October 5, 2018

The Retirement Board The City of Bay City Police and Fire Retirement System Bay City, Michigan

Dear Board Members:

The purpose of the annual actuarial valuation of the City of Bay City Police and Fire Retirement System as of June 30, 2018 is to:

- Compute the liabilities associated with benefits likely to be paid on behalf of current retired and active members of the Retirement System,
- Compare accrued assets with accrued liabilities to assess the funded condition of the Retirement System, and
- Compute the City's recommended contribution rate for the Fiscal Year beginning July 1, 2019.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices. Data concerning active members, retirees, beneficiaries and assets was provided by the City. This data has been reviewed for reasonableness, but no attempt has been made to audit such information. The valuation was based on the provisions of the Retirement System as amended through July 1, 2018. The actuarial assumptions used in this valuation represent reasonable expectations of future experience under the System. This report was prepared under the direction of a member of the American Academy of Actuaries who meets the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Janise Myones Sandra MRodwan

Denise M. Jones

Sandra W. Rodwan Senior Consultant Member, American Academy of Actuaries

City of Bay City Police and Fire Retirement System

Actuarial Valuation as of June 30, 2018

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Section One: Valuation Summary



Purpose of Valuation

The purpose of the annual actuarial valuation of the City of Bay City Police and Fire Retirement System as of June 30, 2018 is to:

- Compute the liabilities associated with benefits likely to be paid on behalf of current retired and active members of the Retirement System,
- Compare accrued assets with accrued liabilities to assess the funded condition of the Retirement System, and
- Compute the City's recommended contribution rate for the Fiscal Year beginning July 1, 2019.

Liabilities and Funded Condition of Retirement System

Accrued liabilities of the Retirement System as of June 30, 2018 were computed to be \$65,832,521. The funding value of accrued assets was \$49,481,139. The ratio of the net funding value of accrued assets to accrued liabilities was 75.2%.

Funding Value of Assets

A smoothed market value of assets was used for the June 30, 2018 valuation. This method spreads market value gains and losses over 5 years. This method is unchanged from prior valuations.

Computed City Contribution Rate

The City's normal cost contribution rate for Police Patrol members was computed to be 7.57% of member payroll. The City's normal cost contribution rate for Police Command members was computed to be 9.26% of member payroll. The City's normal cost contribution rate for Fire members was computed to be 7.30% of member payroll.

Accrued assets were less than actuarial accrued liabilities. The unfunded actuarial accrued liabilities were amortized as level percents of payroll over 23 years.

In the Police Patrol division, the amortization payment is 26.26% of payroll. The City's total contribution rate for Police Patrol members is 33.83% of member payroll.

In the Police Command division, the amortization payment is 26.26% of payroll. The City's total contribution rate for Police Command members is 35.52% of member payroll.

In the Fire division, the amortization payment is 26.26% of member payroll. The total contribution rate for Fire members is 33.56% of member payroll.

The 23 year amortization period is a one year decrease from the period used last year as adopted by the Board of Trustees on May 9, 2017. The amortization period will decrease one year each year down to 20 years, and then remain at 20 years open.

The City's weighted average total contribution rate is 34.17% of payroll.

Retirement System Experience

Overall recognized experience of the Retirement System during the year ended June 30, 2018 was more favorable than assumed. The primary source of the favorable experience was the recognized rate of investment return on the smoothed funding value of assets which was more than the assumed rate (9.67% vs. 7.5%).

Benefit Provision Changes

There were no benefit changes in the valuation.

Assumption and Method Changes

There were no assumption or method changes in the valuation

Participant Data

	06/30/2018	06/30/2017
Active Members	68	73
Valuation Payroll	\$4,056,629	\$4,204,892
Retirees and Beneficiaries	175	174
Annual Pensions	\$4,755,934	\$4,611,437
Inactive Vested Members	13	13
Estimated Annual Pensions	\$205,807	\$205,807

Financial Data

	06/30/2018	06/30/2017
Funding Value of Assets Total Market Value of Assets	\$49,481,139 54,781,290	\$48,912,762 54,689,793

Section Two:

Actuarial Calculations – Funding



Computed Contribution Rates for The Year Beginning July 1, 2019

The contribution rates shown below are expressed as level percents of active member payroll.

The normal cost can be viewed as the long-term on-going cost of the Retirement System.

Unfunded actuarial accrued liability was amortized over a 23 year period and added to the City's computed normal cost.

The 23 year period is a one year decrease from the period used for the prior valuation.

Contribution Recommendation:

	Police			
	Police Patrol	Command	<u>Fire</u>	Total
Normal Cost				
Regular Retirement	13.42%	14.17%	13.75%	13.65%
Pre-retirement Death	0.36	0.38	0.56	0.37
Disability	0.70	1.08	1.56	.81
Withdrawal	3.09	3.63	1.43	3.26
Total Normal Cost	17.57	19.26	17.30	18.09
Member Portion	<u>10.00</u>	10.00	<u>10.00</u>	10.00
City's Computed Normal Cost	7.57	9.26	7.30	8.09
Total Unfunded Accrued Liability*	26.26	26.26	26.26	26.26
City's Net Contribution Rate	33.83%	35.52%	33.56%	34.17%
City's Dollar Contribution**	\$712,752	\$345,805	\$327,618	\$1,386,175

^{* 23} year amortization.

^{**} Based on valuation payroll of June 30, 2018.

Unfunded Actuarial Accrued Liability

	<u>June 30, 2018</u>	June 30, 2017
Actuarial Accrued Liabilities	\$65,832,521	\$65,289,512
Valuation Assets	49,481,139	48,912,762
Unfunded Actuarial Accrued Liabilities	\$16,351,382	\$16,376,750

Recommended City Contribution Rates

Fiscal Year Beginning July 1	Valuation Date	As a Percent of Payroll	Dollars
1996	06/30/1995	14.95%	\$806,993
1997	06/30/1996	11.07	743,751
1998*#	06/30/1997	10.77	575,958
1999#	06/30/1998	8.51	605,319
2000	06/30/1999	7.04	523,457
2001#	06/30/2000	6.76	430,767
2002	06/30/2001	7.47	456,005
2003	06/30/2002	7.83	457,310
2004	06/30/2003	12.96	801,487
2005*	06/30/2004	23.86	1,501,912
2006*	06/30/2005	26.08	1,605,480
2007*	06/30/2006	26.16	1,651,747
2008	06/30/2007	26.79	1,618,068
2009	06/30/2008	26.35	1,628,128**
2010	06/30/2009	29.86	1,776,113**
2011	06/30/2010	32.55	1,848,581**
2012#*	06/30/2011	37.59	2,077,312**
2013*	06/30/2012	41.31	2,159,632**
2014	06/30/2013	43.41	2,096,177**
2015	06/30/2014	38.36	1,735,584**
2016	06/30/2015	34.61	1,490,904**
2017	06/30/2016	33.18	1,453,457**
2018#	06/30/2017	31.83	1,338,389**
2019	06/30/2018	34.17	1,386,175*

^{*}Retirement System amended.

Note: Throughout this report, results prior to 2005 are based on reports provided by previous actuarial firm.

[#]Assumptions changed.

^{**}Based on valuation payroll. The actual contribution will be based on the actual payroll.

History of Assets and Accrued Liabilities

		Actuarial		Unfunded
Valuation	Valuation	Accrued	Funded	Actuarial Accrued
Date	Assets	Liabilities	Ratio	Liabilities
6/30/1995	\$34,465,751	\$36,936,108	93.3%	\$2,470,357
6/30/1996	38,291,651	38,489,257	99.5	197,606
6/30/1997*#	40,890,619	41,791,038	97.8	900,419
6/30/1998#	44,936,961	44,376,073	101.3	(560,888)
6/30/1999	48,210,388	44,601,010	108.1	(3,609,378)
6/30/2000	49,920,655	39,255,977	127.2	(10,664,678)
6/30/2001#	48,468,116	38,017,452	127.5	(10,450,664)
6/30/2002	46,080,307	36,417,979	126.5	(9,662,328)
6/30/2003	42,243,440	42,568,692	99.2	325,252
6/30/2004*	40,854,232	46,818,606	87.3	5,964,374
6/30/2005*	40,949,739	53,676,056	76.3	12,726,317
6/30/2006*	43,663,072	55,877,091	78.1	12,214,019
6/30/2007	46,365,165	59,001,185	78.6	12,636,020
6/30/2008	48,162,620	60,101,971	80.1	11,939,351
6/30/2009	45,290,860	61,088,699	74.1	15,797,839
6/30/2010	43,369,680	61,823,912	70.2	18,454,232
6/30/2011#	42,095,297	64,843,292	64.9	22,747,995
6/30/2012	39,819,306	65,058,041	61.2	25,238,735
6/30/2013	39,469,073	64,852,922	60.9	25,383,849
6/30/2014	43,824,808	64,946,510	67.5	21,121,702
6/30/2015	46,508,082	63,672,843	73.0	17,164,761
6/30/2016	47,693,326	63,819,910	74.7	16,126,584
6/30/2017#	48,912,762	65,289,512	74.9	16,376,750
6/30/2018	49,481,139	65,832,521	75.2	16,351,382

^{*} Retirement System Amended.

Results shown throughout this report for years prior to 2005 were prepared by the previous actuarial firm.

[#] Assumptions Changed

Actuarial Balance Sheet June 30, 2018

Actuarial Assets

Accrued Assets		
Assets from system's financial statements	\$54,781,290	
(market value)		
Funding value adjustment	(5,300,151)	_
Total accrued assets		\$49,481,139
Actuarial present value of expected future		
For normal costs	6,109,189	
For unfunded actuarial accrued liabilities	16,351,382	
		22,460,571
TALA SIDA WILLIAM		
Total Actuarial Present Value of Present		
and Expected Future Resources		\$71,942,340

Actuarial Present Values (Liability)

To retirees and beneficiaries	\$46,641,770
To vested terminated members	1,588,730
To active members	
Allocated to service rendered prior to	
valuation date	17,602,021
Allocated to service rendered after	
valuation date	6,109,819
Total Actuarial Present Value of Expected	
Future Benefit Payments.	\$71,942,340

Comments Recommendation and Conclusion

Comment 1: The overall recognized experience of the Retirement System during the year ended June 30, 2018 was more favorable than the long term assumptions. The recognized rate of investment return on the smoothed funding value of assets (9.67% vs. 7.5% assumed) was the primary source of the favorable experience. The increase in the funded ratio reflects the experience during the year.

Conclusion: The overall funded condition of the Retirement System improved slightly during the year ending June 30, 2018. Improvement in the funded condition is dependent upon continued receipt of recommended employer contributions and the actual experience emerging in the future.

Section Three:

Retirement System Benefit Provisions



Benefit Provision Summary

Service Retirement

Eligibility: 25 or more years of service regardless of age or age 55 with 10 years of service.

Annual Benefit:

Straight life pension equals 2.8% (2.5% for retirement with less than 25 years of service) of 3 year final average compensation (FAC) times years of service. Maximum benefit is 70% of the base rate of pay for rank at retirement, including a portion of bonus pay for police patrol and Command. FAC does not include sick leave. For Police members hired after 7/1/2014, the multiplier is 2.0% of FAC times years of service. FAC does not include sick leave.

Deferred Retirement

Eligibility: 10 or more years of service.

Annual Benefit:

Computed as service retirement but based upon service, FAC and benefit multiplier in effect at termination. Benefit begins at age 55.

Death After Retirement Survivor's Pension

Eligibility: Payable to a surviving spouse, if any, upon the death of a retired member who was receiving a straight life pension.

Annual Benefit:

Spouse's pension equals 50% or 65% (Fire retirements after 6/30/97, Police Patrol retirement after 1/1/98 or Police Command retirements after 10/1/98) of the straight life pension the deceased retiree was receiving.

Non-Duty Death in Service Survivor's Pension

Eligibility: Payable to a surviving spouse, if any, upon the death of a member.

Annual Benefit:

50% of the service retirement benefit, but not less than 25% of the maximum benefit to the spouse. 15% of final salary for one child (unmarried and under age 18) and equal shares of 25% of final salary for two or more children. Worker's Compensation payments are offset.

Duty Death in Service Survivor's Pension

Eligibility: Death in the line of duty or within five years following duty disability retirement from the same cause.

Annual Benefit:

33% of final salary to a spouse. 25% of final salary in equal shares to unmarried children under age 18. Worker's Compensation payments are offset.

Duty Disability Retirement

Eligibility: Payable upon the total and permanent disability of a member.

Annual Benefit:

To age 55: 50% of AFC.

At age 55: Same as Service Retirement Pension with additional service credit to include the period of disability.

the period of disability.

Non-Duty Disability

Eligibility: Payable upon the total and permanent disability of a member.

Annual Benefit:

Same as service retirement. Minimum benefit is 25% of final salary. Worker's Compensation payments are offset.

Member Contributions

Police Patrol & Command, Fire Chief & Deputy Fire Chief: 10.00% of pay. Fire: 10% of pay. Interest is credited at 5% per year.

Annuity Withdrawal

Benefits are actuarially reduced if member contributions are withdrawn at retirement. Actuarial equivalence is based on P.B.G.C. rates in effect on the date of retirement.

Cost of Living Adjustments

Fire members retiring after July 1, 1997, Police Patrol retiring after July 1, 2005 and Police Command retiring after October 1, 1998 - 5% (4% for Police Patrol retiring between January 1, 1998 and June 30, 2005 and 3.5% for Police Patrol retiring after May 7, 2012) of the original benefit on the 5th, 10^{th} and 15^{th} anniversaries of retirement. The pension escalator shall only be calculated on credited service prior to 7/1/2014 (1/1/2014 for Fire).

Section Four:

Actuarial Assumptions And Methods



Actuarial Assumptions

Economic Assumptions

(i) Interest Rate 7.5% (net of expenses)

(ii) Salary Increases

Across-the-Board 3.5%

Merit and Longevity Service-related rates

Sample Annual Rates of Salary Increase

		Seniority	
	Across-the-		
Service	Board	Police	Fire
1	3.5%	13.6%	0%
2	3.5	13.6	0
3	3.5	22.8	0
4	3.5	1.0	0
5	3.5	1.0	0
6+	3.5	1.0	0

Demographic Assumptions

(i) Mortality

RP 2000 Combined Healthy Mortality Table Projected to 2014

Sample	Future Life Expectancy (Years)	
Ages	Men	Women
55	27.5	29.7
60	23.0	25.0
65	18.8	20.8
70	14.9	16.9
75	11.3	13.3
80	8.3	10.1

(ii) Disability

Percent Becoming Disabled within a Year

Sample Ages	Men	Women
20	0.08%	0.08%
25	0.08	0.08
30	0.08	0.08
35	0.08	0.08
40	0.20	0.20
45	0.26	0.26
50	0.49	0.49
55	0.89	0.89

(iii) Termination of Employment

Service related rates for first 5 years of employment. Age related rates after first 5 years of employment

Sample Ages	Years of Service	Percent Terminating
All	0	4.0
	1	4.0
	2	3.5
	3	3.5
	4	3.5
25	5 & Over	3.5
30		2.5
35		2.0
40		1.5
45		0.5
50		0.0
55		0.0
60		0.0

(iv) Retirement Rates

Probabilities of Retirement for Members Eligible to Retire

	Percent Retiring				
Age	Police	Fire			
45	20%	12%			
46	20	12			
47	20	12			
48	20	12			
49	20	12			
50	25	20			
51	25	20			
52	25	20			
53	25	20			
54	25	20			
55	30	20			
56	30	20			
57	30	20			
58	30	20			
59	30	20			
60	100	100			

Actuarial Method Used for the Valuation

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

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

Financing of Unfunded Actuarial Accrued Liability. Unfunded actuarial accrued liability was amortized as a level percent of payroll over a 23 year period and added to the computed employer normal cost. The 23 year amortization period is a one year decrease from the period used to amortize unfunded actuarial accrued liability last year.

Active member payroll was assumed to increase 3.5% a year for the purpose of determining the level percent of payroll amortization payment.

Section Five: Valuation Data



Asset Summary

As of June 30, 2018 the market value of assets was reported to be \$54,781,290. The net funding value of assets (smoothed market value) was computed to be \$49,481,139.

Funding Value of Assets

A. Funding Value Beginning of Year	48,912,762
B. Contribution Income	1,887,080
C. Net Interest and Dividend Income	586,873
D. Benefits Paid and Administrative Expenses	5,855,907
E. Preliminary Funding Value (A+B+C-D)	45,530,808
F. Phased-In Recognition of Excess Investment Income	
F1. Current Year	703,735
F2. First Prior Year	1,074,411
F3. Second Prior Year	(58,598)
F4. Third Prior Year	470,910
F5. Fourth Prior Year	1,759,873
F6. Total Phase-In	3,950,331
G. Preliminary Actuarial Value 6/30 (E+F)	49,481,139
H. Corridors	
120% of Market Value	65,737,548
80% of Market	
Value	43,825,032
I. Recognized Actuarial Value	49,481,139
J. Recognized Rate of Return	9.67%
K. Funding Value End of Year	49,481,139

Summary of Asset Information Submitted for the Valuation

Market Value June 30, 2017	\$54,689,795
Additions	
Contributions	
Employer	1,406,290
Members	480,790
Total contributions	1,887,080
Net investment income	4,060,322
Total additions (net of investment losses)	\$5,947,402
Deductions	
Benefits and refunds paid to members	\$5,705,932
Refund of member contributions	-
Administrative expenses	149,975
Total deductions	5,855,907
Net increase (decrease) in plan net assets	\$91,495
Market Value June 30, 2018	\$54,781,290
,	

Participant Summary

Retirees and Beneficiaries Included in the Valuation

There were 175 retirees and beneficiaries included in the valuation, with annual pensions totaling \$4,755,930. There were 6 retirees and one alternate payee added during the year, 6 retirees and/or beneficiaries removed and 1 survivor beneficiary added.

Pensions Being Paid Historical Schedule

	1	1113	storical Scheu	-uic	
Valuation Date		Annual	Discounted Value	e of Pensions	
June 30	No.	Pensions	Pension	Total	Average
1995	165	\$2,210,126	\$13,395	\$21,019,793	\$127,393
1996	162	2,342,165	14,458	22,561,603	139,269
1997	164	2,521,006	15,372	24,286,312	148,087
1998	166	2,642,010	15,916	25,236,049	152,024
1999	172	2,910,567	16,922	27,530,129	160,059
2000	175	3,071,949	17,554	28,159,444	160,911
2001	177	3,171,132	17,916	30,160,403	170,398
2002	183	3,404,118	18,602	26,360,885	144,049
2003	182	3,440,015	18,901	31,277,627	171,855
2004	178	3,393,566	19,065	30,351,469	170,514
2005	177	3,466,719	19,586	33,354,179	188,442
2006	172	3,418,899	19,877	32,530,398	189,130
2007	173	3,655,105	21,128	35,739,404	206,586
2008	170	3,681,270	21,655	35,277,653	307,516
2009	172	3,872,772	22,516	37,044,947	215,378
2010	174	4,028,500	23,152	38,525,434	221,411
2011	171	4,087,008	23,901	39,944,851	233,596
2012	168	4,073,377	24,246	39,530,344	235,300
2013	170	4,132,437	24,308	40,187,988	236,400
2014	168	4,189,358	24,937	40,451,344	240,782
2015	168	4,360,446	25,955	42,643,623	253,831
2016	170	4,407,190	25,925	42,026,752	247,216
2017	174	4,611,437	26,503	45,337,529	260,561
2018	175	4,755,934	27,177	46,641,770	266,524

Retired Members and Survivors – June 30, 2018

Attained		Annual
<u>Age</u>	<u>No.</u>	Pensions
45-49	2	\$50,048
50-54	13	425,642
55-59	23	868,464
60-64	19	604,834
65-69	25	746,263
70-74	20	575,471
75-79	29	703,022
80-84	25	520,103
85-89	9	136,241
90-94	7	97,090
95-99	3_	28,756
Totals	175	\$4,755,934

Includes 4 alternate payees receiving \$48,892 in payments.

Active Member Summary – June 30, 2018

Police Patrol Members - June 30, 2018 Age and Service Distribution

Attained		Service						Totals
Age	0-4	5-9	10-14	15-19	20-24	25-29	No.	Payroll
20-24	4						4	\$189,904
25-29	4						4	201,801
30-34	4						4	213,719
35-39				2			2	114,857
40-44	1			11	1		13	758,073
45-49				1	7		8	453,563
50-54					2	1	3	174,948
Totals	13	0	0	14	10	1	38	\$ 2,106,865

Group Averages

Age: 38.8 years Service: 14.1 years Annual Pay: \$55,444

Police Command Members - June 30, 2018 Age and Service Distribution

Attained					Totals
Age	10-14	15-19	20-24	No.	Payroll
40-44		5	1	6	\$435,505
45-49			4	4	284,399
50-54	1		2	3	253,645
Totals	1	5	7	13	\$973,549

Group Averages

Age: 45.5 years Service: 20.4 years Annual Pay: \$74,888

Fire Members - June 30, 2018 Age and Service Distribution

Attained	Service						Totals	
Age	0-4	5-9	10-14	15-19	20-24	25-29	No.	Payroll
35-39		1					1	\$53,348
40-44			1		1		2	111,529
45-49			3		3		6	337,441
50-54				1	6		7	411,231
55-59					1		1	62,666
Totals		1	4	1	11		17	\$976,215

Group Averages

Age: 48.6 years Service: 19.4 years Annual Pay: \$57,424

Active Members – June 30, 2018

		Police		
	Police Patrol	Command	Fire	Total
Active Members	38	13	17	68
Valuation Payroll	\$2,106,865	\$973,549	\$976,215	\$4,056,629
Average Compensation	\$55,444	\$74,888	\$57,424	\$59,656
Average Age (yrs.)	38.8	45.5	48.6	43.0
Average Service (yrs.)	14.1	20.4	19.4	16.6

Active Members – Three-Year Summary

	2018	2017	2016
Active Members	68	73	74
Valuation Payroll	\$4,056,629	\$4,204,892	\$4,380,402
Average Compensation	\$59,656	\$57,601	\$56,888
Average Age (yrs.)	43.0	43.4	44.0
Average Service (yrs.)	16.6	16.6	17.0