

May 30, 2017

The Retirement Board
Macomb Township Act 345 Fire Retirement System
Macomb Township, Michigan

Dear Board Members:

The purpose of the biennial actuarial valuation of the Macomb Township Act 345 Fire Retirement System as of June 30, 2016 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 Township's recommended contribution rate for the Fiscal Years beginning July 1, 2016 and July 1, 2017.

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 Township. 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 June 30, 2016. Each actuarial assumption used in this valuation represents reasonable expectations of future experience under the System. This valuation has been prepared under the supervision of a Member of the American Academy of Actuaries qualified to render the actuarial opinions contained herein.

Respectfully submitted,



Denise M. Jones
Senior Consultant



Sandra W. Rodwan
Member, American Academy of Actuaries

Macomb Township Act 345 Fire Retirement System

Actuarial Valuation as of June 30, 2016

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Section One:
Valuation Summary



Purpose of Valuation

The purpose of the biennial actuarial valuation of the Macomb Township Act 345 Fire Retirement System as of June 30, 2016 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 Township's recommended contribution rate for the Fiscal Years beginning July 1, 2016 and July 1, 2017.

Liabilities and Funded Condition of Retirement System

Accrued liabilities of the Retirement System as of June 30, 2016 were computed to be \$2,679,463. The market value of accrued assets was \$2,461,901. The ratio of the market value of accrued assets to accrued liabilities was 91.9%.

Funding Value of Assets

The market value of assets was used for the June 30, 2016 valuation.

Computed Township Contribution Rate

The Township's normal cost contribution rate was computed to be 14.23% of member payroll (19.23% total minus 5% member contribution). Unfunded actuarial accrued liability was amortized over 5 years as a level percent of payroll, producing an amortization payment of 9.01% of member payroll. The 5 year amortization period is a two year decrease from the 7 year period used 2 years ago for the last valuation.

The Township's total contribution rate for the Fiscal Years beginning July 1, 2016 and July 1, 2017 was therefore computed to be 23.24% of member payroll.

Retirement System Experience

Overall experience of the Retirement System during the two years ended June 30, 2016 was offsetting.

Assumption and Method Changes

This revised actuarial valuation includes a change in assumed mortality rates as adopted by the Board. The mortality table was changed from the 1971 Group Annuity Mortality table projected to 1984 to the RP-2014 Mortality Table. Also, the assumed retirement rates were extended from age 60 to 62. The amortization period was decreased to 5 years from the 7 year period used 2 years ago in the last valuation, in continuation of past practice. There were no changes in actuarial cost methods.

Participant Data

	<u>6/30/2016</u>	<u>6/30/2014</u>
Active Members	7	9
Active Member Payroll	\$506,370	\$607,771
Retirees and Beneficiaries	4	4
Annual Pensions	\$154,056	\$154,056
Deferred Vested member	-	-
Annual Pensions	-	-

Financial Data

	<u>6/30/2016</u>	<u>6/30/2014</u>
Valuation Assets	\$2,461,901	\$2,434,704
Market Value of Assets	\$2,461,901	\$2,434,704

Conclusion

The overall accrued funded ratio of the Retirement System decreased during the 2 years ended June 30, 2016 due to the change in mortality assumption. The ratio of the accrued funding value of assets to accrued liabilities is 91.9%, a decrease from 99.4% as of the June 30, 2014 valuation. Without the assumption change the funded ratio would have been 99.5%.



Section Two:

***Actuarial Calculations –
Funding***



Computed Contribution Rates for Fiscal Year Beginning July 1, 2016

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

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

The unfunded accrued liability as of June 30, 2016 was amortized over 5 years. The 5 year period is a 2 year decrease from the 7 year period used 2 years ago for the June 30, 2014 valuation.

Contribution Recommendation:

	<u>Percents of Payroll</u>
Normal Cost	
Regular Retirement	15.61%
Pre-retirement Death	0.47
Disability	2.30
Withdrawal	0.51
Refunds of member contributions	<u>0.33</u>
Total Normal Cost	19.23%
Member portion	5.00
Township’s Computed Normal Cost	14.23
Unfunded Actuarial Accrued Liability	9.01
Township’s Total Computed Contribution Rate	23.24%
Dollar Amount Based on Valuation Payroll*	\$117,680*

*Valuation Payroll was \$506,370 as of June 30, 2016. Actual dollar contribution should be based on pensionable payroll for the applicable fiscal year.

Unfunded Actuarial Accrued Liability

	<u>June 30, 2016</u>	<u>June 30, 2014</u>
Actuarial accrued liability	\$2,679,463	\$2,450,074
Assets allocated to funding	<u>2,461,901</u>	<u>2,434,704</u>
Unfunded actuarial accrued liability	\$217,562	\$15,370

Recommended Township Contributions

Valuation Date June 30	Computed Township Dollar Contributions	Percent of Valuation Payroll
2000	\$69,853	32.38%
2002	110,309	38.19
2004	82,821	36.73
2006	139,003	26.34
2008	175,998	27.60
2010	93,391	19.60
2012	132,543	25.44
2014	104,779	17.24
2016(b)	74,993	14.81
2016(a)	117,680	23.23

- (a)After change in mortality assumptions.
- (b)Before change in mortality assumptions.

Note: Results prior to 2002 are based on reports provided by previous actuarial firm.

History of Assets and Accrued Liabilities

Valuation Date	Valuation Assets	Actuarial Accrued Liabilities	Funded Ratio	Unfunded Actuarial Accrued Liabilities
12/31/89	\$	\$108,108	- %	\$108,108
12/31/90	11,685	162,326	7.2	150,641
12/31/91	23,398	219,016	10.7	195,618
12/31/92	21,050	254,976	8.3	233,926
06/30/94	53,481	567,639	9.4	514,158
06/30/96	193,714	702,138	27.6	508,424
06/30/98	415,011	803,297	51.7	388,286
06/30/00	606,981	937,625	64.7	330,644
06/30/02	630,031	1,158,301	54.4	528,270
06/30/04	968,361	1,323,015	73.2	354,654
06/30/06	1,235,360	1,456,615	84.8	221,255
06/30/08	1,527,110	1,878,379	81.3	351,269
06/30/10	1,798,531	2,089,721	86.1	291,190
06/30/12	2,041,728	2,402,520	85.0	360,792
06/30/14	2,434,704	2,450,074	99.4	15,370
06/30/16(b)	2,461,901	2,475,492	99.5	13,591
06/30/16(a)	2,461,901	2,679,463	91.9	217,562

Results shown throughout this report for years prior to 2002 were prepared by the previous actuarial firm.

Actuarial Balance Sheet June 30, 2016

Actuarial Assets

Accrued Assets		
Assets from system’s financial statements (market value)	\$2,461,901	
Funding value adjustment	<u>0</u>	
Total accrued assets		\$2,461,901
Actuarial present value of expected future contributions		
For normal costs	1,468,163	
For unfunded actuarial accrued liabilities	<u>217,562</u>	
		<u>1,685,725</u>
Total Actuarial Present Value of Present and Expected Future Resources		<u>\$4,147,626</u>

Actuarial Present Values (Liability)

To retirees and beneficiaries		\$2,032,340
To vested terminated members		0
Reserve for non-vested employee contributions		72,140
To active members		
Allocated to service rendered prior to valuation date		574,983
Allocated to service rendered after valuation date		<u>1,468,163</u>
Total Actuarial Present Value of Expected Future Payments		<u>\$4,147,626</u>

Comments, Recommendations and Conclusion

Comment 1: The overall actuarial experience of the Retirement System during the two year period ended June 30, 2016 was offsetting.

Comment 2: During the two years ended June 30, 2016, no active members retired, two active members terminated employment and no new active members were hired. The investment return on the market value of assets was less than the 5% assumed annual rate.

Conclusion: The overall funded ratio of the Retirement System decreased during the 2 years ended June 30, 2016 due to the change in mortality assumption. The ratio of the accrued funding value of assets to accrued liabilities is 91.9%, a decrease from 99.4% as of the June 30, 2014 valuation. Without the assumption change the funded ratio would have been 99.5%.

Section Three:

***Retirement System
Benefit Provisions***



Benefit Provision Summary

Regular Retirement

Eligibility:

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

Service Credit:

1 year of service credit for each year of service.

Annual Benefit:

Straight life pension equals 2.5% of 3 year average final compensation (AFC) times first 25 years of service plus 1% of AFC times years of service in excess of 25 years. Maximum is 70% of base annual salary. 60% of the annual benefit continues to the surviving spouse of the member if the member is married at time of retirement.

Members hired before 1/1/04: Average final compensation includes base pay, part-time paid wages, overtime wages and longevity.

Members hired after 1/1/04: Average final compensation includes base pay only.

Deferred Retirement

Eligibility:

10 or more years of service.

Annual Benefit:

Computed as service retirement but based upon service, AFC and benefit provisions in effect at termination. Benefit begins at date retirement would have occurred had member remained in employment.

Duty Disability Retirement

Eligibility:

Payable upon the total and permanent disability of a member in the line of duty.

Annual Benefit:

To age 55: 50% of AFC.

At age 55: Same as Service Retirement Pension with service credit from date of disability to age 55.

Non-Duty Disability

Eligibility:

Payable upon the total and permanent disability of a member with 5 or more years of service

Annual Benefit:

Disabled before Age 55 - To Age 55: 1.5% of AFC times years of service.

At Age 55: 2.0% of AFC times years of service.

Disabled after Age 55 - Same as Service Retirement Pension.

Duty Death in Service Survivor's Pension

Eligibility:

Payable upon the expiration of a worker's compensation to the surviving spouse, if any, of a member who died in the line of duty.

Annual Benefit:

Same amount that was paid by worker's compensation.

Non-Duty Death in Service Survivor's Pension

Eligibility:

Payable to a surviving spouse, if any, upon the death of a member with 20 or more years of service.

Annual Benefit:

Accrued straight life pension actuarially reduced in accordance with an Option I election.

Member Contributions

5.0% of base pay, part-time wages, overtime and longevity for members hired prior to January 1, 2004.

5.0% of base pay for members hired after January 1, 2004.



Section Four:

***Actuarial Assumptions
And Methods***



Actuarial Assumptions

Economic Assumptions

- (i) Interest Rate 5.0% (net of expenses)

- (ii) Salary Increases
 - Across-the-Board 3.0%
 - Merit and Longevity Age-related rates

Sample Annual Rates of Salary Increase

Age	Across-the-Board	Merit and Longevity	Total
20	3.0%	3.8%	6.8%
25	3.0	3.1	6.1
30	3.0	2.7	5.7
35	3.0	2.4	5.4
40	3.0	2.1	5.1
45	3.0	1.7	4.7
50	3.0	1.1	4.1
55	3.0	0.7	3.7
60	5.0	0.2	3.2

Demographic Assumptions

(i) Mortality

RP 2014 Healthy Annuitant
Mortality Table

Sample Ages	Future Life Expectancy (Years)	
	Men	Women
55	28.23	30.70
60	24.07	26.29
65	20.05	22.04
70	16.23	18.01
75	12.70	14.28
80	9.54	10.90

(ii) Disability

Sample Ages	Percent Becoming Disabled Within Next Year
20	0.08 %
25	0.08
30	0.08
35	0.08
40	0.20
45	0.26
50	0.49

(iii) Termination of Employment

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

Sample Ages	Years of Service	Percent Terminating
All	0	12.00%
	1	9.00
	2	7.00
	3	5.00
	4	4.50
25	5 & Over	4.50
30		3.90
35		2.30
40		0.90
45		0.50
50		0.50
55		0.50
60		0.50

(iv) **Retirement Rates**

Age-related rates

**Active Members Retiring within Year
Following Attainment of Indicated Retirement Age**

Retirement Ages	Percent Retiring
50	35%
51	25
52	20
53	15
54	15
55	15
56	15
57	15
58	25
59	30
60	90
61	95
62	100

A member was assumed to be eligible for retirement upon meeting the following conditions:

Attaining age 50 with 25 years of service or after attaining age 60 with 10 years of service.

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. Actuarial accrued liability was amortized over a 5 year period as of June 30, 2016.

Active member payroll was assumed to increase 3.0% a year for the purpose of determining the level percent of payroll contribution for unfunded actuarial accrued liability.



Section Five:
Valuation Data



Participant Summary

Retirees and Beneficiaries Included in the Valuation

There were 4 retirees included in the valuation, with annual pensions totaling \$154,056. There were no new retirees added and no retirees removed during the 2 year period ending June 30, 2016.

Pensions Being Paid

Valuation Date	No.	Annual Pensions	Average Pension	Discounted Value of Pensions	
				Total	Average
12/31/90	1	\$7,550	\$7,550	N/A	
12/31/91	1	11,187	11,187	N/A	
12/31/92	1	11,187	11,187	N/A	
06/30/94	1	11,187	11,187	N/A	
06/30/96	1	11,187	11,187	N/A	
06/30/98	1	11,187	11,187	N/A	
06/30/00	1	11,187	11,187	\$83,943	\$83,943
06/30/02	1	11,187	11,187	66,218	66,218
06/30/04	2	30,063	15,032	268,421	134,211
06/30/06	2	30,063	15,032	256,347	128,173
06/30/08	2	30,063	15,032	244,273	122,136
06/30/10	4	132,743	33,186	1,412,694	353,174
06/30/12	4	154,056	38,514	2,007,568	501,892
06/30/14	4	154,056	38,514	1,920,123	480,031
06/30/16	4	154,056	38,514	2,032,340	508,085

Note: Results prior to 2002 are based on reports provided by previous actuarial firm.

**Retirees and Beneficiaries as of
June 30, 2016**

<u>Age</u>	<u>No.</u>	<u>Annual Benefit</u>
64	1	\$32,500
66	2	102,680
77	1	18,876
Totals	4	\$154,056

Active Member Summary

Active Members as of June 30, 2016

Attained Age	Service						Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	No.	Payroll
36	1						1	\$ 62,733
41	1						1	62,733
42		1					1	82,000
44			1				1	96,000
46		1					1	62,733
50	1						1	62,733
60			1				1	77,438
Totals	3	2	2				7	\$ 506,370

Group Averages

Average Age: 45.7 years
Average Service: 7.0 years
Average Pay: \$72,339

Active Members – Three-Year Summary

	2016	2014	2012
Active Members	7	9	8
Valuation Payroll	\$506,370	\$607,771	\$521,004
Average Compensation	\$72,339	\$67,530	\$65,126
Average Age (yrs.)	45.7	42.5	43.6
Average Service (yrs.)	7.0	4.8	4.2

Vested Terminated Member

There were no vested terminated members as of June 30, 2016.