City of Madison Heights
Police and Fire Retirement System
Actuarial Valuation Report
June 30, 2024

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December 5, 2024

Retirement Board
City of Madison Heights Police
and Fire Retirement System
Madison Heights, Michigan

Dear Board Members:

The results of the June 30, 2024 Annual Actuarial Valuation of the City of Madison Heights Police and Fire Retirement System are presented in this report. This replaces our report issued November 5, 2024.

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

The purposes of this valuation are to measure the System's funding progress and to determine the employer contribution rate for the fiscal year ending June 30, 2026. 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 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-12 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. 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 findings in this report are based on data and other information through June 30, 2024. This valuation was based upon information furnished by the System, concerning the Retirement System's 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.

We have assessed that the contribution rate calculated under the current funding policy is a reasonable Actuarially Determined Employer Contribution (ADEC) and it is consistent with the plan accumulating adequate assets to make benefit payments when due.

This report was prepared using assumptions pending adoption by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. The combined effect of the assumptions, excluding prescribed assumptions or methods set by law, is expected to have no significant bias (i.e., not significantly optimistic or pessimistic). All actuarial assumptions and methods used in the valuation follow the guidance in the applicable Actuarial Standards of Practice. Additional information about the actuarial assumptions is included in the section of this report entitled Summary of Actuarial Cost Method and Assumptions.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

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 Madison Heights Police and Fire Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and with applicable statutes.

The signing actuaries are independent of the plan sponsor. Gabriel, Roeder, Smith & Company would be pleased to review this valuation report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

Heidi G. Barry, ASA, FCA, MAAA

Kevin T. Noelke, ASA, FCA, MAAA

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SECTION A

VALUATION RESULTS

City's Computed Contributions
for the Fiscal Year Beginning July 1, 2025

Contributions Expressed as Percents of Annual Pay								
Contributions for	Department Heads	Police Command	Police Other	Fire Command	Fire Other	Totals	Base Totals	Change Due to Revised Assumptions
NORMAL COST								
Age and service pensions	26.68 %	16.94 %	15.07 %	18.71 %	17.06 %	**16.79** %	17.26 %	(0.47) %
Disability pensions	1.25	1.21	1.10	1.29	1.31	**1.20**	1.25	(0.05)
Death pensions	0.16	0.12	0.10	0.17	0.14	**0.13**	0.14	(0.01)
Totals	28.09	18.27	16.27	20.17	18.51	**18.12**	18.65	(0.53)
MEMBERS' CONTRIBUTIONS								
Gross contributions	8.90	8.90	7.68	7.55	6.90	**7.72**	7.73	(0.01)
Less prospective refunds	0.37	0.93	0.84	0.30	0.25	**0.62**	0.52	0.10
Available for pensions	8.53	7.97	6.84	7.25	6.65	**7.10**	7.21	(0.11)
CITY'S NORMAL COST	19.56	10.30	9.43	12.92	11.86	**11.02**	11.44	(0.42)
UNFUNDED ACTUARIAL ACCRUED LIABILITIES*								
Retirees and beneficiaries						**16.48**	16.91	(0.43)
Active members						**21.45**	20.54	0.91
Totals						**37.93**	37.45	0.48
CITY'S TOTAL CONTRIBUTION (PENSIONS)						**48.95** %	48.89 %	0.06 %
Administrative and Investment Expenses						**7.31** %	7.31 %	0.00 %
CITY'S TOTAL CONTRIBUTION (PENSIONS & EXPENSES)						**56.26** %	56.20 %	0.06 %

* *Financed as a level percent-of-payroll over a closed period of 20 years.*

Note: This report reflects assumption changes described on pages A-6 through A-8, pending Board approval.

Comparative Statement

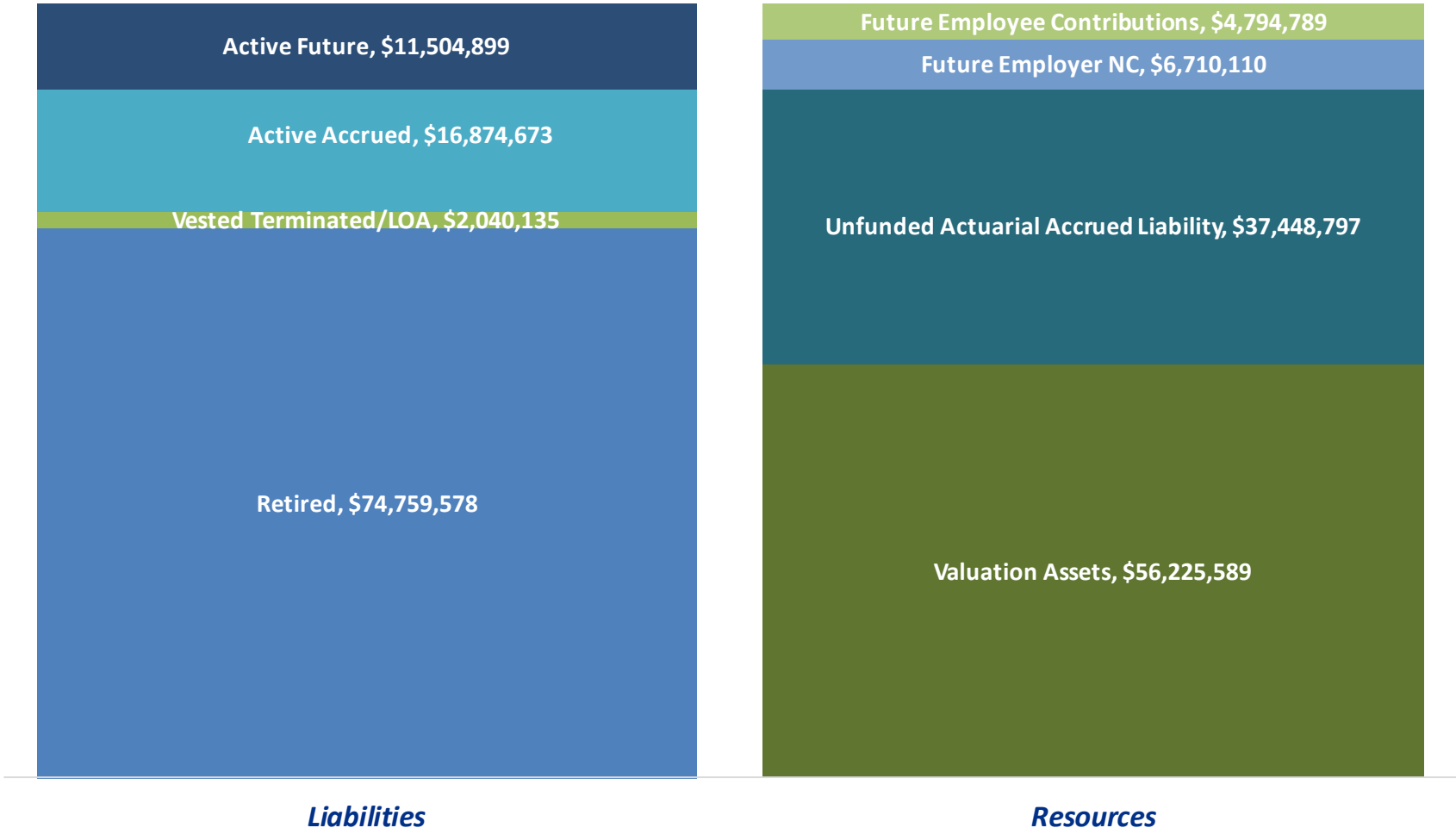
Valuation Date June 30	Fiscal Year	Actuarial Accrued Liabilities & Reserves	Funding Value of Assets	Funded Status	Unfunded Actuarial Accrued Liabilities & Reserves			City's Contribution Rate		
									Dollars	
					Dollars	Amortiz. Period	% of Payroll	Percents	Recommended	Actual
2004 *#	05-06	$ 56,133,839	$ 48,976,377	87.2 %	$ 7,157,462	20	102.4 %	23.15 %	$ 1,618,638	$ 1,656,681
2005	06-07	57,733,862	49,887,362	86.4	7,846,500	19	110.3	23.86	1,697,809	1,794,618
2006 @	07-08	59,879,584	51,533,008	86.1	8,346,576	25	118.2	22.88	1,615,365	1,745,795
2007	08-09	61,959,805	55,004,366	88.8	6,955,439	25	96.3	21.90	1,581,304	1,625,338
2008 *	09-10	61,187,814	57,130,630	93.4	4,057,184	25	53.4	17.48	1,327,971	1,589,770
2009 @	10-11	63,175,083	56,156,781	88.9	7,018,302	30	93.6	18.82	1,411,463	1,391,859
2010	11-12	63,161,498	54,888,388	86.9	8,273,110	30	120.9	19.92	1,363,478	1,240,859
2011 #	12-13	65,466,348	51,374,542	78.5	14,091,806	30	234.5	22.72	1,365,401	1,338,103
2012	13-14	67,929,700	47,691,751	70.2	20,237,949	30	356.5	27.82	1,711,368	1,566,747
2013 **	14-15	67,745,324	48,067,300	71.0	19,678,024	30	335.4	24.99	1,588,802	1,408,153
2014 @	15-16	70,493,480	49,322,706	70.0	21,170,774	30	380.7	27.94	1,683,896	1,698,569
2015 *#	16-17	78,426,714	47,383,538	60.4	31,043,176	29	587.7	39.35	2,252,379	2,473,172
2016 *	17-18	77,750,883	45,546,957	58.6	32,203,926	28	586.4	41.10	2,393,830	2,698,592
2017 *	18-19	81,945,548	44,678,218	54.5	37,267,330	27	673.5	48.04	2,809,141	3,262,859
2018 *	19-20	83,976,488	42,974,487	51.2	41,002,001	26	766.1	54.40	3,065,746	3,166,522
2019 *	20-21	90,142,843	43,297,793	48.0	46,845,050	25	815.5	59.68	3,596,592	3,923,348
2020	21-22	91,106,124	43,903,038	48.2	47,203,086	24	796.8	59.10	3,673,090	3,910,244
2021 **	22-23	91,573,936	47,180,918	51.5	44,393,018	23	717.1	54.70	3,569,689	6,953,304
2022	23-24	91,719,060	46,873,248	51.1	44,845,812	22	791.4	59.71	3,606,957	10,147,597 ^
2023 **	24-25	91,110,574	50,068,640	55.0	41,041,934	21	707.6	56.12	3,470,219	
2024	**25-26**	**93,215,519**	**56,225,589**	**60.3**	**36,989,930**	**20**	**580.3**	**48.89**	**3,322,242**	
2024 *	**25-26**	**93,674,386**	**56,225,589**	**60.0**	**37,448,797**	**20**	**587.5**	**48.95**	**3,326,319**	

** Revised actuarial assumptions and methods.*
*** Changes in the application of the benefit provisions.*
^ Includes State Pension Grant of $3,631,364.
 # Retirement System was amended.
@ Amortization policy of Unfunded Actuarial Accrued Liability was changed.

The Ratio of Funding Value of Assets to Actuarial Accrued Liabilities 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%, although this trend can be interrupted by experience losses. The Ratio of Unfunded Actuarial Accrued Liability to Valuation Payroll is another relative index of condition. Unfunded Actuarial Accrued Liability represent debt, while active member payroll represents the system's capacity to collect contributions to pay toward the debt. The lower the ratio, the greater the financial strength and vice-versa.

Actuarial Balance Sheet
as of June 30, 2024

Liabilities and Resources, $105,179,285



Reserves, Assets, and Unfunded Actuarial Accrued Liability

In determining the Unfunded Actuarial Accrued Liability, the Funding Value of Assets and actuarial accrued liabilities were distributed as shown below. Please see page B-3 for information concerning the reporting of assets, and page B-4 for the development of the Funding Value of Assets.

Reserve for	Reserves Allocated on a MVA Basis to Active Member & Terminated Vested Actuarial Accrued Liabilities	Reserves Allocated on a MVA Basis to Retired Life Actuarial Liabilities	Reported Reserves Totals
Employees Contributions	$ 4,350,151		$ 4,350,151
Employer Contributions	(23,742,559)	$ 59,547,422	35,804,863
Retired Benefit Payments		15,212,156	15,212,156
Undistributed Investment Income			
Totals, as reported	$ (19,392,408)	$ 74,759,578	$ 55,367,170

	Retired Lives	Active & Term. Vested Members	Totals
Computed Actuarial Accrued Liabilities	$ 74,759,578	$ 18,914,808	$ 93,674,386
Funding Value of Assets	56,225,589	-	56,225,589
Unfunded Actuarial Accrued Liabilities	$ 18,533,989	$ 18,914,808	$ 37,448,797

Derivation of Experience Gain (Loss)
Year Ended June 30, 2024

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is hoped that aggregate gains and losses will cancel each other over a period of years, but sizeable 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)	Unfunded Actuarial Accrued Liability at start of year	$ 41,041,934
(2)	Employer normal cost from the last valuation	671,108
(3)	Actual employer contributions (excluding "Additional" contributions)	3,482,830
(4)	Interest accrual: [(1) + 1/2 [(2) - (3)]] x .0675	2,675,435
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	$ 40,905,647
(6)	Change in benefit provisions	-
(7)	Change from the revised actuarial assumptions and methods	458,867
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 41,364,514
(9)	Actual UAAL at end of year	37,448,797
(10)	Gain (loss): (8) - (9)	$ 3,915,717
(11)	Actuarial accrued liability at the start of the year	$ 91,110,574
(12)	Total Gain (loss) as a percent of actuarial accrued liabilities at start of year	**4.3%**
	Gain (loss) attributed to Investments	*0.1%*
	Gain (loss) attributed to Liabilities	*(3.0)%*
	Gain (loss) attributed to Additional contributions	*7.2%*

Valuation Date June 30,	Aggregate Experience Gain (Loss) as a Percentage of Beginning-of-Year Actuarial Accrued Liability
2015	(4.6) %
2016	(2.3)
2017	(3.8)
2018	(1.7)
2019	(0.8)
2020	0.3
2021	2.9
2022	(0.9)
2023	4.5
2024	4.3

Comments, Recommendation and Conclusion

Comment A: The overall actuarial experience was more favorable than expected as shown on page A-5, primarily due to the following:

- **A gain** due to additional employer contributions and the State Pension Grant. As a result, actual contributions were approximately $6.5M higher than expected. The additional employer contribution and State Pension Grant increased the funded status and decreased the FYE 2026 contribution by approximately 3-4% each;
- **A gain** due to favorable investment experience on the basis of the Funding Value of Assets. Market performance from 2021 to 2024 was smoothed over four years by the Board's use of an asset smoothing technique for the purpose of adding more stability to the City's contribution rate;
- **A loss** due to lower retiree mortality than expected (1 death vs. 4.9 expected);
- **A loss** due to higher benefits at retirement than expected for 6 new retirees;
- **A loss** due to more retirements than expected (6 retirements vs. 1.5 expected); and
- **A loss** due to higher salary increases among active members than expected (8.74% actual vs. 4.46% expected).

Comment B: An experience review of the five-year period from July 1, 2019 to June 30, 2024 was performed in conjunction with this valuation. The following summarizes the findings and provides the recommendations for the Board's consideration at the November 12, 2024 Board meeting.

Economic Assumptions

Price Inflation: While this assumption has no direct impact on the results in this valuation, price inflation is a key component of the underlying wage inflation and interest rate assumptions. We recommend maintaining the current price inflation assumption of 2.50%.

Wage Inflation: Wage inflation consists of a component due to pure price inflation (CPI) and a component due to increases in average salary levels in excess of pure price inflation. Given our recommendation for a 2.50% price inflation assumption and the historical pay increases above CPI for this plan in the last five years, we recommend maintaining the current wage inflation assumption of 3.25%.

Investment Return: Our analysis is based on the GRS Capital Market Assumption Modeler (CMAM). Because GRS is a benefit consulting firm and does not develop or maintain capital market expectations, we request and monitor forward-looking expectations developed by several major forecasting firms. The current version of ASOP No. 27 suggests that the expected geometric return (i.e., 50th percentile) or the expected arithmetic return can be suitable for use as a reasonable investment return assumption. Based on the average of each of the forecasters' expectations, this would result in a range of 6.43% to 7.09% for the Retirement System for this valuation.

Given that the current assumption of 6.75% is within this range, the Board may wish to maintain this assumption. The higher the investment return assumption, the less margin that will exist for actuarial standards reasonability purposes in future years if capital market expectations are lowered from their current levels. In other words, if capital market assumptions are lowered from current levels, it may become necessary to lower the investment return assumption prior to the next experience review. The Actuarial Standards of Practice require the investment return assumption to be reviewed on an annual basis.

Comments, Recommendation and Conclusion

Merit and Seniority Pay Increases: The rates used in this valuation are based on a correlation with age. Actual increases were higher than current rates for ages under 30 for the study period. We, therefore, recommend adjustments to the assumed salary rate increases.

The recommended changes in merit and seniority pay increases are not included in this report. It is our understanding that the Board does not wish to make changes to the economic assumptions at this time. The Board will consider adopting the recommended merit and seniority pay increases for the 2025 valuation. This will increase the required contribution and lower the funded status of the plan.

Demographic Assumptions

Mortality: The actual number of pre-retirement deaths for the study period was more than expected (1 actual versus 0.5 expected). The actual number of post-retirement deaths for the study period was less than expected (16 actual versus 22.0 expected). Membership in this plan is not sufficiently large to set mortality expectations for the future. Therefore, we recommend the continued use of the Pub-2010 amount-weighted safety tables, in conjunction with updating the projection scale to the MP-2021 projection scale on a fully generational basis. Updating the projection scale from MP-2020 to MP-2021 would decrease liabilities slightly and increase the funded status of the plan slightly.

Retirement Rates: The actual number of retirements was more than expected during the study period (19 actual versus 6.7 expected). We, therefore, recommend a general increase in these rates. Our recommended retirement pattern is shown on page C-4. This change will increase the required contribution and lower the funded status of the plan.

Withdrawal Rates: The actual number of withdrawals from active membership was more than expected during the study period (23 actual versus 12.0 expected). We, therefore, recommend a general increase in these rates. Our recommended withdrawal pattern is shown on page C-5. This change will decrease the required contribution and increase the funded status of the plan.

Disability Rates: The actual number of disability retirements from active membership was less than expected during the study period (0 actual versus 1.1 expected). Given the low amount of experience for this assumption, we do not recommend any changes to these rates.

Liability Adjustments: Active liabilities are adjusted by a "load" due to retirement benefits being higher at retirement than projected. The current load is set to 20% for Department Heads and 5% for all other groups. Actual liabilities were approximately 5.3% higher than projected for the 19 retirements during the study period. We, therefore, do not recommend any changes to the loads at this time. It is important to monitor this assumption each valuation in case we need to revisit this assumption prior to the next experience review.

Amortization Period/Funding Policy: Please see Comment E. We believe the current funding policy and closed amortization period of 20 years is reasonable. However, given the funded status of the plan, a lower amortization period such as 10 or 15 years could be considered in order to accelerate funding progress.

Comments, Recommendation and Conclusion

Asset Valuation Method: This valuation uses a four-year asset smoothing method. Valuation Assets recognize assumed investment income fully each year, and differences between actual and assumed investment income are phased-in over a closed four-year period. We do not recommend any changes to this method. However, we recommend establishing a "corridor" around the Market Value of Assets of 80% to 120%, so that the Funding Value of Assets does not deviate from the Market Value of Assets by an unreasonably large amount. This change would not affect the required contribution or funded status reflected in this valuation.

Optional Forms of Payment: If a retiring member elects an optional form of benefit, the assumed benefit is multiplied by the appropriate option factor to produce the benefit actually payable. Currently, option factors for survivor benefits are calculated using the 1971 Group Annuity Mortality Table and a 7.00% interest assumption. Given the longer life expectancies projected by more recent mortality assumptions, the Board may wish to consider updating this assumption. While this change would not have an immediate impact on the funded status of the plan, a more recent mortality assumption would likely produce less of a reduction and therefore a higher payable benefit to retirees who elect optional forms of payment. If the Board wishes, GRS would be happy to provide a separate analysis of updating the optional forms of payment.

The aforementioned recommendations would increase the City's FYE 2026 contribution rate from 48.89% (excluding expenses) to 48.95% and lower the funded status from 60.3% to 60.0%.

Comment C: The contribution rate in this valuation would increase from 48.95% to 49.89% of payroll (excluding expenses) if it were based on a market value basis. The ratio of the Funding Value of Assets to the Market Value of Assets is 101.6%. Unrecognized losses due to asset smoothing from 2022 are scheduled to be recognized in the next valuation, putting upward pressure on contribution rates. However, portions of favorable returns from 2023 and 2024 are scheduled to be recognized as well, which will somewhat offset this pressure.

Comment D: A 20-year closed amortization period was used for this valuation. Historical funded statuses are shown on page A-2. As of June 30, 2024, the Retirement System's funded status is 60.0% compared to 55.0% as of June 30, 2023. On a market value basis, the funded status would be 59.1% compared to 52.4% last year.

Comments, Recommendation and Conclusion

Comment E: The retiree liability is only 76.1% funded. In addition, the amortization period (currently 20 years) exceeds the average expected future lifetime of the current retired members (which is approximately 19 years). We recommend that the Board consider lowering the amortization period for at least the portion of the unfunded liability attributable to retiree liability.

For comparison, the table below provides the computed contribution rates if the unfunded retiree liabilities were to be amortized over a shorter time period. Based on the current funding policy, the retiree liabilities are projected to be fully funded in approximately 10 years and the Retirement System is projected to be 60% funded in the next few years.

Amortization Period		
Unfunded Retiree Liability	Unfunded Remaining Liability	Contribution Rate
10 years	20 years	60.75%
15	20	52.85%
20	20	48.95%

Comment F: This valuation does not include funding requirements for retiree health care benefits (the biennial valuation is submitted in a separate report).

Conclusion: The City's contributions (member contributions are additional) to the City of Madison Heights Police and Fire Retirement System, for the fiscal year beginning July 1, 2025, have been computed to be 48.95% of active member payroll for pensions with an additional 7.31% for administrative and investment expenses.

It is the actuary's opinion that the required contribution rates determined by this actuarial valuation are sufficient to meet the Retirement System's funding objective, presuming the ongoing financial viability of the plan sponsor.

We commend the Board and the City for the additional employer contribution of $3.0 million in an effort to increase the funded status. There is still a concern regarding potential cash flow problems for the Retirement System, which is still complicated by the Annuity Withdrawal provisions causing large disbursements over short periods of time.

The assets in the Plan are not sufficient to cover current retiree liabilities and the ratio of assets (Market Value) to retiree benefit payroll is about eight. This means that approximately eight years of retiree benefit payments can be paid from current assets; the ability to make such payments beyond that period is heavily dependent upon future contributions and future investment return. Please take the time to read pages A-10, A-11 and A-12 which cover in more detail the risks the Retirement System is exposed to and the limits of what is within our control.

Low-Default-Risk Obligation Measure

Introduction

In December 2021, the Actuarial Standards Board (ASB) adopted a revision to Actuarial Standard of Practice (ASOP) No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*. The revised ASOP No. 4 requires the calculation and disclosure of a liability referred to by the ASOP as the "Low-Default-Risk Obligation Measure" (LDROM). The rationale that the ASB cited for the calculation and disclosure of the LDROM was included in the Transmittal Memorandum of ASOP No. 4 and is presented below (emphasis added):

> "The ASB believes that the calculation and disclosure of this measure provides **appropriate, useful information for the intended user regarding the funded status of a pension plan**. The calculation and disclosure of this additional measure is **not intended to suggest that this is the "right" liability measure** for a pension plan. However, the ASB does believe that **this additional disclosure provides a more complete assessment of a plan's funded status and provides additional information regarding the security of benefits that members have earned as of the measurement date.**"

Comparing the Accrued Liabilities and the LDROM

One of the fundamental financial objectives of the Retirement System is to finance each member's retirement benefits over the period from the member's date of hire until the member's projected date of retirement (entry age actuarial cost method) as a level percentage of payroll. To fulfill this objective, the discount rate that is used to value the accrued liabilities of the Retirement System is set equal to the **expected return** on the System's diversified portfolio of assets (referred to sometimes as the investment return assumption). For the Police and Fire Retirement System, the investment return assumption is 6.75%.

The LDROM is meant to approximately represent the lump sum cost to a plan to purchase low-default-risk fixed income securities whose resulting cash flows essentially replicate in timing and amount the benefits earned (or the costs accrued) as of the measurement date. The LDROM is very dependent upon market interest rates at the time of the LDROM measurement. The lower the market interest rates, the higher the LDROM, and vice versa. The LDROM results presented in this report are based on the entry age actuarial cost method and discount rates based upon the June 2024 Treasury Yield Curve Spot Rates (end of month). The 1-, 5-, 10- and 30-year rates follow: 5.12%, 4.34%, 4.22% and 4.45%. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures (Valuation and LDROM) is one illustration of the savings the sponsor anticipates by taking on risk in a diversified portfolio:

Valuation Accrued Liabilities	LDROM
$93,674,386	$121,165,412

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 6.75% on the Funding Value of Assets), it is expected that:

1) The Unfunded Actuarial Accrued Liability will be fully amortized after 20 years;
2) The funded status of the plan will increase gradually towards 100%; and
3) The unfunded accrued liability will increase for an extended period before beginning to decline. This is particularly true when the plan sponsor is contributing on a percent-of-payroll basis and there is no payroll growth.

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 Funding Value of Assets. Unless otherwise indicated, with regard 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, in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
3) The measurement would produce a different result if the Market Value of Assets were used instead of the Funding Value of Assets, unless the Market Value of Assets 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 entity 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.

Risks to Future Employer Contribution Requirements

There are ongoing risks to future employer contribution requirements to which the Retirement System is exposed, such as:

- Actual and Assumed Investment Rate of Return
- Actual and Assumed Mortality Rates
- Amortization Policy

Risk Measures Summary ($ in Thousands)

Valuation Date (6/30)	(1) Actuarial Accrued Liabilities (AAL)	(2) Market Value of Assets	(3) Market Value Unfunded AAL	(4) Valuation Payroll	(5) Market Value Funded Ratio (2)/(1)	(6) Retiree Liabilities (RetLiab)	(7) RetLiab / AAL (6)/(1)	(8) AAL / Payroll (1)/(4)	(9) Assets / Payroll (2)/(4)	(10) Portfolio Standard Deviation*	(11) Standard Deviation as % of Pay (9)x(10)	(12) Unfunded AAL / Payroll (3)/(4)	(13) Non-Investment Cash Flow (NICF)	(14) NICF / Assets (13)/(2)	(15) Market Rate of Return	(16) 5-Year Trailing Geometric Average
2015	$ 78,427	$ 45,922	$ 32,505	$ 5,282	58.6%	$ 51,644	65.8%	1,484.8%	869.4%	14.7%	111.4%	658.1%	(3,757)	-9.0%	0.0%	6.4%
2016	77,751	41,606	36,145	5,492	53.5%	54,304	69.8%	1,415.7%	757.6%	12.6%	96.5%	715.4%	(3,853)	-9.1%	-1.1%	4.7%
2017	81,946	42,365	39,581	5,533	51.7%	58,239	71.1%	1,481.0%	765.7%	14.1%	112.4%	771.9%	(3,221)	-7.5%	10.0%	5.6%
2018	83,976	42,665	41,311	5,352	50.8%	61,722	73.5%	1,569.1%	797.2%	13.8%	110.0%	771.9%	(3,243)	-7.6%	8.7%	6.3%
2019	90,143	43,441	46,702	5,744	48.2%	64,092	71.1%	1,569.3%	756.3%	13.2%	99.8%	813.1%	(1,849)	-4.3%	6.3%	4.7%
2020	91,106	42,711	48,395	5,924	46.9%	64,794	71.1%	1,537.9%	721.0%	13.0%	93.7%	816.9%	(2,065)	-4.8%	3.1%	5.3%
2021	91,574	52,001	39,573	6,191	56.8%	64,300	70.2%	1,479.1%	839.9%	12.2%	102.5%	639.2%	(1,178)	-2.3%	24.9%	10.3%
2022	91,719	43,320	48,399	5,666	47.2%	68,435	74.6%	1,618.8%	764.6%	12.2%	93.3%	854.2%	(2,519)	-5.8%	-12.1%	5.5%
2023	91,111	47,741	43,370	5,800	52.4%	69,597	76.4%	1,570.9%	823.1%	10.9%	89.7%	747.8%	678	1.4%	8.6%	5.5%
2024	93,674	55,367	38,307	6,374	59.1%	74,760	79.8%	1,469.6%	868.6%	12.0%	103.8%	601.0%	2,587	4.7%	10.3%	6.3%

** Standard deviation of expected 1-year return based on the System's asset allocation and capital market assumptions shared with us by various investment consultants.*

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

(6) and (7) The ratio of Retiree liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system.

(8) and (9) The ratios of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(10) and (11) The portfolio standard deviation measures the volatility of investment return. When multiplied by the ratio of assets to payroll it gives the effect of a one standard deviation asset move as a percent of payroll. This figure helps users understand the difficulty of dealing with investment volatility and the challenges volatility brings to sustainability. This ratio is likely to increase as the plan approaches full funding.

(12) The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

(13) and (14) The ratio of Non-Investment Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately 4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(15) and (16) Investment return is probably the largest single risk that most systems face. The year-by-year return and the 5-year geometric average both give an indication of the reasonableness of the system's assumed return. Of course, past performance is not a guarantee of future results. Market rate shown is based on actuarial estimation method and may differ from figures provided by the System's investment consultant.

SECTION B

SUMMARY OF BENEFIT PROVISIONS, ASSETS AND VALUATION DATA

Brief Summary of Act 345 Benefit Provisions as of June 30, 2024

Eligibility	Amount
Service Retirement	
Members hired after 7/1/2009 (excluding Dept. Heads) Age 52 with 25 or more years of service, age 55 with 15 or more years of service, or age 60 with 10 years of service.	Straight life pension equals 2.0% (2.5% if member has at least 25 years of service for all members or age 60 with 10 years of service for Fire Fighters (including Command)) of 3-year Average Final Compensation (AFC) times the first 25 years of service plus 1.0% of AFC times years of service in excess of 25 years.
Dept. Heads before 7/1/2019 and Other Members hired before 7/1/2009 25 or more years of service regardless of age or age 60 with 10 years of service.	Straight life pension equals 2.0% (2.8% if member has at least 25 years of service for all members or age 60 with 10 years of service for Fire Fighters (including Command)) of 3-year AFC times first 25 years of service plus 1.0% of AFC times years of service in excess of 25 years.

Department Heads promoted into the bargaining unit after July 1, 2019 have benefits as provided in the Police Command or Fire Fighters contract.

Deferred Retirement	
10 or more years of service.	Computed as service retirement but based upon service, AFC and benefits in effect at termination. Benefit begins at the date retirement would have occurred had the member remained in employment.

Members hired after July 1, 2009 who leave the City prior to:

- Age 52 (with at least 25 years of service) are eligible to commence benefits at age 52;
- Age 55 (with at least 15 years of service, but less than 25 of service) are eligible to commence benefits at age 55; and
- Age 60 (with at least 10 years of service, but less than 15 of service) are eligible to commence benefits at age 60.

Death after Retirement Survivor's Pension	
Payable to a surviving spouse, if any, upon the death of a retired member who was receiving a straight life pension which was effective July 1, 1975 or later.	Spouse's pension equals 60% of the straight life pension the deceased retiree was receiving.
Non-Duty Death-in-Service Survivor's Pension	
Payable to a surviving spouse, if any, upon the death of a member with 20 or more years of service.	Accrued straight life pension actuarially reduced in accordance with an Option I election.

Brief Summary of Act 345 Benefit Provisions as of June 30, 2024

Eligibility	Amount

Duty Death-in-Service Survivor's Pension

Payable upon the expiration of Workers' Compensation to the survivors of a member who died in the line of duty.	Same amount that was paid by Workers' Compensation.

Non-Duty Disability

Payable upon the total and permanent disability of a member with 5 or more years of service.	**To earliest projected service retirement eligibility:** 1.5% of AFC times years of service. **At earliest projected service retirement eligibility:** Same as Service Retirement Pension.

Duty Disability

Payable upon the total and permanent disability of a member in the line of duty.	**To earliest projected service retirement eligibility:** 50% of AFC. **At earliest projected service retirement eligibility:** Same as Service Retirement Pension with service credit from the date of disability to projected age of retirement eligibility.

Member Contributions

Fire Fighters (including Command): 8.90% if hired before 7/1/2009 and 6.90% if hired after 7/1/2009. Police (non-Command): 8.90% if hired before 7/1/2019 and 6.90% if hired after 7/1/2019. Police Command: 8.90% if hired before 7/1/2019 and 6.90% if hired after 7/1/2019. Department Heads: 8.90% if in the union prior to 7/1/2019 and benefits as provided in the Police Command or Fire Fighters contract if promoted into the union after 7/1/2019.

Annual Interest Earned on Member Contributions

Department Heads: 3.50% if in the union prior to 7/1/2019. All others: 0.00% effective 1/1/2020.

Annuity Withdrawal

Members retiring with 25-years of service may elect to receive a refund of accumulated contributions including interest. Upon election, the members pension is reduced by the actuarial equivalent of the refunded contributions. Actuarial equivalence is based on the Merrill Lynch Bond Index available at retirement.

Frozen Contributions Available for Annuity Withdrawal

Department Heads in the union prior to July 1, 2019 do not have a frozen amount. Department Heads promoted into the union after July 1, 2019 have benefits as provided in the Police Command or Fire Fighters contract. Police Command: For members in the union as of July 1, 2019 the amount is frozen as of June 30, 2022. All other members have an amount that was frozen prior to the valuation date. Effective July 1, 2019, annuity withdrawal was eliminated for new hires.

Summary of Current Asset Information Furnished for the Valuation

Balance Sheet

Current Assets (Market Value)		Reserve for	
Cash	$ 5,799,351	Employees Contributions	$ 4,350,151
Accrued Interest & Dividends	75,887	Employer Contributions	35,804,863
Common Stocks	34,476,628	Retired Benefit Payments	15,212,156
Stock Mutual Funds	-	Undistributed Investment Income	-
U.S. Government Bonds	3,986,839		
Corporate Bonds	4,043,820		
Mortgages	-		
Agency Bonds	2,152,111		
Asset Backed Securities	4,493,585		
Contributions Receivable	338,949		
Accounts Payable	-		
Total Current Assets	$ 55,367,170	Total Reserves, as reported	$ 55,367,170

Receipts and Disbursements

		2023-24	2022-23
Balance - July 1,		$ 47,741,202	$ 43,320,267
Receipts:			
Employees contributions		477,488	490,130
	- for EE service purchase	-	54,813
Employer contributions		3,482,830	3,503,304
	- Additional Contributions	3,033,403	3,450,000
	- State Pension Grant	3,631,364	-
	- for admin. & inv. expenses	241,983	442,307
Investment income		5,263,071	3,742,714
Disbursements:			
Benefit payments		5,919,366	5,224,823
Refund of member contributions		1,302,459	811,432
Retiree health insurance		48,687	49,627
Administrative expenses		241,983	227,442
Investment expenses		224,248	214,865
Other (Taxes)		767,425	734,144
Adjustment		(3)	-
Balance June 30,		$ 55,367,170	$ 47,741,202
Gross rate of investment return		10.8%	8.6%

Development of Funding Value of Retirement System Assets

Year Ended June 30:	2022	2023	2024	2025	2026	2027
(A) Funding Value Beginning of Year	$ 47,180,918	$ 46,873,248	$ 50,068,640			
(B) Market Value End of Year	43,320,267	47,741,202	55,367,170			
(C) Market Value Beginning of Year	52,000,810	43,320,267	47,741,202			
(D) Non Investment Net Cash Flow	(2,519,179)	678,221	2,587,148			
(E) Investment Income:						
(E1) Market Total: B-C-D	(6,161,364)	3,742,714	5,038,820			
(E2) Assumed Rate	6.75%	6.75%	6.75%			
(E3) Amount for Immediate Recognition E2 * (A + D/2)	3,099,690	3,186,834	3,466,949			
(E4) Amount for Phased-In Recognition: E1-E3	(9,261,054)	555,880	1,571,871			
(F) Phased-In Recognition Investment Income:						
(F1) From Current Year = .25 x (E3)	(2,315,264)	138,970	392,968			
(F2) First Year Prior	1,886,177	(2,315,264)	138,970	$ 392,968		
(F3) Second Year Prior	(379,548)	1,886,177	(2,315,264)	138,970	$ 392,968	
(F4) Third Year Prior	(79,546)	(379,546)	1,886,178	(2,315,262)	138,970	$ 392,967
(F5) Total Recognized Investment Gain	(888,181)	(669,663)	102,852	(1,783,324)	531,938	392,967
(G) Funding Value End of Year						
(G1) Preliminary Funding Value End of Year = (A) + (D) + (E3) + (F5)			$ 56,225,589			
(G2) Upper Corridor Limit: 120% x (B)			66,440,604			
(G3) Lower Corridor Limit: 80% x (B)			44,293,736			
(G4) Final Funding Value End of Year	**$ 46,873,248**	**$ 50,068,640**	**$ 56,225,589**			
(H) Difference between Market & Funding Value	(3,552,981)	(2,327,438)	(858,419)			
(I) Recognized Rate of Return	4.8%	5.3%	7.0%			
(J) Ratio of Funding Value of Assets to Market Value	108.2%	104.9%	101.6%			
(K) Market Rate of Return	(12.1)%	8.6%	10.3%			

The Funding Value of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed four-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.

Retirees and Beneficiaries Added to and Removed from Rolls
Comparative Statement

Year Ended June 30	Added to Rolls		Removed from Rolls		Rolls End of Year				% Incr. in Annual Pensions	Average Pension	Present Value of Pensions
	No.	Annual Pensions	No.	Annual Pensions	No.	Active Per Retired	Annual Pensions Dollars	Annual Pensions % of Pay			
2005	1	$ 23,232	3	$ 79,834	101	1.0	$ 2,880,929	40.5 %	(1.9) %	$ 28,524	$ 30,919,712
2006	3	170,036	1	3,880	103	0.9	3,047,085	43.2	5.8	29,583	32,399,560
2007	2	93,031	4	83,266	101	0.9	3,056,850	42.3	0.3	30,266	32,176,238
2008	5	78,960	4	114,827	102	0.9	3,020,983	39.8	(1.2)	29,617	30,142,812
2009	3	82,044	1	25,502	104	0.9	3,077,525	41.0	1.9	29,592	30,340,870
2010	5	142,333	4	104,122	105	0.8	3,115,736	45.5	1.2	29,674	30,412,190
2011	12	634,045	2	32,757	115	0.7	3,717,024	61.9	19.3	32,322	37,300,027
2012	7	440,833	2	27,202	120	0.6	4,130,655	72.8	11.1	34,422	41,541,931
2013	4	195,238	4	148,883	120	0.6	4,177,010	71.2	1.1	34,808	41,555,510
2014	4	223,638	-	-	124	0.5	4,400,648	79.1	5.4	35,489	43,344,843
2015	11	483,755	4	73,399	131	0.5	4,811,004	91.1	9.3	36,725	51,643,558
2016	8	401,007	4	108,444	135	0.5	5,103,567	92.9	6.1	37,804	54,304,406
2017	6	300,680	-	-	141	0.5	5,404,247	97.7	5.9	38,328	58,238,711
2018	8	361,468	3	101,965	146	0.5	5,663,750	105.8	4.8	38,793	61,722,141
2019	1	14,104	1	23,507	146	0.5	5,654,347	98.4	(0.2)	38,728	64,091,619
2020	8	218,553	4	115,196	150	0.5	5,757,704	97.2	1.8	38,385	64,793,630
2021	4	109,154	3	97,246	151	0.5	5,769,611	93.2	0.2	38,209	64,300,299
2022	9	403,331	2	33,966	158	0.5	6,138,976	108.3	6.4	38,854	68,434,580
2023	6	330,397	6	173,934	158	0.5	6,295,439	108.5	2.5	39,845	69,596,758
2024	**7**	**498,889**	**1**	**24,456**	**164**	**0.5**	**6,769,872**	**106.2**	**7.5**	**41,280**	**74,759,578**

Note: Number counts exclude Alternate Payees whose benefits are paid based on the life of the member (their associated benefits are included in the totals).

Retirees and Beneficiaries as of June 30, 2024
Tabulated by Type of Pensions Being Paid

Type of Pensions Being Paid	Number	Annual Pensions
Age and Service Pensions		
Regular pensions - benefit terminating at death of retiree	26	$ 944,675
Regular pensions - automatic 60% to spouse	90	4,816,604
Regular pension - survivor	30	547,637
Option 1 pension	3	138,765
Option 2 pension - modified joint and survivor benefit	-	-
Total age and service pensions	149	$ 6,447,681
Casualty Pensions		
Duty disability pensions	4	$ 102,750
Non-duty disability pensions	3	89,570
Duty disability pension - survivor	4	47,019
Non-duty disability pension - survivor	-	-
Duty death pension - survivor	2	57,600
Non-duty death pensions - survivor	2	25,252
Total casualty pensions	15	$ 322,191
Total Pensions Being Paid	**164**	**$ 6,769,872**

Note: Number counts exclude Alternate Payees whose benefits are paid based on the life of the member (their associated benefits are included in the totals).

Retirees and Beneficiaries as of June 30, 2024
Tabulated by Attained Ages

Attained Ages		Annual Pensions
35 - 39	1	$ 43,116
40 - 44	1	14,484
45 - 49	3	185,299
50 - 54	15	880,313
55 - 59	23	1,210,227
60 - 64	24	1,203,847
65 - 69	21	989,552
70 - 74	18	755,910
75 - 79	18	626,727
80 - 84	19	421,645
85 - 89	11	323,988
90 - 94	8	102,792
100 - 104	2	11,972
Totals	**164**	**$ 6,769,872**

Note: Number counts exclude Alternate Payees whose benefits are paid based on the life of the member (their associated benefits are included in the totals).

Vested Terminated Members as of June 30, 2024*
Tabulated by Attained Ages

Attained Ages	No.	Estimated Annual Pensions
40 - 44	2	$ 34,812
45 - 49	2	34,927
50 - 54	3	99,489
Totals	**7**	**$ 169,228**

* *Includes members currently on leave of absence from service.*

Active Members Included in Valuation by Division

Division	No.	Valuation Payroll	Average Pay
Police - Command	11	$ 1,058,550	$ 96,232
- Other	35	2,656,432	75,898
Fire - Command	10	936,896	93,690
- Other	20	1,473,117	73,656
Department Heads	2	249,284	124,642
Totals	**78**	**$ 6,374,279**	**$ 81,722**

Active Members Added to and Removed from Rolls

Year Ended June 30	Number Added During Year		Terminations										Active Members End of Year
			Normal Retirement		Disabled		Died-in-Service		Withdrawal				
									Vested	Other	Total		
	A	E	A	E	A	E	A	E	A	A	A	E	
2005	0	2	0	0.5	0	0.2	0	0.1	0	2	2	1.9	96
2006	1	3	3	0.4	0	0.3	0	0.1	0	0	0	1.6	94
2007	1	3	1	0.5	0	0.3	0	0.1	0	2	2	1.4	92
2008	0	0	0	0.4	0	0.3	0	0.1	0	0	0	1.3	92
2009	0	2	1	0.6	0	0.3	1	0.1	0	0	0	1.1	90
2010	0	8	1	0.6	1	0.4	0	0.2	0	6	6	1.0	82
2011	3	10	10	2.1	0	0.3	0	0.2	0	0	0	0.8	75
2012	4	9	7	1.5	0	0.3	0	0.2	2	0	2	0.7	70
2013	5	3	2	1.0	0	0.3	0	0.2	1	0	1	0.8	72
2014	2	6	4	3.0	0	0.3	0	0.1	0	2	2	1.3	68
2015	7	9	6	3.6	2	0.2	0	0.1	1	0	1	1.0	66
2016	13	7	6	2.8	0	0.1	0	0.0	0	1	1	1.4	72
2017	8	9	5	3.0	0	0.2	0	0.1	1	3	4	2.1	70
2018	8	8	5	2.3	0	0.2	0	0.1	0	3	3	2.1	70
2019	6	2	0	0.2	0	0.1	0	0.0	0	2	2	2.2	74
2020	9	4	2	0.2	0	0.2	0	0.1	1	1	2	2.2	79
2021	8	6	0	0.0	0	0.3	1	0.1	0	5	5	2.5	81
2022	8	13	6	2.5	0	0.2	0	0.1	1	6	7	2.4	76
2023	10	12	5	2.4	0	0.2	0	0.1	1	6	7	2.4	74
2024	12	10	6	1.6	0	0.2	0	0.1	0	2	2	2.5	78
5-Yr. Totals	**47**	**45**	**19**	**6.7**	**0**	**1.1**	**1**	**0.5**	**3**	**20**	**23**	**12.0**	
Expected for 2025				**2.6**		**0.1**		**0.1**				**3.5**	

A = actual
E = expected

Active Members in Valuation
Comparative Schedule

Valuation Date June 30	No.	Valuation Payroll	Average Pay	% Incr.	Age	Service
2005	96	$ 7,115,713	$ 74,122	3.9 %	39.9 yrs.	12.6 yrs.
2006	94	7,060,160	75,108	1.3	40.2	13.0
2007	92	7,220,564	78,484	4.5	41.0	13.8
2008	92	7,597,087	82,577	5.2	42.0	14.8
2009	90	7,499,803	83,331	0.9	43.1	15.8
2010	82	6,844,767	83,473	0.2	44.1	16.8
2011	75	6,009,688	80,129	(4.0)	44.0	16.6
2012	70	5,676,851	81,098	1.2	43.8	16.2
2013	72	5,867,119	81,488	0.5	43.8	15.8
2014	68	5,561,732	81,790	0.4	44.2	16.3
2015	66	5,282,238	80,034	(2.1)	43.0	14.7
2016	72	5,491,632	76,273	(4.7)	41.1	12.4
2017	70	5,533,353	79,048	3.6	40.3	11.6
2018	70	5,352,132	76,459	(3.3)	39.3	10.8
2019	74	5,744,170	77,624	1.5	39.6	11.1
2020	79	5,923,918	74,986	(3.4)	39.1	10.4
2021	81	6,190,826	76,430	1.9	39.0	10.7
2022	76	5,666,485	74,559	(2.4)	38.1	9.9
2023	74	5,800,416	78,384	5.1	38.0	9.2
2024	78	6,374,279	81,722	4.3	37.2	7.8

Active Members as of June 30, 2024
by Near Age and Years of Service

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	2							2	$ 143,924
25-29	16	1						17	1,222,661
30-34	7	11						18	1,375,893
35-39	4	7	3					14	1,118,870
40-44	2	4	1	1				8	665,036
45-49	1	2			4			7	685,173
50-54	2	1	2		3	1		9	848,230
55-59					3			3	314,492
Totals	**34**	**26**	**6**	**1**	**10**	**1**		**78**	**$ 6,374,279**

Group Averages:

Age:	37.2 years
Service:	7.8 years
Annual Pay:	$81,722

SECTION C

SUMMARY OF ACTUARIAL COST METHOD AND ASSUMPTIONS

Actuarial Cost Method

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

Financing of Unfunded Actuarial Accrued Liability. The Unfunded Actuarial Accrued Liability (the portion of total liabilities not covered by present assets or expected future normal cost contributions) was amortized by level (principal or interest combined) percent-of-payroll contributions over a closed period of 20 years for the contribution rate beginning July 1, 2025.

Actuarial Assumptions

The actuary calculates the contribution requirements and benefit values of the Retirement System by applying actuarial assumptions to the benefit provisions and people information furnished, using the actuarial cost method described on the previous page. All actuarial assumptions used in this report are estimates of future experience, not market measures.

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

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

In making a valuation, the actuary calculates the monetary effect of each assumption 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 Retirement System will not coincide exactly with assumed experience, regardless of the wisdom of the assumptions, or the skill of the actuary and the precision of the many calculations made. 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

The rate of investment return was 6.75% a year, compounded annually (gross of investment and administrative expenses). This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time. This assumption was first used for the June 30, 2019 valuation. Experience over the last five years has been as illustrated below:

	Year Ending June 30,					5-Year
	2024	2023	2022	2021	2020	Average
1) Recognized rate*	7.0 %	5.3 %	4.8 %	10.3 %	6.3 %	6.7 %
2) Increase in CPI	3.0	3.0	9.1	5.4	0.6	4.2
3) Average salary increase	8.7	9.1	1.8	2.1	1.9	4.7
4) Real return						
- investment purposes	4.0	2.3	(4.3)	4.9	5.7	2.5
- funding purposes	(1.7)	(3.8)	3.0	8.2	4.4	2.0

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

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.

	Salary Increase Assumptions for an Individual Member		
Sample Ages	Merit & Seniority	Base (Economic)	Increase Next Year
20	3.00 %	3.25 %	6.25 %
25	3.00	3.25	6.25
30	2.60	3.25	5.85
35	1.10	3.25	4.35
40	0.20	3.25	3.45
45	0.20	3.25	3.45
50	0.20	3.25	3.45
55	0.10	3.25	3.35
60	0.00	3.25	3.25

If the number of active members remains constant, then the total active member payroll will increase 3.25% annually, the base portion of the individual salary increase assumptions. This increasing payroll was recognized in amortizing the Unfunded Actuarial Accrued Liability. The wage inflation assumption is 3.25% and was first used for the June 30, 2019 valuation.

Price inflation is not directly used in the valuation. For purposes of assessing the reasonableness of the assumed rate of return, we assumed price inflation of 2.50% per year. This assumption was first used for the June 30, 2019 valuation.

Actuarial Assumptions

The mortality table used to measure post-retirement mortality is the Pub-2010, Amount Weighted, Safety, Healthy Retiree tables for males and females. The corresponding Disabled and Employee tables were used to measure Disabled mortality and Pre-Retirement mortality, respectively. A base year of 2010 with future mortality improvements using scale MP-2021 was used. Additional margin for future mortality improvements are included in the projection scale. This assumption was first used for the June 30, 2019 valuation. The future mortality improvement scale was first use for the June 30, 2024 valuation. Sample post retirement rates follow:

Sample Ages in 2024	Single Life Retirement Values			
	Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
	Males	Females	Males	Females
45	$165.90	$168.08	40.79	42.90
50	159.79	162.39	35.65	37.69
55	151.66	154.92	30.60	32.58
60	141.29	145.58	25.70	27.66
65	128.70	134.23	21.09	23.00
70	113.78	120.43	16.79	18.60
75	96.57	104.13	12.87	14.52
80	77.92	86.16	9.43	10.89

For purposes of the pre-retirement death benefit, it was assumed that 100% of members were married at the time of death. 25% of pre-retirement deaths were assumed to be duty related.

Probabilities of retirement for members eligible to retire were:

Hired Before July 1, 2009			Hired On or After July 1, 2009		
Retirement Ages	Percent of Active Members Retiring within Next Year		Retirement Ages	Percent of Active Members Retiring within Next Year	
	Police	Fire & Dept. Heads		Police	Fire & Dept. Heads
45	50 %	20 %	52	62.5 %	50 %
46	50	20	53	47.5	30
47	50	20	54	47.5	30
48	50	20	55	47.5	30
49	50	20	56	47.5	30
50	50	30	57	47.5	30
51	50	50	58	47.5	30
52	50	50	59	47.5	30
53	50	50	60	100.0	100
54	50	50			
55	50	60			
56	50	70			
57	50	70			
58	50	80			
59	50	90			
60	100	100			

These assumptions were first used for the June 30, 2024 valuation.

Actuarial Assumptions

Sample Rates of Withdrawal from active employment before retirement, other than death or disability are shown below:

Sample Ages	Years of Service	% of Active Members Separating within Next Year	
		Police	Fire & Dept. Heads
ALL	0	15.00 %	5.00 %
	1	10.00	4.00
	2	8.50	3.00
	3	6.00	2.00
	4	4.00	2.00
25	5 & Over	6.00	3.50
30		5.10	2.90
35		4.10	1.50
40		2.85	0.60
45		1.74	0.50
50		0.00	0.50
55		0.00	0.50
60		0.00	0.50

These assumptions were first used for the June 30, 2024 valuation.

Sample Rates of Disability are shown below. 50% of disabilities were assumed to be duty related.

Sample Ages	Probabilities of Becoming Disabled During Next Year	
	Males	Females
20	0.07 %	0.03 %
25	0.09	0.05
30	0.10	0.07
35	0.14	0.13
40	0.21	0.19
45	0.32	0.28
50	0.52	0.45
55	0.92	0.76
60	1.53	1.10

Actuarial Assumptions

The Value of $1,000/month Retirement Benefit to an Individual Who Retires at Age 50 in an **Inflationary Environment** of 2.50% price inflation is shown below:

Age	Value
50	$ 1,000
51	976
52	952
53	929
54	906
55	884
60	781
65	690
70	610
75	539
80	477
85	421

Miscellaneous and Technical Assumptions

Marriage Assumption	100% of members are assumed to be married for purposes of death-in-service benefits. 90% of members are assumed to be married at time of retirement for purposes of death after retirement benefits. Male spouses are assumed to be three-years older than females.
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 at the middle of the 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.
Benefit Service	Exact fractional service is used to determine the amount of benefit payable.
Decrement Relativity	Decrement rates are used directly from tabular rates, without adjustment for multiple decrement table effects.
Decrement Operation	Disability and mortality decrements do not operate during the first five years of service. Disability and separation do not operate during retirement eligibility.
Normal Form of Benefit	The assumed normal form of benefit is straight life for single members and joint and 60% survivor for married members.
Loads	Normal Retirement Present Values were loaded by 5% of age and service actuarial liabilities for Police and Fire hired before July 1, 2009 and 20% of age and service actuarial liabilities for Department Heads hired before July 1, 2009 for lump sums payable at retirement.
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. New entrant normal cost contributions are applied to the funding of new entrant benefits.
Annuity Withdrawal	It was assumed that 100% of all future retirees will elect to withdraw their employee contributions at retirement resulting in a corresponding reduction to the monthly annuity. A 1.98% interest rate assumption was used to determine the annuity equivalent of the member contribution balance at retirement. This assumption was first used for the June 30, 2021 valuation and is based on the last available annuity withdrawal interest rate.
Data Adjustments	Base salary amounts were used for new active members who did not have annualized pay reported.

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	Also referred to as the Actuarial Value of Assets, smoothed Market Value of Assets, or valuation assets. Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over a closed four-year period. During periods when investment performance exceeds the assumed rate, valuation assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, valuation assets will tend to be greater than market value. If assumed rates are exactly realized for three consecutive years, valuation assets will become equal to market value.

Glossary

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.

Plan Termination Liability The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for the future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

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.

UAAL (Unfunded Actuarial Accrued Liability) The difference between the Actuarial Accrued Liability and the Funding Value of Assets. Sometimes referred to as "unfunded accrued liability."

Most retirement systems have Unfunded Actuarial Accrued Liability. An amount arises each time new benefits are added and each time an experience loss occurs.

The existence of Unfunded Actuarial Accrued Liability is not in itself bad, any more than a mortgage on a house is bad. Unfunded Actuarial Accrued Liability does not represent a debt that is payable today. What is important is the ability to control the amount of Unfunded Actuarial Accrued Liability and the trend in the amount (after due allowance for devaluation of the dollar).

SECTION D

BASIC FINANCIAL OBJECTIVE AND OPERATION OF THE RETIREMENT SYSTEM

Basic Financial Objective and Operation of the Retirement System

Benefit Promises Made Which Must Be Paid For. A retirement system 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 system acquires a unit of service credit each member is, 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."

Section 9(2) of Act 345 is also directed to the question:

> "Sec. 9(2). - - - For the purpose of creating and maintaining a fund for the payment of the pensions and other benefits payable hereunder the said city, village or municipality, subject to the provisions of this act, shall appropriate, at the end of such regular intervals as may be adopted, quarterly, semi-annually, or annually, an amount sufficient to maintain actuarially determined reserves covering pensions payable or which might be payable on account of service performed and to be performed by active members and pensions being paid retired members and beneficiaries - - - ."

This retirement system meets this constitutional requirement by having as its ***financial objective to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year*** and will not have to be increased for future generations of taxpayers.

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

> ***Normal Cost*** (the current value of benefits likely to be paid on account of members' service being rendered in the current year)
>
> ... plus ...
>
> ***Interest on the Unfunded Actuarial Accrued Liability*** (the difference between the Actuarial Accrued Liability and current system assets)
>
> ... plus ...
>
> ***Payment on the Unfunded Actuarial Accrued Liability*** (principal payments shall be determined using an amortization period of 30 years or less).

While this may meet a level percent-of-payroll contribution objective for an open plan, regular consideration should be given to increasing payments on the Unfunded Actuarial Accrued Liability until 100% funded status is reached.

Basic Financial Objective and Operation of the Retirement System

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. ***Invested assets are a by-product of level percent-of-payroll contributions, not the objective***. Investment income becomes a major contributor to the retirement system and the amount is directly related to the amount of contributions and investment performance.

If contributions to the retirement system 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

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

The aggregate amount of **C**ontributions received on behalf of the group

... plus ...

Investment earnings on contributions received and not required for immediate payment of benefits

... minus ...

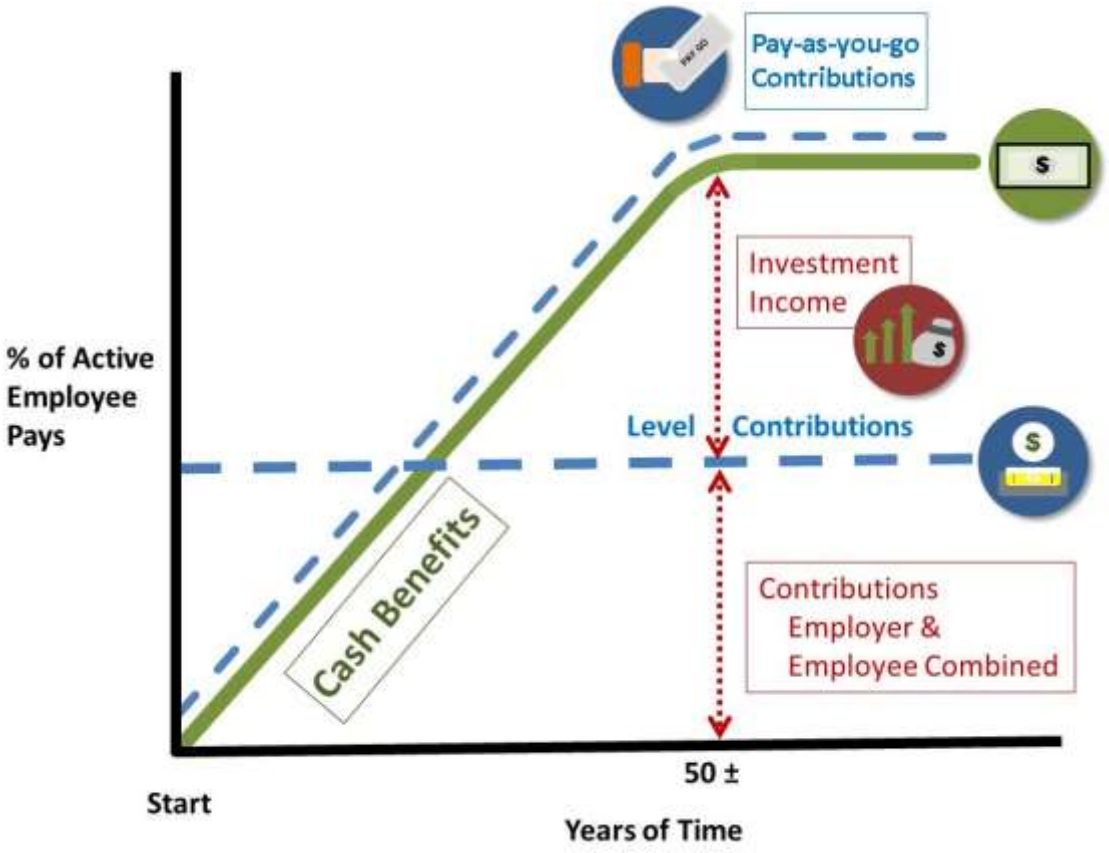
The **E**xpenses of operating the program.

There are retirement systems designed to defer the bulk of contributions far into the future. Lured by artificially low present contributions, the inevitable consequence of a relentlessly increasing contribution rate -- to a level greatly in excess of the level percent-of-payroll rate -- is ignored.

This method of financing is prohibited in Michigan by the state constitution.

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

Basic Financial Objective and Operation of the Retirement System



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