719,721 for the year ending December 31, 2013.

^ Based on our understanding of City procedure (see footnote above), we estimate that the Actuarially Determined Contribution was \$2,302,748. The City reported actual employer contributions of \$5,028,314 for the year ending December 31, 2014.

Summary of Actuarial Methods and Assumptions

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	December 31, 2017
Actuarial cost method	Entry Age
Amortization method	
General (AFSCME)	Level dollar, closed
Police & Fire	Level percent, closed
Remaining amortization period	
General (AFSCME)	15 years (out of 20)
Police & Fire	21 years (out of 25)
Asset valuation method	4-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.0%
Projected salary increases*	3.0% - 6.8%
Cost-of-living adjustments	N/A
Payroll Growth	3.0%
Group Size – General	Closed Population
Group Size – Police & Fire	Stable Population
<hr/>	
*Includes price inflation at	2.5%

SECTION E

FUNDING POLICY

**CITY OF ALLEN PARK
EMPLOYEES RETIREMENT SYSTEM**

ACTUARIAL FUNDING POLICY

WHEREAS, the City of Allen Park Employees Retirement System (“Retirement System”) is established and administered pursuant to the City of Allen Park Charter, as amended, the Retirement System Ordinance, as amended, 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 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 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. The Board's current smoothing method uses a four (4) year valuation period.

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 for the stable population of Police & Fire members. The Board's current amortization method for Police & Fire members is a closed 25-year level percent amortization period ending June 30, 2039.
- (2) A level dollar amount amortization method shall be used to systematically pay off the unfunded actuarial accrued liabilities over a closed amortization period determined by the Board in consultation with its actuary for the closed population of General, Water Department and Court members. The Board's current amortization method for General, Water Department and Court members is a closed 20-year level dollar amortization ending June 30, 2033.
- (3) Unfunded liabilities associated with benefit changes or assumption changes shall be funded over a period determined by the Board in consultation with its actuary.

- (4) 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 determined by the Board in consultation with its actuary.
- (5) 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, subject to the following limitations:
 - (a) The assumed rate of investment return shall not exceed 8.0%, compounded annually;

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 60%, 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 by the Retirement System's actuary 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 in the Board's discretion.

B. Amendment

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