

City of St. Clair Shores Employees Retirement System

65th Actuarial Valuation Report
as of June 30, 2017



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October 4, 2017

Retirement Board
City of St. Clair Shores
Employees Retirement System
St. Clair Shores, Michigan

**Re: City of St. Clair Shores Employees Retirement System Actuarial Valuation as of June 30, 2017
Actuarial Disclosures**

Dear Board Members:

The results of the June 30, 2017 Annual Actuarial Valuation of the City of St. Clair Shores Employees Retirement System are presented in this report.

This report was prepared at the request of the Board and is intended for use by the 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 as of June 30, 2017, 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.

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 valuation was based upon information furnished by the Plan Administrator, 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 Plan Administrator.

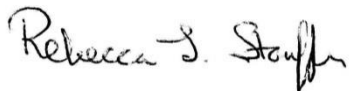
In addition, this report was prepared using certain assumptions approved by the Board as described in the section of this report entitled Valuation Methods and Assumptions.

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 St. Clair Shores Employees Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation report with the Board of Trustees and answer any questions pertaining to the valuation. Rebecca L. Stouffer and Mark Buis 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 actuaries are independent of the plan sponsor.

Respectfully submitted,



Rebecca L. Stouffer, ASA, MAAA



Mark Buis, FSA, FCA, EA, MAAA

RLS/MB:mrB

SECTION A

VALUATION RESULTS

Funding Objective

The funding objective of the Retirement System is to establish and receive sufficient contributions which will accumulate assets during each member's working years which, together with investment income, will be sufficient to pay promised benefits after retirement.

Contributions

The Retirement System is supported by member contributions, City's 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 costs allocated to the current year by the actuarial cost methods described in Section C (the normal cost); and
- (2) finance over a period of future years the actuarial cost not covered by present assets and anticipated future normal costs (unfunded actuarial accrued liability).

Contribution requirements for the fiscal year beginning July 1, 2018 are shown on page A-2.

The Board of Trustees of the City of St. Clair Shores Employees Retirement System confirms that the System provides for payment of the required employer contribution as described in Section 20m of Michigan Public Act No. 728.

City's Computed Contributions

Contributions for	For Fiscal Year Beginning July 1,	
	2018	2017
NORMAL COST		
Age and service pensions	\$ 418,888	\$ 442,687
Death before retirement pensions	13,376	14,136
Disability pensions	25,696	26,784
Total	457,960	483,607
MEMBERS' CONTRIBUTIONS		
Gross contributions	30,273	31,993
Less prospective refunds	3,872	4,092
Available for pensions	26,401	27,901
CITY'S NORMAL COST	431,559	455,706
AMORTIZATION OF UNFUNDED		
ACTUARIAL ACCRUED LIABILITIES[#]	\$2,248,480	\$2,188,608
TOTAL CITY CONTRIBUTIONS ^{*^}	\$2,680,039	\$2,644,314

[#] *Unfunded actuarial accrued liabilities were financed as a level dollar amount over a period of 24 years (25 years for the fiscal year beginning July 1, 2017).*

^{*} *Contribution amounts for prior fiscal years are shown on page A-7.*

[^] *The estimated contribution as a percentage of payroll for the fiscal year beginning July 1, 2018 is 76.1%. This estimated contribution is for informational purposes only and is based on projected payroll of \$3,520,068. The Plan is closed to new hires and it is our understanding the City makes contributions on the dollar basis noted above. To the extent that actual payroll is different, the actual percentage will vary.*

Determination of Unfunded Actuarial Accrued Liability

	June 30,	
	2017	2016
A. Accrued Liability		
1. For retirees and beneficiaries	\$ 45,848,265	\$ 45,222,536
2. For vested terminated members	2,125,129	2,109,071
3. For present active members		
a. Value of expected future benefit payments	21,146,160	21,289,811
b. Value of future normal costs	2,952,537	3,177,151
c. Active member accrued liability: (a) - (b)	18,193,623	18,112,660
4. Total accrued liability	66,167,017	65,444,267
B. Present Assets (Funding Value)	40,232,995	39,907,111
C. Unfunded Accrued Liability: (A.4) - (B)	25,934,022	25,537,156
D. Funding Ratio: (B) / (A.4)	60.8%	61.0%
E. Funding Ratio: Market Value Basis	59.1%	55.9%

Development of Funding Value of Assets

Year Ended June 30:	2016	2017	2018	2019	2020
A. Funding Value Beginning of Year	\$39,768,186	\$39,907,111			
B. Market Value End of Year	36,607,467	39,096,042			
C. Market Value Beginning of Year	39,230,459	36,607,467			
D. Non-Investment Net Cash Flow	(2,194,574)	(2,212,273)			
E. Investment Income					
E1. Market Total: B - C - D	(\$428,418)	4,700,848			
E2. Assumed Rate of Investment Return	8.00%	7.50%			
E3. Amount for Immediate Recognition	3,093,672	2,910,073			
E4. Amount for Phased-In Recognition: E1-E3	(3,522,090)	1,790,775			
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.25 x E4	(880,523)	447,694			
F2. First Prior Year	(718,992)	(880,523)	\$ 447,694		
F3. Second Prior Year	779,907	(718,992)	(880,523)	\$ 447,694	
F4. Third Prior Year	59,435	779,905	(718,990)	(880,521)	\$ 447,693
F5. Total Recognized Investment Gain (Loss)	(760,173)	(371,916)	(1,151,819)	(432,827)	447,693
G. Funding Value End of Year: A + D + E3 + F5	39,907,111	40,232,995			
H. Difference between Market and Funding Value	(3,299,644)	(1,136,953)			
I. Recognized Rate of Return - Funding Value	6.03%	6.54%			
J. Recognized Rate of Return - Market Value	(1.12)%	13.24%			

The Funding Value of Assets recognizes assumed investment income (line E.3) fully each year. Differences between actual and assumed investment income (line E.4) 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 three consecutive years, the Funding Value will become equal to Market Value.

Derivation of Experience Gain (Loss)

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

(1) UAAL* at start of year	\$ 25,537,156
(2) Total normal cost	538,145
(3) Actual contributions for pensions	2,590,466
(4) Interest accrual ((1) + 1/2 [(2)-(3)]) x 7.50%	1,838,325
(5) Expected UAAL* before changes (1) + (2) - (3) + (4)	25,323,160
(6) Change from benefit improvements	0
(7) Change in actuarial assumptions	0
(8) Expected UAAL* after changes (5) + (6) + (7)	25,323,160
(9) Actual UAAL*	25,934,022
(10) Gain (Loss) (8) - (9)	(610,862)
(11) Gain (Loss) as percent of actuarial accrued liabilities at start of year (\$65,444,267)	(0.9)%

* *Unfunded Actuarial Accrued Liabilities.*

Valuation Date	Experience Gain (Loss) as % of Beginning Accrued Liability
6-30-10	(7.1) %
6-30-11	(6.1)
6-30-12	(4.1)
6-30-13	(0.4)
6-30-14	0.8
6-30-15	(2.3)
6-30-16	(1.3)
6-30-17	(0.9)

Comparative Schedule and Risk Factors

Valuation Date	Actuarial Accrued Liabilities & Reserves	Valuation Assets	Percent Funded	Unfunded Actuarial Accrued Liabilities & Reserves		City's Contribution Rate	Covered Payroll
				Dollars	Amortization Period		
06/30/08	\$55,873,969	\$45,610,111	81.6 %	\$ 10,263,858	25 yrs.	\$1,866,531 #	\$6,647,356
06/30/09	54,466,034	43,364,264	79.6	11,101,770	24	1,812,824 #	6,726,665
06/30/10	55,767,178	41,130,494	73.8	14,636,684	23	2,090,393 *	6,371,328
06/30/11	56,714,374	38,612,848	68.1	18,101,526	22	2,379,350	5,865,873
06/30/12	56,805,539	36,435,503	64.1	20,370,036	21	2,561,038	5,299,757
06/30/13	57,648,592	37,291,564	64.7	20,357,028	20	2,512,506	4,599,115
06/30/14	58,329,977	38,900,248	66.7	19,429,729	19	2,462,821	4,611,639
06/30/15	59,991,212	39,768,186	66.3	20,223,026	18	2,554,204 #	4,282,301
06/30/16	65,444,267	39,907,111	61.0	25,537,156	25	2,644,314 #	4,261,711
06/30/17	66,167,017	40,232,995	60.8	25,934,022	24	2,680,039	4,118,454

* Retirement System amended.

Revised actuarial assumptions and/or methods.

Percent Funded is the Ratio of Valuation Assets to Actuarial Accrued Liabilities. This 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%.

Schedule of Employer Contributions

Fiscal Yr. Ended June 30	Val. Yr. Ended June 30	Computed Dollar Contribution Based on Valuation Payroll	Annual Required Contribution Based on Actual Payroll
2010	2008 #	\$ 1,866,531	\$ 1,866,531
2011	2009 #	1,812,824	1,808,157
2012	2010 *	2,090,393	2,095,060
2013	2011 *	2,379,350	2,379,350
2014	2012	2,561,038	2,561,038
2015	2013	2,512,506	2,512,506
2016	2014	2,462,821	2,462,821
2017	2015 #	2,554,204	2,554,204
2018	2016 #	2,644,314	-
2019	2017	2,680,039	-

* Retirement System amended.

Revised actuarial assumptions and/or methods.

Comments

Actuarial Experience

Retirement System experience during the year ended June 30, 2017 was less favorable than expected, resulting in a loss of \$610,862. The loss was primarily attributable to recognized investment income that was less than assumed and by new retirees joining the rolls earlier than anticipated.

As of June 30, 2017, there are \$1.1 million of unrecognized investment losses that will be gradually recognized over the next three years. Recognition of these losses will put upward pressure on required contributions over the next several years.

Actuarial Disclosure

The computed contribution rate shown on A-2 may be considered as a minimum contribution rate that complies with the Board's funding objective. 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-6, 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 System's financial condition.

Looking Ahead

The current investment return assumption is 7.5%. Due to the closed nature of the System, increasing liquidity needs and lower interest rates on fixed income investments, it may be difficult to achieve this return over the long-term. Additionally, new guidance regarding the selection of economic assumptions has been provided by Actuarial Standards of Practice (ASOP) No. 27. The new standards tighten the range of reasonable assumptions that the actuary is allowed to use with regard to the investment return assumption. The current assumption of 7.5% is at the upper end of the reasonable range. We recommend that consideration be given to lowering this assumption to 7.25% effective with the June 30, 2018 valuation.

Certification

To the best of our knowledge and belief the valuation is complete and accurate and was made in accordance with generally recognized actuarial methods. The actuarial assumptions summarized in Section C are individually and in the aggregate, a reasonable representation of the past and anticipated future experience of the System.

Comments (Concluded)

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 7.5% on the actuarial value of assets), it is expected that:

- 1) Employer normal cost dollar amounts will eventually decrease as active payroll declines due to the closed nature of the plan;
- 2) Amortization payment dollar amounts will remain level over the next 24 years;
- 3) The unfunded actuarial accrued liability will be fully amortized after 24 years; and
- 4) 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 is shown on page A-3.

SECTION B

VALUATION DATA

Brief Summary of Benefit Provisions (June 30, 2017)

Regular Retirement (No reduction factor for age)

Eligibility - Age 50 with 25 years of service, or age 60 with 10 or more years of service.

Annual Amount – AFSCME, Court Non-Union, Court Clerical, and PEA: Total service multiplied by 2.5% of average final compensation with a maximum of 80% of average final compensation.

Dispatchers: Total service multiplied by 2.5% of average final compensation with a maximum of 75% of average final compensation.

AR4: Total service multiplied by 2.5% of average final compensation with a maximum of 62.5% of average final compensation. Maximum benefit for AR4 members cannot exceed base pay as of termination date.

Type of Average Final Compensation - Highest 5 non-consecutive years out of last 10. Court Clerical and Dispatchers – Highest 5 consecutive years out of last 10.

Deferred Retirement (Vested Benefit)

Eligibility - 10 years of service, benefit begins at age 60.

Annual Amount - Computed as regular retirement but based on average final compensation and service at time of termination.

Duty Disability Retirement

Eligibility - No age or service requirement.

Annual Amount - Computed as regular retirement with a minimum benefit of 20% of average final compensation. Upon termination of worker's compensation or age 60, whichever occurs first, benefit is recomputed to include additional service credit for the period worker's compensation was paid.

Non-Duty Disability Retirement

Eligibility - 10 or more years of service.

Annual Amount - Computed as regular retirement.

Death-in-Service Survivor Pension

Eligibility - 10 years of service.

Annual Amount - Computed as regular retirement but actuarially reduced in accordance with a 100% joint and survivor election.

Brief Summary of Benefit Provisions (June 30, 2017) (Concluded)

Post-Retirement Cost-of-Living Adjustments

Retirees effective 7/1/93 (Court Clerical effective 1/1/03): 5% cost-of-living increase at age 60 or five years after retirement, whichever is later, with a second increase of 5% five years after the first increase.

Member Contributions

AR4 and Court Non-Union:	None
AFSCME, Court Clerical, Dispatchers, and PEA:	1.0% of pay

City's Contributions

Actuarially determined amounts which are sufficient to at least cover the requirements of the funding objective stated on page A-1.

New Hires

The Plan is closed. No new hires will participate in this Retirement System.

Summary of Asset Information Furnished for the Valuation Balance Sheet as of June 30, 2017

Current Assets		Reserves for	
Cash & Equivalents	\$ 1,731,837	Employees' Contributions	\$ 596,545
Receivables & Accruals	57,835	Employer Contributions	30,895,784
Bonds	5,126,996	Retired Benefit Payments	6,511,559
Common Stocks	10,228,566	Excess Earnings Reserve	1,092,154
ADR	4,534,596		
Foreign Stocks	819,099		
Real Estate	580,621		
Mortgages	0		
Foreign Gov. & Agencies	0		
Other Fixed Income	2,768,300		
Other Equities	13,355,644		
Other Assets (Securities lending)	1,373,287		
Accounts payable	(63,644)		
Amount due to Broker (Securities lending)	(1,417,095)		
Total Current Assets	\$39,096,042	Total Reserves	\$39,096,042
Market Adjustment*	1,136,953	Market Adjustment*	1,136,953
Total Valuation Assets**	\$40,232,995	Total Valuation Assets**	\$40,232,995

* See page A-4 for derivation of the market adjustment.

** Includes the Excess Earnings Reserve.

Revenues and Expenditures

Balance July 1, 2016	\$39,907,111
Revenues	
Employees' contributions	36,262
Employer contributions	2,554,204
Medicare reimbursement [#]	288,254
Recognized investment income (valuation purposes)	2,538,157
Expenditures	
Benefit payments	4,802,739
Refund of member contributions	0
Medicare payments [#]	288,254
Balance June 30, 2017	<u>\$40,232,995</u>

[#] Medicare payments to retirees are paid monthly by the custodian from the Retirement System's assets. At the end of each quarter, these amounts are reimbursed to the System by the City.

Retiree and Beneficiary Comparative Schedule

Year Ended June 30	Added to Rolls		Removed from Rolls		Rolls End of Year				% Incr. in Annual Pensions	Average Pension	Expected Removals	
	No.	Annual Pensions	No.	Annual Pensions	No.	Active Per Retired	Annual Pensions				No.	\$
							Dollars	% of Pay*				
1993	8	\$ 76,157	7	\$ 37,863	149	1.1	\$ 1,379,179	25.8 %	2.9 %	\$ 9,256	4.3	\$ 32,537
1994	13	182,612	1	8,297	161	1.0	1,553,494	26.6	12.6	9,649	4.6	35,545
1995	11	221,649	6	43,953	166	0.9	1,731,190	30.8	11.4	10,429	5.2	41,238
1996	13	251,022	6	69,322	173	1.1	1,912,890	33.3	10.5	11,057	5.5	45,700
1997	11	162,889	8	78,664	176	0.9	1,997,115	31.6	4.4	11,347	5.7	48,811
1998	9	187,510	6	43,223	179	0.9	2,141,402	32.8	7.2	11,963	6.2	53,260
1999	16	289,747	12	163,410	183	0.9	2,267,739	32.0	5.9	12,392	5.6	49,841
2000	6	163,121	8	66,733	181	1.0	2,364,127	31.3	4.3	13,061	5.8	52,574
2001	8	147,094	5	38,062	184	0.9	2,473,159	33.8	4.6	13,441	5.9	56,028
2002	9	190,085	11	88,107	182	0.9	2,575,137	32.7	4.1	14,149	6.0	57,982
2003	8	233,641	4	30,096	186	0.8	2,778,682	37.9	7.9	14,939	6.0	61,381
2004	15	454,673	10	96,771	191	0.8	3,136,584	45.0	12.9	16,422	6.5	66,604
2005	14	440,795	10	51,437	195	0.7	3,525,942	54.0	12.4	18,082	6.7	70,640
2006	6	230,143	9	128,414	192	0.7	3,627,671	53.5	2.9	18,894	7.2	84,343
2007	14	271,387	8	69,238	198	0.6	3,829,820	58.4	5.6	19,343	7.3	89,201
2008	6	108,961	5	19,817	199	0.6	3,918,964	59.0	2.3	19,693	7.6	96,874
2009	5	101,229	6	90,820	198	0.6	3,929,373	58.4	0.3	19,845	7.2	90,602
2010	12	206,333	6	72,949	204	0.5	4,062,757	63.8	3.4	19,915	7.7	98,271
2011	12	225,699	6	98,440	210	0.5	4,190,016	71.4	3.1	19,952	8.4	107,628
2012	8	190,569	5	85,405	213	0.4	4,295,180	81.0	2.5	20,165	9.0	114,822
2013	18	444,226	14	195,321	217	0.4	4,544,085	98.8	5.8	20,940	9.6	123,626
2014	7	176,718	10	118,734	214	0.4	4,602,069	99.8	1.3	21,505	9.4	129,877
2015	7	154,294	11	113,586	210	0.3	4,642,777	108.4	0.9	22,108	9.4	135,332
2016	10	230,088	8	199,859	212	0.3	4,673,006	109.7	0.7	22,042	9.5	143,393
2017	6	177,886	8	103,749	210	0.3	4,747,143	115.3	1.6	22,605	9.2	141,963

* Pay used for this purpose is the payroll for the now closed group of active members.

Retiree and Beneficiary Data June 30, 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 retirant	76	\$1,732,500
Option A pension - joint and survivor benefit	62	1,586,636
Option B pension - modified joint and survivor benefit	26	724,822
Survivor beneficiary of deceased age and service retiree	25	397,796
Other - benefit being paid to an ex-spouse	<u>9</u>	<u>85,260</u>
Total age and service pensions	198	\$4,527,014
Casualty Pensions		
Duty disability		
Regular pension	2	\$ 35,190
Non-Duty Disability pensions		
Regular pension	5	90,529
Option A pension		
Option B pension	1	10,617
Survivor beneficiary of deceased non-duty disability retiree	<u>2</u>	<u>6,430</u>
Total	10	142,766
Non-duty death - spouse	2	77,363
Total casualty pensions	<u>12</u>	<u>220,129</u>
Total Pensions Being Paid	210	\$4,747,143

Retiree and Beneficiary Data June 30, 2017 Tabulated by Age

Attained Age	No.	Annual Pensions
45 - 49	1	\$ 7,296
50 - 54	4	66,404
55 - 59	6	178,260
60 - 64	37	1,143,536
65	9	200,525
66	9	236,289
67	10	208,209
68	8	290,224
69	11	274,825
70	8	210,894
71	4	152,634
72	13	376,743
73	3	39,498
74	7	112,155
75	4	74,240
76	3	73,396
77	3	104,465
78	4	92,881
79	6	111,626
80	1	11,434
81	5	103,609
82	4	51,874
83	2	15,295
84	6	68,228
85	8	119,460
86	3	87,597
87	5	68,813
88	7	91,254
89	2	17,079
90	4	40,308
91	3	35,535
92	3	22,942
94	3	15,714
95	1	17,103
96	2	23,950
102	1	2,848
Totals	210	\$4,747,143

Average Age at Retirement: 57.9 years.

Average Age Now: 73.6 years.

Comparative Schedules Active Members in Valuation

Valuation Date June 30	Active Members	Valuation Payroll	Average			
			Age	Service	Pay	% Inc.
1993	166	\$5,353,229	45.8 yrs.	13.7 yrs.	\$32,248	1.7 %
1994	160	5,838,352	45.5	13.5	36,490	13.2
1995	157	5,623,083	44.7	13.4	35,816	(1.8)
1996	156	5,752,354	44.8	13.0	36,874	2.9
1997	163	6,311,705	44.5	12.2	38,722	5.0
1998	162	6,520,030	44.7	12.2	40,247	3.9
1999	167	7,090,025	44.4	11.1	42,455	5.5
2000	173	7,543,720	44.5	11.2	43,605	2.7
2001	169	7,316,759	45.1	11.5	43,294	(0.7)
2002	169	7,868,956	45.8	11.5	46,562	7.5
2003	154	7,324,919	46.6	11.4	47,564	2.2
2004	145	6,969,930	46.7	11.1	48,068	1.1
2005	134	6,532,301	47.0	10.7	48,749	1.4
2006	134	6,783,425	47.5	10.6	50,623	3.8
2007	124	6,557,936	47.2	11.4	52,887	4.5
2008	121	6,647,356	47.5	12.1	54,937	3.9
2009	117	6,726,665	48.3	12.8	57,493	4.7
2010	109	6,371,328	48.8	13.6	58,453	1.7
2011	98	5,865,873	49.0	14.6	59,856	2.4
2012	92	5,299,757	49.5	15.2	57,606	-3.8
2013	78	4,599,115	48.8	15.6	58,963	2.4
2014	75	4,611,639	49.4	16.4	61,489	4.3
2015	67	4,282,301	49.8	17.1	63,915	3.9
2016	66	4,261,711	50.6	18.1	64,571	1.0
2017	62	4,118,454	51.2	18.8	66,427	2.9

Active Members Added to and Removed from Rolls

Year Ended	Number Added During Year		Terminations During Year										Active Members End of Year
			Normal Retirement		Disability Retirement		Died-in-Service		Withdrawal				
	A	E	A	E	A	E	A	E	Vested	Other	Total		
06/30/13	0	0	11	9.0	0	0.3	1	0.2	1	1	2	1.8	78
06/30/14	0	0	3	4.8	0	0.3	0	0.2	0	0	0	1.6	75
06/30/15	0	0	4	5.9	0	0.3	0	0.2	3	1	4	1.4	67
06/30/16	0	0	1	5.5	0	0.3	0	0.2	0	0	0	1.3	66
06/30/17	0	0	4	6.7	0	0.3	0	0.1	0	0	0	1.1	62

A represents actual number.

E represents expected number.

Active Members June 30, 2017 By Age and Years of Service

Age	Years of Service to Valuation Date							Totals		
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Up	No.	Salary	Average
30-34			1					1	\$ 68,434	\$68,434
35-39		2	3	1				6	365,625	60,938
40-44			2	8	1			11	688,154	62,559
45-49			1	4	1			6	348,465	58,078
50-54			2	5	6			13	882,494	67,884
55-59			1	6	2	1	2	12	879,479	73,290
60				3	2		2	7	411,996	58,857
61				1				1	44,512	44,512
62					2			2	158,354	79,177
64					1			1	112,230	112,230
65+				2				2	158,711	79,356
Totals		2	10	30	15	1	4	62	\$4,118,454	\$66,427

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

Age: 51.2 years
 Service: 18.8 years
 Annual Pay: \$66,427

Inactive Vested Members June 30, 2017 Tabulated by Age

Age	No.	Estimated Deferred Annual Pensions
44	1	\$ 6,691
47	2	82,912
48	1	12,215
49	1	12,983
50	2	25,999
51	1	28,594
52	1	21,403
53	4	42,011
55	2	20,946
58	3	42,647
60	1	16,825
Totals	19	\$313,226

Average Age Now: 52.9 years

SECTION C

VALUATION METHODS AND ASSUMPTIONS

Actuarial Cost Method

The actuarial cost method is the procedure for allocating the actuarial present value of benefits and expenses to time periods. The method used for your valuation is known as the ***individual entry-age actuarial cost method***, and has the following characteristics:

- The annual normal costs for each individual active member is sufficient to accumulate the value of the member's pension at the time of retirement.
- Each annual normal cost is a constant percentage of the member's year-by-year projected pensionable compensation.

The unfunded actuarial accrued liability was financed as a level dollar of member payroll over a period of 24 years. This unfunded actuarial accrued liability payment reflects any payment expected to be made between the valuation date and the date contributions determined by this report are scheduled to begin.

The valuation assets used for funding purposes is derived as follows: prior year valuation assets are increased by contribution and expected investment income (net of expenses) and reduced by refunds and benefit payments. To this amount is added 25% of the difference between expected and actual investment income for each of the previous four years.

Excess Earning Reserve: An amount equal to the market value of the Excess Earning Reserve is added to the liabilities to assure proper allocation of assets to liabilities.

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 demographic information furnished by the Plan Sponsor, using the actuarial cost method described on the previous page.

The principal areas of financial risk which require assumptions about future experiences 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, retirants 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 as long as a present covered person survives - - - a period of time which can be as long as a century.

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.

Valuation Assumptions

The rate of investment is compounded annually net of expenses.

Investment Return	7.50%
Wage Inflation	3.50%
Price Inflation	2.75%
Spread Between Investment Return and Wage Inflation	4.00%
Spread Between Investment Return and Price Inflation	4.75%

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 Ending					5-Year Average
	6/30/17	6/30/16	6/30/15	6/30/14	6/30/13	
1) Nominal rate of return [#]	6.5 %	6.0 %	6.0 %	10.1 %	8.0 %	7.3%
2) Increase in CPI	1.6	1.0	0.1	2.1	1.8	1.3%
3) Average salary increase*	3.0	1.1	1.4	4.2	1.7	2.3%
4) Real return:						
- investment purposes	4.9	5.0	5.9	8.0	6.2	6.0%
- funding purposes	3.5	4.9	4.6	5.9	6.3	5.0%
- assumption	4.0	4.0	4.0	4.0	4.0	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.

* *Based on members who were active both at the beginning and end of the year.*

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. Base wage growth was set to 2.5% for 2012-2019.

Sample Salary Adjustment Factors Used to Project Salaries in Years 2020 and Beyond

Sample Ages	Percent Increase in Salary During Next Year	
	Base	Promotion & Seniority
20	3.5 %	3.7 %
25	3.5	3.2
30	3.5	2.7
35	3.5	2.2
40	3.5	1.4
45	3.5	0.7
50	3.5	0.2
55	3.5	0.0

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

Retirement Ages	Percent of Active Members Retiring within Next Year
50	20 %
51	20
52	20
53	20
54	20
55	25
56	25
57	25
58	25
59	25
60	30
61	30
62	30
63	30
64	30
65	100

These rates were first used for the June 30, 2008 valuation.

Valuation Assumptions (Continued)

Mortality. This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. The mortality rates utilized are based upon the RP-2014 tables, as extended, and include a margin for future mortality improvement projected using a fully generational improvement scale. These rates were first used for the June 30, 2016 valuation.

Descriptions of the tables and sample life expectancies are as follows:

- **Healthy Pre-Retirement:** The RP-2014 Employee Generational Mortality Tables, with blue-collar adjustments and extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2015.
- **Healthy Post-Retirement:** The RP-2014 Healthy Annuitant Generational Mortality Tables, with blue-collar adjustments and extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2015.
- **Disability Retirement:** The RP-2014 Disabled Mortality Table, extended via cubic spline. This table is adjusted backwards to 2006 with the MP-2014 scale. A base year of 2006 with future mortality improvements assumed each year using scale MP-2015.

Sample Attained Ages	Healthy Pre- Retirement		Healthy Post-Retirement		Disabled Retirement	
	Future Life Expectancy (Years)*		Future Life Expectancy (Years)*		Future Life Expectancy (Years)*	
	Men	Women	Men	Women	Men	Women
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

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

Valuation Assumptions (Concluded)

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
ALL	0	15.00 %
	1	12.00
	2	10.00
	3	8.00
	4	6.00
25	5 & Over	5.00
30		5.00
35		4.50
40		3.00
45		2.60
50		1.50
55		1.50
60		1.50

The rates were first used for the June 30, 2008 valuation.

Vested members who terminate with a benefit worth less than 100% of their own accumulated contributions were assumed to forfeit their vested benefit.

Rates of disability are represented by the following table:

Sample Ages	Percent Becoming Disabled within Next Year
20	0.03%
25	0.05%
30	0.07%
35	0.13%
40	0.19%
45	0.28%
50	0.45%
55	0.76%
60	1.10%

These rates were first used for the June 30, 1986 valuation. For purposes of the valuation we assume that all disabilities are ordinary.

Miscellaneous and Technical Assumptions

June 30, 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 the valuation year.
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 Operation:	All decrements the first 5 years of service. Only mortality operates during retirement eligibility.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Normal Form of Benefit:	Straight life benefit terminating at death of retiree.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Payroll Adjustment:	Members who did not work the entire plan year had pays adjusted to reasonably reflect a full year's pay.
Assumption Rationale:	Certain actuarial assumptions were based upon the results of an assumption study for the City of St. Clair Shores Employees Retirement System. A report dated August 11, 2016 presented the results of this study. Other assumptions were based upon an experience study dated, September 23, 2008. We believe these assumptions continue to be suitable for purposes of this study.

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, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

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

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

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.

Funding Value of Assets. The value of assets derived by spreading the capital value changes (unrealized and realized gain and losses) in equal dollar installments over four years. This treatment removes the timing of investment activities from the valuation process.

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.

Glossary (Concluded)

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

Amortization Payoff Schedule

Date	Period	Unfunded Liability (BOY)	Funded Ratio (BOY)	UAL Payment \$	Interest	Unfunded Liability (EOY)
June 30, 2017		\$ 25,934,022	60.8%			
July 1, 2018	24	25,609,877	61.5%	\$ 2,248,480	\$ 1,837,439	\$ 25,198,836
July 1, 2019	23	25,198,836	62.3%	2,248,480	1,806,611	24,756,967
July 1, 2020	22	24,756,967	63.0%	2,248,480	1,773,471	24,281,958
July 1, 2021	21	24,281,958	63.7%	2,248,480	1,737,845	23,771,324
July 1, 2022	20	23,771,324	64.4%	2,248,480	1,699,548	23,222,391
July 1, 2023	19	23,222,391	65.1%	2,248,480	1,658,378	22,632,290
July 1, 2024	18	22,632,290	65.8%	2,248,480	1,614,120	21,997,931
July 1, 2025	17	21,997,931	66.5%	2,248,480	1,566,543	21,315,994
July 1, 2026	16	21,315,994	67.2%	2,248,480	1,515,398	20,582,912
July 1, 2027	15	20,582,912	68.0%	2,248,480	1,460,417	19,794,849
July 1, 2028	14	19,794,849	68.7%	2,248,480	1,401,312	18,947,682
July 1, 2029	13	18,947,682	69.6%	2,248,480	1,337,774	18,036,977
July 1, 2030	12	18,036,977	70.5%	2,248,480	1,269,471	17,057,968
July 1, 2031	11	17,057,968	71.5%	2,248,480	1,196,046	16,005,535
July 1, 2032	10	16,005,535	72.6%	2,248,480	1,117,113	14,874,170
July 1, 2033	9	14,874,170	73.8%	2,248,480	1,032,261	13,657,951
July 1, 2034	8	13,657,951	75.3%	2,248,480	941,045	12,350,515
July 1, 2035	7	12,350,515	76.9%	2,248,480	842,987	10,945,023
July 1, 2036	6	10,945,023	78.9%	2,248,480	737,575	9,434,119
July 1, 2037	5	9,434,119	81.2%	2,248,480	624,257	7,809,896
July 1, 2038	4	7,809,896	83.8%	2,248,480	502,440	6,063,857
July 1, 2039	3	6,063,857	87.0%	2,248,480	371,488	4,186,865
July 1, 2040	2	4,186,865	90.7%	2,248,480	230,713	2,169,099
July 1, 2041	1	2,169,099	95.0%	2,248,480	79,381	(0)
July 1, 2042	0	(0)	100.0%	-	(0)	(0)

Unfunded liability 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 7.50% interest over a period of 24 years beginning on the Fiscal Year starting July 1, 2018.



October 5, 2017

Secretary of the Retirement Board
City of St. Clair Shores Employees
Retirement System
27600 Jefferson Circle Drive
St. Clair Shores, Michigan 48081

Dear Board Members:

Enclosed are 25 copies of the report of the 65th Annual Actuarial Valuation as of June 30, 2017 for the City of St. Clair Shores Employees Retirement System.

Sincerely,

A handwritten signature in black ink that reads "Rebecca L. Stouffer". The signature is written in a cursive, flowing style.

Rebecca L. Stouffer, ASA, MAAA

RLS:mrh
Enclosures