City of Battle Creek
Police and Fire Retirement System

Sixty-Second Actuarial Valuation Report

June 30, 2024

June 30, 2024 Actuarial Valuation
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800.521.0498 | P: 248.799.9000 | www.grsconsulting.com

November 27, 2024

Retirement Board
City of Battle Creek
Police and Fire Retirement System
Battle Creek, Michigan

Dear Board Members:

The results of the June 30, 2024 Annual Actuarial Valuation of the City of Battle Creek Police and Fire Retirement System are presented in this report.

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 the valuation are to measure the System's funding progress and to determine the employer contribution rate for the fiscal year ending June 30, 2026. Information required by Statement Nos. 67 and 68 of the Governmental Accounting Standards Board (GASB) are provided in a separate report. 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 amount in this report is determined using the actuarial methods and assumptions disclosed in Section C of this report. This report includes risk metrics beginning on page A-18 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the System's financial condition.

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 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. The valuation was based upon information furnished by the City, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the City.

This report was prepared using assumptions adopted by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. The combined effect of the assumptions 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 Section C of this report.

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.

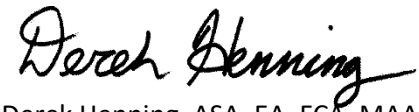
This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the City of Battle Creek Police and Fire Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Derek Henning, Abra D. Hill and Brad Lee Armstrong are Members of the American Academy of Actuaries (MAAA) and meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,
Gabriel, Roeder, Smith & Company



Derek Henning, ASA, EA, FCA, MAAA

Abra D. Hill, ASA, FCA, MAAA

Brad Lee Armstrong, ASA, EA, FCA, MAAA

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SECTION A

VALUATION RESULTS, COMMENTS, RECOMMENDATIONS, AND CONCLUSIONS

Financial Objective

The financial objective of the Retirement System is 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 citizens. This objective meets the requirements of Act No. 345 of the Public Acts of 1937, as amended, and the Michigan constitution.

Contribution Rates

The Retirement System is supported by member contributions, City contributions and investment income from Retirement System assets.

Contributions which are intended to satisfy the financial objective are determined by an annual actuarial valuation and are sufficient to:

(1) Cover the actuarial present value of benefits assigned to the current year by the actuarial cost methods described in Section C (the normal cost); and

(2) Amortize over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

Computed contributions for the fiscal year beginning July 1, 2025 are shown on page A-2.

Contributions Computed to Meet the Financial Objective of the Retirement System

Contributions for	Contributions Expressed as Percents-of-Payroll	
Fiscal Year Beginning July 1	**2025**	**2024**
Normal Cost		
Age and service benefits	25.03 %	24.91 %
Death and disability benefits	1.99 %	2.00 %
Termination benefits		
Deferred age & service benefits	2.64 %	2.66 %
Refunds of member contributions	0.75 %	0.76 %
Total Normal Cost	30.41 %	30.33 %
Amortization Payment/(Credit) *	19.18 %	19.96 %
Total Contribution Requirement	49.59 %	50.29 %
Less average member portion	12.07 %	12.01 %
City portion	37.52 %	38.28 %

** Amortization of unfunded actuarial accrued liabilities is described on page C-5.*

Please refer to page A-3 for information on the determination of the amortization payment.

A procedure for determining dollar contribution amounts is described on page A-4.

Comparative contribution amounts for prior fiscal years are shown on page A-6.

Sources and Financing of Unfunded Actuarial Accrued Liability

Year Established	Initial Years	Years Remaining	Unf'd. Act. Accr. Liab. (UAAL) Initial Amount	Current Amount	Fiscal Year Beginning 2025 Projected UAAL	Amortization Factor	Amortization Payment	% of Payroll Contribution
Initial Unfunded								
2022	25	23	$ 51,720,601	$ 51,883,783	$ 52,380,370	16.9788	$ 3,085,054	18.22 %
Benefit Changes								
2007	30	13	4,422,379	4,678,497	4,594,741	10.8293	424,286	2.51
2008	30	14	390,603	421,777	416,088	11.5194	36,121	0.21
2009	30	15	121,354	132,095	130,230	12.1915	10,682	0.06
2014	30	18	(135,876)	(149,973)	(149,226)	14.1053	(10,579)	(0.06)
2016	30	18	954,398	1,016,053	1,015,457	14.1053	71,991	0.43
2017	30	18	1,322,624	1,388,899	1,387,990	14.1053	98,402	0.58
2018	30	18	(111,600)	(114,995)	(115,435)	14.1053	(8,184)	(0.05)
2019	30	18	(11,845)	(11,195)	(11,895)	14.1053	(843)	0.00
2020	30	18	(174,306)	(174,360)	(173,450)	14.1053	(12,297)	(0.07)
2021	30	18	(27,406)	(27,537)	(27,571)	14.1053	(1,955)	(0.01)
2022	15	13	(31,003)	(28,588)	(28,688)	10.8293	(2,649)	(0.02)
2023	15	14	(146,358)	(155,505)	(153,417)	11.5194	(13,318)	(0.08)
Experience Changes								
2023	20	19	1,456,264	1,547,281	1,549,524	14.7105	105,334	0.62
2024	20	20	(7,705,035)	(7,705,035)	(8,186,600)	15.3001	(535,069)	(3.16)
Assumption Changes								
Totals		**21.59**		**$52,701,197**	**$52,628,118**		**$3,246,976**	**19.18 %**

Projection of the Unfunded Actuarial Accrued Liability

The Unfunded Actuarial Accrued Liability is projected from the valuation date to the fiscal year beginning July 1, 2025 by reflecting the expected amortization payment and interest accrual for the fiscal year beginning July 1, 2024. The expected amortization payment was computed as 19.96% of payroll in the June 30, 2023 valuation. The expected dollar amortization payment was calculated as 19.96% of the $15,808,780 valuation payroll increased with the wage inflation assumption of 3.50%.

(1)	Current UAAL	$52,701,197
(2)	Expected $ Amortization Payment	3,265,875
(3)	Interest Accrual	3,192,796
(4)	**Projected UAAL (1) - (2) + (3)**	**$52,628,118**

Determining Dollar Contributions

For any period of time, the percent-of-payroll contribution rate needs to be converted to dollar amounts. We recommend the following procedure.

Contribute dollar amounts at the end of each payroll period which are equal to the City's percent-of-payroll contribution requirement 37.52% multiplied by the covered active member payroll for the period. Adjustments should be made as necessary to exclude items of pay that are not covered compensation for Retirement System benefits and to include special payments that are covered compensation (overtime, longevity pay, etc.).

The above amounts are assumed to be contributed, on average, halfway through the fiscal year. If contributions are made on a later schedule, interest should be added at the rate of 0.51% for each month of delay.

Valuation Results
Comparative Statement
($ Amounts in Thousands)

Valuation Date June 30	(1) Valuation Assets	(2) Member Payroll	(3) AAL ^	(4) UAAL ^	Funded Ratio (1) / (3)
1994@	$ 54,518	$ 8,357	$ 53,344	$ (1,174)	102.2 %
1995#	59,906	9,104	60,373	467	99.2 %
1996	65,885	9,834	65,549	(336)	100.5 %
1997	72,134	10,039	70,033	(2,101)	103.0 %
1998	79,796	9,813	73,270	(6,526)	108.9 %
1999	87,618	9,750	76,230	(11,388)	114.9 %
2000	95,548	11,235	81,667	(13,881)	117.0 %
2001	101,191	11,615	85,536	(15,655)	118.3 %
2002*	103,951	11,908	92,955	(10,996)	111.8 %
2003#	103,656	11,885	97,858	(5,798)	105.9 %
2004	103,746	12,114	101,773	(1,973)	101.9 %
2005	102,756	12,085	107,850	5,094	95.3 %
2006	103,283	12,284	114,501	11,218	90.2 %
2007#	108,245	12,358	121,823	13,578	88.9 %
2008#	113,286	12,497	126,752	13,466	89.4 %
2009*	112,094	11,954	133,053	20,959	84.2 %
2010	112,804	12,383	137,557	24,753	82.0 %
2011	115,775	12,610	140,864	25,089	82.2 %
2012	115,083	12,270	145,541	30,458	79.1 %
2013	117,879	11,701	149,005	31,126	79.1 %
2014#	125,527	12,656	154,038	28,511	81.5 %
2015*	131,758	13,496	166,935	35,177	78.9 %
2016#	135,408	13,471	171,939	36,531	78.8 %
2017*#	140,243	14,216	184,652	44,409	76.0 %
2018#	145,749	14,324	192,915	47,166	75.6 %
2019*#	149,653	14,199	195,637	45,984	76.5 %
2020*#	154,625	14,617	204,208	49,584	75.7 %
2021#	165,872	14,259	210,849	44,976	78.7 %
2022*#	170,222	14,954	229,419	59,196	74.2 %
2023#	174,441	16,991	235,094	60,653	74.2 %
2024	181,523	15,809	234,224	52,701	77.5 %

* *After changes in actuarial assumptions or methods.*
\# *After changes in benefit provisions.*
^ *Prior to the 6/30/2006 valuation, actuarial present value of credited projected benefits was used.*
@ *Assets shown are net of health assets beginning in 1994.*

Short Condition Test – Comparative Statement

The Short Condition Test is another way of looking at a system's progress under its funding program based on the entry-age accrued liability. In a short condition test, the plan's valuation assets are compared with: 1) Active member contributions on deposit; 2) The liabilities for future benefits to present retired lives; and 3) The liabilities allocated to service already rendered by active members. In a system that has been following the discipline of level percent-of-payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by valuation assets (except in rare circumstances). In addition, the liabilities assigned to service already rendered by active members (liability 3) will be partially covered by the remainder of the valuation assets. The larger the funded portion of liability 3, the stronger the condition of the system. Liability 3 being fully funded is uncommon.

The following schedule illustrates the history of liabilities 1, 2 and 3.

Val. Date June 30	Actuarial Accrued Liability ^			Valuation Assets	Portion of Present Values Covered by Assets		
	(1) Active Member Contributions	(2) Retirees & Beneficiaries	(3) Active & Inactive Members (Employer Financed)		(1)	(2)	(3)
2005	$ 9,474,647	$62,017,507	$36,357,438	$102,755,663	100%	100%	86%
2006	10,309,119	62,976,517	38,560,107	103,283,413	100%	100%	78%
2007#	10,990,190	67,946,355	42,886,868	108,245,308	100%	100%	68%
2008#	11,173,085	71,090,277	44,488,843	113,285,618	100%	100%	70%
2009*	10,939,230	79,883,240	42,230,347	112,094,168	100%	100%	50%
2010	11,664,234	80,725,431	45,167,594	112,804,385	100%	100%	45%
2011	11,687,246	85,197,066	43,979,382	115,774,764	100%	100%	43%
2012	11,676,628	91,012,108	42,852,215	115,083,128	100%	100%	29%
2013	11,058,220	96,565,549	41,381,230	117,879,023	100%	100%	25%
2014#	11,386,585	98,326,146	44,325,246	125,526,809	100%	100%	36%
2015*	11,991,306	107,510,592	47,433,443	131,757,916	100%	100%	26%
2016#	12,869,644	106,715,647	52,353,595	135,407,676	100%	100%	30%
2017*#	13,607,875	110,428,262	60,616,061	140,243,417	100%	100%	27%
2018#	12,883,095	118,343,985	61,687,848	145,748,585	100%	100%	24%
2019*#	13,204,916	120,707,301	61,725,047	149,652,941	100%	100%	26%
2020*#	13,362,456	125,300,489	65,545,260	154,624,610	100%	100%	24%
2021#	11,839,644	135,492,647	63,516,328	165,872,221	100%	100%	29%
2022*#	11,400,903	144,872,870	73,145,097	170,222,451	100%	100%	19%
2023#	13,079,984	146,086,534	75,927,433	174,441,102	100%	100%	20%
2024	12,844,057	151,243,665	70,136,481	181,523,006	100%	100%	25%

** After changes in actuarial assumptions or methods.*
 # After changes in benefit provisions.
^ Prior to the 6/30/2006 valuation, present value of credited projected benefits was used.

Total Computed and Actual City Contributions
Comparative Statement

Fiscal Year	Valuation Date June 30	Actual Dollar Contribution @	Valuation Payroll	City's Computed %-of-Payroll Contributions
1996/97	1995	$2,447,857	$ 9,103,643	25.09%
1997/98	1996	2,862,874	9,834,167	23.81%
1998/99	1997	2,188,572	10,039,322	21.80%
1999/00	1998	2,005,241	9,813,441	13.65%
2000/01	1999	1,590,027	9,749,682	12.68%
2001/02	2000	1,748,678	11,235,312	13.37%
2002/03	2001	1,571,015	11,615,098	12.12%
2003/04	2002 *	2,720,559	11,907,553	21.54%
2004/05	2003 #	2,922,144	11,885,130	23.70%
2005/06	2004	3,108,229	12,114,360	23.91%
2006/07	2005	3,540,775	12,085,192	26.28%
2007/08	2006 *	3,617,333	12,283,787	23.33%
2008/09	2007#	3,908,721	12,358,265	23.77%
2009/10	2008#	3,622,270	12,497,433	23.93%
2010/11	2009*	4,346,195	11,953,735	26.67%
2011/12	2010	4,159,617	12,383,339	27.85%
2012/13	2011	4,105,429	12,609,794	27.80%
2013/14	2012	4,316,203	12,269,834	30.12%
2014/15	2013	4,612,446	11,700,630	31.10%
2015/16	2014#	4,664,957	12,656,141	29.21%
2016/17	2015*	4,728,234	13,495,955	29.89%
2017/18	2016#	5,180,487	13,470,636	31.01%
2018/19	2017*#	5,544,586	14,216,474	33.36%
2019/20	2018#	5,869,972	14,324,168	34.61%
2020/21	2019*#	6,353,070	14,198,563	35.17%
2021/22	2020*#	6,368,077	14,616,971	35.60%
2022/23	2021#	6,323,009	14,258,999	34.87%
2023/24	2022*#	6,140,034	14,953,589	41.34%
2024/25	2023#	NA	16,990,750	38.28%
2025/26	2024	NA	15,808,780	37.52%

* *After changes in actuarial assumptions or methods.*
\# *After plan amendment.*
@ *Includes post-retirement health care beginning 1993/1994.*

Schedule of Employer Contributions

Year Ended June 30	Annual Required Contribution / Actuarially Determined Contribution
2005	$ 1,824,879
2006	2,458,298
2007	2,990,893
2008	3,617,333
2009	3,408,721
2010	3,116,270
2011	3,846,195
2012	3,659,617
2013	3,592,634
2014	3,803,408
2015	3,594,446
2016	4,164,957
2017	4,228,234
2018	4,680,487
2019	5,060,534
2020	5,441,963
2021	6,021,762
2022	6,063,482
2023	6,051,642
2024	6,140,034

The annual required contributions/actuarially determined contributions shown in the Schedule of Employer Contributions are the actual contributions made by the City in the fiscal year.

Development of Funding Value of Assets

Year Ended June 30	2021	2022	2023	2024	2025	2026	2027	2028
A. Funding Value Beginning of Year	$154,624,610	$165,872,221	$170,222,451	$174,441,102				
B. Market Value End of Year	186,019,846	157,926,951	168,798,632	186,239,714				
C. Market Value Beginning of Year	154,958,172	186,019,846	157,926,951	168,798,632				
D. Non-Investment Net Cash Flow	(4,304,931)	(4,622,585)	(5,598,252)	(5,371,923)				
E. Investment Income								
E1. Market Total: B - C - D	35,366,605	(23,470,310)	16,469,933	22,813,005				
E2. Assumed Rate of Investment Return	6.50%	6.50%	6.25%	6.25%	6.25%			
E3. Amount for Immediate Recognition	9,910,689	10,631,460	10,463,958	10,734,696				
E4. Amount for Phased-In Recognition: E1-E3	25,455,916	(34,101,770)	6,005,975	12,078,309				
F. Phased-In Recognition of Investment Income								
F1. Current Year: 0.20 x E4	$5,091,183	(6,820,354)	1,201,195	2,415,662				
F2. First Prior Year	(168,556)	5,091,183	(6,820,354)	1,201,195	$ 2,415,662			
F3. Second Prior Year	49,478	(168,556)	5,091,183	(6,820,354)	1,201,195	$ 2,415,662		
F4. Third Prior Year	189,606	49,478	(168,556)	5,091,183	(6,820,354)	1,201,195	$ 2,415,662	
F5. Fourth Prior Year	480,142	189,604	49,477	(168,555)	5,091,184	(6,820,354)	1,201,195	$ 2,415,661
F6. Total Recognized Investment Gain	$ 5,641,853	$ (1,658,645)	$ (647,055)	$ 1,719,131	$ 1,887,687	$ (3,203,497)	$ 3,616,857	$ 2,415,661
G. Funding Value End of Year:								
G1. Preliminary Funding Value End of Year: A+D+E3+F6	165,872,221	170,222,451	174,441,102	181,523,006				
G2. Upper Corridor Limit: 120% x B	223,223,815	189,512,341	202,558,358	223,487,657				
G3. Lower Corridor Limit: 80% x B	148,815,877	126,341,561	135,038,906	148,991,771				
G4. Funding Value End of Year	**$165,872,221**	**$170,222,451**	**$174,441,102**	**$181,523,006**				
H. Difference between Market & Funding Value: B-G4	20,147,625	(12,295,500)	(5,642,470)	4,716,708				
I. Recognized Rate of Return	10.20%	5.49%	5.86%	7.25%				
J. Market Rate of Return	23.14%	(12.78)%	10.62%	13.73%				

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 five-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 four consecutive years, the Funding Value will become equal to Market Value.

Actuarial Balance Sheet – June 30

Present Resources and Expected Future Resources

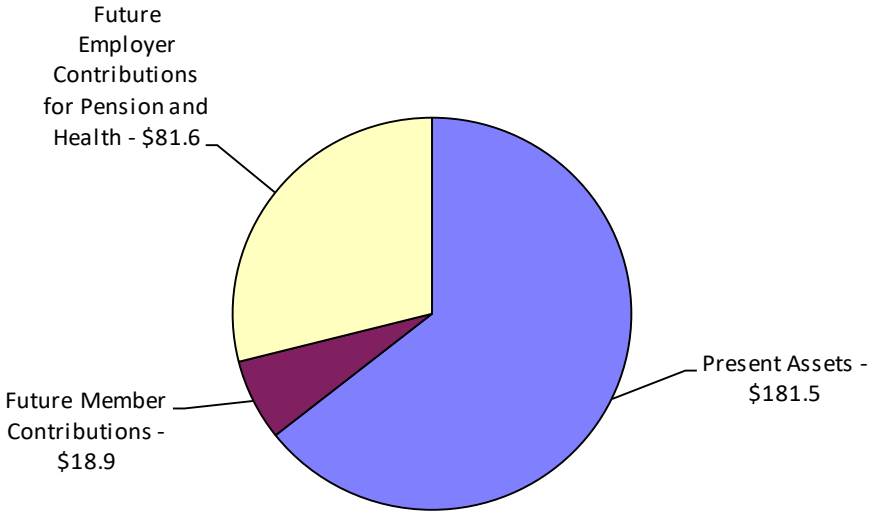
	2024	2023
A. Valuation assets		
1. Net assets from System financial statements (market value)	$186,239,714	$168,798,632
2. Valuation adjustment	(4,716,708)	5,642,470
3. Valuation assets	181,523,006	174,441,102
B. Actuarial present value of expected future employer contributions		
1. For normal costs	28,930,768	30,683,342
2. For unfunded actuarial accrued liabilities	52,701,197	60,652,849
3. Total	81,631,965	91,336,191
C. Actuarial present value of expected future member contributions	18,881,024	19,897,277
D. Reserves	148,295	0
E. Total Actuarial Present Value of Present and Expected Future Resources	$282,035,995	$285,674,570

Actuarial Present Value of Expected Future Benefit Payments and Reserves

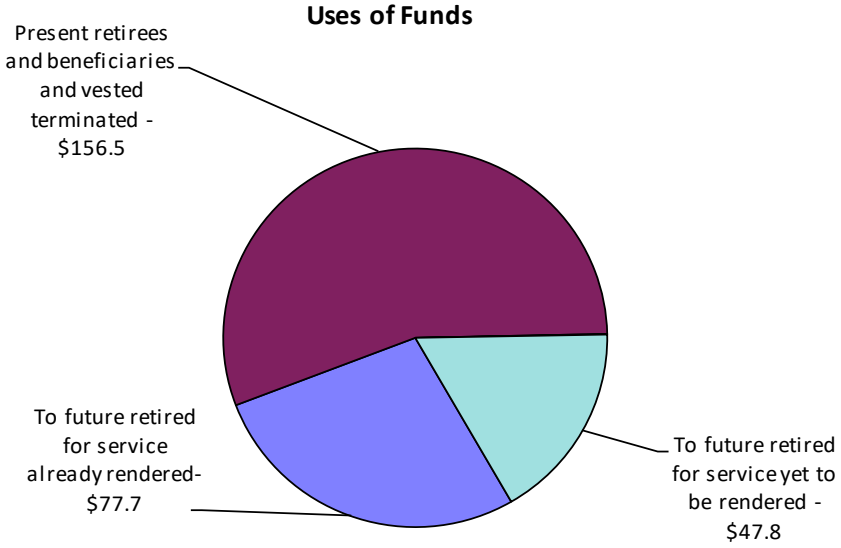
A. To retirees and beneficiaries	$151,243,665	$146,086,534
B. To terminated members	5,157,163	4,181,040
C. To present active members		
1. Allocated to service rendered prior to valuation date	77,675,080	84,826,377
2. Allocated to service likely to be rendered after valuation date	47,811,792	50,580,619
3. Total	125,486,872	135,406,996
D. Total Actuarial Present Value of Expected Future Pension Payments	281,887,700	285,674,570
E. Reserves		
1. Allocated to retirees and beneficiaries	0	0
2. Post-Retirement Health Care	148,295	0
3. Total	148,295	0
F. Total Actuarial Present Value of Expected Future Benefit Payments and Reserves	$282,035,995	$285,674,570

Financing $282.0 Million of Benefit Promises
June 30, 2024

Sources of Funds



Uses of Funds



Derivation of Actuarial Gain (Loss)
Year Ended June 30

The actuarial gains or losses realized in the operation of the Retirement System provide an experience test. Gains and losses are expected to cancel each other over a period of years (in the absence of double-digit inflation) and sizable year-to-year fluctuations are common. Details of the derivation of the actuarial gain (loss) are shown below, along with a year-by-year comparative schedule.

	2024	2023
(1) UAAL* at start of year	$60,652,849	$59,196,419
(2) Employer normal cost	3,221,650	2,951,457
(3) Expected Employer contributions to finance:		
Employer normal cost	3,221,650	2,951,457
UAAL	3,916,275	3,446,633
Total	7,137,925	6,398,090
(4) Interest accrual	3,669,658	3,593,157
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	60,406,232	59,342,943
(6) Changes due to plan amendments	0	(146,358)
(7) Changes due to revised assumptions or methods	0	0
(8) Expected UAAL after changes	60,406,232	59,196,585
(9) Actual UAAL at end of year	52,701,197	60,652,849
(10) Gain (loss): (8) - (9)	7,705,035	(1,456,264)
(11) Gain (loss) as a percent of actuarial accrued liabilities at start of year ($235,093,951)	3.3%	(0.6%)

Gain (loss) by Source	2024	2023
Actual vs. Expected Rate of Return on Assets	$1,719,131	$647,055
Demographic and Other Experience	5,985,904	(809,209)
	7,705,035	(1,456,264)

* *Unfunded Actuarial Accrued Liability.*

Derivation of Actuarial Gain (Loss)
Historical Statement

Valuation Date June 30	Actuarial Gain (Loss) as % of Beginning Accrued Liabilities
2015	0.6 %
2016	0.0 %
2017	(0.8)%
2018	(1.2)%
2019	0.7 %
2020	(2.3)%
2021	2.0 %
2022	(1.7)%
2023	(0.6)%
2024	3.3 %

Comments, Recommendations and Conclusions

Experience: Overall experience was favorable during the year leading to actuarial gains. Investment experience on a market value basis for the year ended June 30, 2024 was favorable with a market rate of return of 13.73%. On a funding value basis, the investment gain as of June 30, 2024 totaled $1,719,131 for a recognized rate of return of 7.25% (for comparison the assumed return on the funding value of assets was 6.25%). In addition, there were gains due to lower pay increases than expected and higher retiree mortality.

Assumption and Method Changes: There were no assumption or method changes for the June 30, 2024 valuation.

Benefit Changes: There were no benefit changes for the June 30, 2024 valuation.

Amortization Method: The Board adopted a layered amortization method beginning with the June 30, 2022 valuation. In particular:

- The Unfunded Actuarial Accrued Liability (UAAL) attributable to experience deviations and assumption changes were consolidated and amortized over a closed 25-year period beginning with the June 30, 2022 valuation.
- The existing UAAL bases attributable to benefit changes were accelerated to be amortized over closed 20-year periods, if applicable.
- Future changes to the UAAL attributable to benefit, assumption/method changes, and experience deviations will be amortized separately as they occur over the following periods:
    - Benefit changes – Closed 15-year periods
    - Assumption/method changes – Closed 20-year periods
    - Experience deviations – Closed 20-year periods

The respective layers are amortized as a level percent of payroll. Absent actuarial gains or losses, a closed amortization period is expected to result in UAAL amortization payments that remain level as a percentage of payroll.

Contribution Rate Reconciliation: The computed City contribution rate can be reconciled as follows:

Rate computed June 30, 2023	**38.28%**
Experience (Gain)/Loss	(3.16)%
Change in Normal Cost	0.02%
Payroll growth lower than assumed	2.38%
Rate computed June 30, 2024	**37.52%**

Expected Computed Contribution Rates in Future Years: The method used to derive valuation assets will, over the long term, produce rates of return equal to those measured on a pure market value basis. This means that over the long term, total employer contributions are not expected to be impacted by the method used to derive valuation assets. This relationship does not hold over the short term; valuation assets may drop to 80% of market value or go up to 120% of market value. Valuation assets are now approximately $4.7 million lower than the market value, with a $1.9 million investment gain to be recognized during the next year. Recognition of this gain is expected to put downward pressure on employer contribution rates (in the absence of significant investment losses).

Comments, Recommendations and Conclusions

Post-Retirement Health Care Benefit: Contributions made to the retiree health portion of the fund must meet certain requirements specified in IRC 401(h). These requirements were met for the plan year ending 2024. Page A-16 of this report provides more detail regarding the required subordination test.

As long as post-retirement health care payments made from the Retirement System do not exceed the Reserve for Health Care balance, the decision to either levy any money or make any contributions to cover post-retirement health care through the Retirement System remains a policy decision. For the June 30, 2024 valuation, the Reserve for Health Care balance was reported as $148,295 and is held as a liability for purposes of this report.

Experience Review: Public Act 202 of Michigan requires an actuarial experience study to be conducted every five years. An actuarial experience study reviews both demographic assumptions (rates of mortality, retirement, withdrawal, disability) and economic assumptions (investment return, wage inflation, price inflation, merit and seniority wage increases). The last experience study was completed September 20, 2022 and investigated the five-year period ending June 30, 2021. The next experience study will cover the five-year period ending June 30, 2026 and will be the basis for the assumptions used in the June 30, 2027 valuation.

Public Act 202: Public Act 202 (PA 202) was signed into law December 20, 2017 and requires local units of government to electronically submit Form 5572 to the Michigan Department of Treasury (DOT) on an annual basis to evaluate the funded status of the retirement pension system. The local unit of government is considered underfunded if the actuarial accrued liability of a retirement pension system is less than 60% funded, and if the annual required contribution for all of the retirement systems of the local unit of government is greater than 10% of annual general fund operating revenues. An underfunded local unit of government is required to develop and submit for approval a corrective action plan for the local unit of government.

The Michigan State Treasurer has established uniform actuarial assumptions as required by PA 202 for use with the annual Form 5572 (Retirement System Annual Report). The use of the uniform assumptions for reporting was required starting with fiscal year 2019.

We would be happy to discuss with the Board options for fulfilling the reporting requirements. Fees associated with these reporting requirements would be based on the complexity of the assignment.

Conclusion: The Retirement System's financial objective is to meet long-term benefit obligations through contributions that remain approximately level from year to year as a percent of active member payroll. Continued receipt of these contributions is the best guarantee that the Plan will be able to pay all promised benefits when due.

IRC 401(h) Compliance Test

Valuation Year	Fiscal Year	(1) Estimated Payroll	(2) PUCNC Pension	(3) Actual $ Pension	(4) Total Actual PUCNC	(5) Health Contribution	(6) Sum of (4)+(5)	(7) Sum of All Years in (5)	(8) Sum of All Years in (6)	(9) Percentage Health/Total (7)/(8)
6/17	16/17	$ 13,843,555	29.17%	$ 5,461,382	$ 4,038,054	$ 500,000	$ 4,538,054	$ 19,244,977	$ 97,791,948	19.7%
6/18	17/18	14,270,321	30.37%	6,156,346	4,334,088	500,000	4,834,088	19,744,977	102,626,036	19.2%
6/19	18/19	14,261,366	29.85%	6,534,126	4,257,187	484,052	4,741,239	20,229,029	107,367,275	18.8%
6/20	19/20	14,407,767	30.00%	7,022,072	4,321,831	428,009	4,749,840	20,657,038	112,117,115	18.4%
6/21	20/21	14,437,985	27.96%	7,615,441	4,037,505	331,308	4,368,813	20,988,346	116,485,928	18.0%
6/22	21/22	14,606,294	26.98%	7,788,736	3,941,307	304,595	4,245,902	21,292,941	120,731,830	18.0%
6/23	22/23	15,972,169	29.74%	7,974,006	4,750,732	271,367	5,022,099	21,564,308	125,753,929	17.1%
6/24	23/24	16,399,765	30.06%	8,105,513	4,930,151	-	4,930,151	21,564,308	130,684,080	16.5%

Other Observations

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

Given the System's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the Retirement System earning 6.25% on the Market Value of Assets), it is expected that:

1. The employer normal cost is sufficient to cover the cost of benefits accruing each year;
2. The Unfunded Actuarial Accrued Liabilities (UAAL) will continue to be amortized; and
3. The funded status of the Retirement System will continue to increase gradually towards a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the Actuarial Accrued Liability (AAL) and the Funding Value of Assets (FVA). Unless otherwise indicated, with regard to any funded status measurements presented in this report:

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

Limitations of Project Scope

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

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 – Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Risk Measures

($ in Thousands)

Actuarial Valuation Date (6/30)	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability (AAL)	(3) Unfunded AAL (UAAL) (2) - (1)	(4) Payroll	(5) Funded Ratio (1) / (2)	(6) Retiree Liabilities (RetLiab)	(7) RetLiab / AAL (6)/(2)	(8) AAL / Payroll (2) / (4)	(9) Assets / Payroll (1) / (4)	(10) UAAL / Payroll (3) / (4)	(11) Non-Invest. Cash Flow (NICF)	(12) NICF / Assets (11)/(1)	(13) Market Rate of Return	(14) 5-year Trailing Average
2020 *	$ 154,625	$ 204,208	$ 49,583	$ 14,617	75.7%	$ 125,300	61.4%	1,397.1%	1,057.8%	339.2%	$ (3,909)	(2.5)%	5.9%	6.1%
2021 *	165,872	210,849	44,977	14,259	78.7%	135,493	64.3%	1,478.7%	1,163.3%	315.4%	(4,305)	(2.6)%	23.1%	10.2%
2022 *	170,222	229,419	59,197	14,954	74.2%	144,873	63.1%	1,534.2%	1,138.3%	395.9%	(4,623)	(2.7)%	(12.8)%	5.4%
2023 *	174,441	235,094	60,653	16,991	74.2%	146,087	62.1%	1,383.6%	1,026.7%	357.0%	(5,598)	(3.2)%	10.6%	6.1%
2024	181,523	234,224	52,701	15,809	77.5%	151,244	64.6%	1,481.6%	1,148.2%	333.4%	(5,372)	(3.0)%	13.7%	7.4%

* *Revised actuarial assumptions or changes in benefit provisions.*

(5). The funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio 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 ratio 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). 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.

(11) and (12). 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 -2% to -3% based upon current plan assumptions. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(13) and (14). Investment return is probably the largest single risk that most systems face. The year-by-year return and the five-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 will differ modestly from figures reported by the investment consultant.

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 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 dollar amount. To fulfill this objective, the discount rate that is used to value the accrued liabilities is set equal to the **expected return** on the System's diversified portfolio of assets (referred to sometimes as the investment return assumption). The current investment return assumption is 6.25%.

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 projected unit credit actuarial cost method and discount rates based upon the June 2024 Treasury Yield Curve Spot Rates (monthly average). 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.

Accrued Liabilities and LDROM

Valuation Accrued Liabilities	LDROM
$234,224,203	$287,285,334

SECTION B

SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA

Brief Summary of Act 345 Benefit Conditions Evaluated (Updated to June 30, 2024)

ELIGIBILITY	AMOUNT

SERVICE RETIREMENT

The benefit amounts attributable to regular retirements and the conditions under which such benefits may be paid are described in tabular form on page B-2.

DEFERRED RETIREMENT

Termination of employment after 10 or more years of service.	Computed as service retirement but based upon service, Average Final Compensation (AFC) and benefit in effect at termination. Benefit begins at date retirement would have occurred had member remained in employment.

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, or a Police member with 10 or more years of service.	Accrued straight life pension actuarially reduced in accordance with an Option I election.

DUTY DEATH-IN-SERVICE SURVIVOR'S PENSION

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

NON-DUTY DISABILITY

Payable upon the total and permanent disability of a member with 5 or more years of service.	To age 55: 1.5% of AFC times years of service. At age 55: Same as Service Retirement Pension.

DUTY DISABILITY

Payable upon the total and permanent disability of a member in the line of duty.	To age 55: 50% of AFC. At age 55: Same as Service Retirement Pension with service credit from date of disability to age 55.

MEMBER CONTRIBUTIONS

Amounts are described on page B-2.

Summary of Benefit Provisions
as of June 30, 2024

Group	No. People	GRS Code	Eligibility	Benefit Multiplier*	Maximum Benefit	Years in FAC	Member Contribution Rate
Police:							
Sergeants - POLC	18	91	25 yrs. of service or age 60	3.0%/1.0%	80% of FAC	3	13.22%
Lieutenants	6	90	25 yrs. of service or age 60	3.0%/1.0%	80% of FAC	3	12.50%
POLC	84	92	25 yrs. of service or age 60	3.0%/1.0%	80% of FAC	5	10.75%
Non-Represented	1	95,97	25 yrs. of service or age 60	3.0%/1.0%	80% of FAC	3	10.00%
Fire:							
OSP	3	94	25 yrs. of service or age 60	3.0%/0.0%	75% of FAC	3	11.65%
IAFF	76	93	25 yrs. of service or age 60	3.0%/0.0%	75% of FAC	3	13.04%
Non-Represented	1	98	25 yrs. of service or age 60	3.0%/1.0%	80% of FAC	3	10.00%
Total	**189**						

* *First multiplier applies to the first 25 years of service. Second multiplier applies to service between 25 and 30 years of service.*

Note: None of the above groups are covered by Social Security.
Employee contributions are made on a pre-tax basis.

Summary of Benefit Provisions
as of June 30, 2024

DEFERRED RETIREMENT OPTION PLAN (DROP)

Effective April 2, 2015 for Firefighter OSP Chiefs and July 1, 2016 for Police Lieutenants, Firefighter IAFF, July 1, 2020 for Non-Represented Command Police Personnel, July 1, 2021 for Non-Represented Command Fire Personnel, and July 1, 2022 for Police Sergeants, members with credited service between 25 and 30 years may participate in the Deferred Retirement Option Plan for a maximum participation period of five years (two years for Non-Represented Command Personnel). For Police Sergeants, the DROP expired on June 30, 2024. The benefit amount is the participant's accrued benefit at the date of DROP election. DROP benefits are credited monthly and DROP interest is credited quarterly to a DROP account at the rate of 2% annually. Employer and employee contributions will continue while the member participates in the DROP. Employer and employee contributions are not deposited in the DROP account. Upon actual retirement, the participant may elect a lump sum distribution of the DROP account or direct rollover to a qualified plan.

Sample Benefit Computation

Assumed data in connection with this sample retirement is shown below:

	Data	Description
A.	$80,000	Final Average Compensation
B.	27	Years of Credited Service
C.	50	Age of Retiree
D.	60%	Percentage to continue to spouse after retiree's death (this is automatic)

	Sample Computation Steps		Annual Amount
E.	Benefit Formula:	0.03 x 25 x $80,000 =	$60,000
		+0.01 x 2 x $80,000 =	1,600
			61,600
F.	Maximum Benefit:	0.80 x $80,000 =	$64,000
	Benefit payable to:		
G.	Retiree while spouse is alive (lesser of E and F)		$61,600
H.	Spouse after retiree's death (D x G)		$39,960
I.	Retiree after spouse's death		$61,600

Statement of System Assets
as of June 30, 2024 and 2023

	2024	2023
Assets		
Cash and Short-Term Investments	$ 3,996,008	$ 5,240,910
Depository Receipts	177,082	242,236
Money Markets	0	0
Receivables		
Accrued Interest and Dividends	408,325	291,806
Investments		
Fixed Income	56,099,801	50,042,641
Equities	125,761,026	113,255,456
Real Estate	0	0
Other	0	0
	181,860,827	163,298,097
Accounts Payable	(202,528)	(274,417)
Net assets held in trust for pension benefits	$186,239,714	$168,798,632

Statement of Changes in System Assets
for the Fiscal Years Ended June 30, 2024 and June 30, 2023

	June 30, 2024 @	June 30, 2023 @
Additions		
Contributions		
Employer	$ 6,140,034	$ 6,051,642
Plan members	1,965,479	1,922,364
Total contributions	8,105,513	7,974,006
Investment Income*	22,813,005	16,469,933
Total additions	30,918,518	24,443,939
Deductions		
Benefits	13,229,517	13,537,067
Refunds of contributions#	45,391	35,191
Net Health insurance premiums	202,528	0
Total deductions	13,477,436	13,572,258
Net Increase	17,441,082	10,871,681
Net assets held in trust for pension benefits		
Beginning of year	168,798,632	157,926,951
End of year	$186,239,714	$168,798,632

@ Net of health reserve.
** Net of investment and administrative expenses.*
 # May be negative due to redeposits.

Allocation of Employer Assets between Pension and Health

	Pension	Health	Total
1) Market Value of Assets June 30, 2023	**$168,447,809**	**$ 350,823**	**$168,798,632**
2) Employer Contrib. ($) FY 23/24	6,140,034	0	6,140,034
3) Employee Contrib. ($) FY 23/24	1,965,479	0	1,965,479
4) Benefits Paid and Refunds FY 23/24	13,274,908	202,528	13,477,436
5) Net Cash Flow FY 23/24: (2)+(3)-(4)	(5,169,395)	(202,528)	(5,371,923)
6) Investment Income FY 23/24 (Market Value)	22,813,005	0	22,813,005
7) Market Value of Assets June 30, 2024 (1)+(2)+(3)-(4)+(6)	**$186,091,419**	**$ 148,295**	**$186,239,714**

Reported Fund Balance

Reserves for	Reported Market Values June 30	
	2024	2023
Employees' Contributions	$ 43,787,081	$ 43,166,494
Employer Contributions	(117,161,760)	(123,809,783)
Retired Benefit Payments	259,466,098	249,441,921
Post-Retirement Health Care	148,295	0
Total Fund Balance	$186,239,714	$168,798,632

Valuation assets are equal to the funding value of assets derived on page A-9.

In financing actuarial accrued liabilities, valuation assets of $181,523,006 were distributed as follows:

Reserves for	Valuation Assets Applied to Actuarial Accrued Liabilities for			Totals
	Active Members	Retirees and Beneficiaries	Health Care Reserve	
Employees' Contributions	$ 43,787,081			$ 43,787,081
Employer Contributions	(8,939,327)	$ (108,222,433)		(117,161,760)
Retired Benefit Payments		259,466,098		259,466,098
Health Care			$148,295	148,295
Market Value Adjustment	(4,716,708)			(4,716,708)
Total Funding Value	$ 30,131,046	$151,243,665	$148,295	$181,523,006

Summary of Current Asset Information Reported for Valuation

Assets (Market Value)

	June 30	
	2024	2023
Cash & equivalents	$ 3,996,008	$ 5,240,910
Other short-term investments	408,325	291,806
Fixed income	56,099,801	50,042,641
Stocks	125,761,026	113,255,456
Real estate investments	0	0
Accounts receivable	177,082	242,236
Accounts payable	(202,528)	(274,417)
Total Assets	$186,239,714	$168,798,632

Revenues and Expenses

	2023-24	2022-23
Balance - July 1	$168,798,632	$157,926,951
Revenues		
Employees' contributions	1,965,479	1,922,364
Employer contributions-pension	6,140,034	6,051,642
Employer contributions-401(h)	0	271,367
Net Investment income	23,030,283	16,666,426
Expenses		
Benefit payments	13,229,517	13,537,067
Refunds of member contributions	45,391	35,191
Administrative expenses	217,278	196,493
Health insurance premiums	202,528	271,367
Rounding Adjustment	0	0
Balance - June 30	$186,239,714	$168,798,632

Asset Information Reported for Valuation
Comparative Statement

Year Ended June 30	Assets Beginning of Year	Revenues				Expenses			Assets Year-End
		Employee Contrib.	Employer Contrib.	Investment Income	Misc. Income	Retirement Benefits	Contribs. Refunds	Misc.(*) Expenses	
2000	$ 98,904,840	$ 860,852	$2,005,241	$ 10,074,744	$ 0	$ 4,206,891	$ 112,149	$1,327,756	$ 106,198,881
2001	106,198,881	946,812	1,590,027	(508,876)	0	4,411,998	168,781	1,691,962	101,954,103
2002	101,954,103	924,388	1,748,678	(5,364,998)	0	4,556,200	34,664	1,734,654	92,936,653
2003	92,936,653	964,525	1,571,015	3,196,673	0	4,785,350	46,812	1,991,658	91,845,046
2004	91,845,046	999,306	2,720,559	8,470,556	0	4,990,364	141,260	2,320,746	96,583,097
2005	96,583,097	1,001,337	2,922,144	4,944,462	0	5,473,699	41,859	2,129,549	97,805,933
2006	97,805,933	960,556	3,108,229	8,955,746	0	6,166,401	105,665	2,375,321	102,183,077
2007	102,183,077	943,869	3,540,775	13,563,262	0	5,976,094	111,456	1,733,295	112,410,138
2008	112,410,138	1,057,662	3,617,333	(1,099,790)	0	6,035,431	130,761	792,349	109,026,802
2009	109,026,802	1,076,661	3,908,721	(12,529,495)	0	6,849,499	74,325	1,147,058	93,411,807
2010	93,411,807	1,010,170	3,622,270	11,782,723	0	7,290,810	107,078	1,277,732	101,151,350
2011	101,151,350	1,030,979	4,346,195	17,754,126	0	7,581,972	13,464	1,168,496	115,518,718
2012	115,518,718	922,117	4,159,617	2,600,092	0	8,669,455	110,630	1,123,098	113,297,361
2013	113,297,361	1,044,533	4,105,429	11,514,896	0	7,735,131	75,382	1,124,722	121,026,984
2014	121,026,984	984,463	4,316,203	17,738,393	0	8,899,974	47,356	1,180,048	133,938,665
2015	133,938,665	1,166,241	4,612,446	5,204,344	0	9,358,827	22,952	1,689,483	133,850,434
2016	133,850,434	1,077,633	4,664,957	2,617,276	0	9,441,511	3,067	716,729	132,048,993
2017	132,048,993	1,233,148	4,728,234	11,564,650	0	10,355,887	20,019	689,782	138,509,337
2018	138,509,337	1,475,859	5,180,487	10,142,548	0	9,946,758	68,887	704,123	144,588,463
2019	144,588,463	1,473,592	5,544,586	9,768,966	0	10,436,876	164,866	664,171	150,109,694
2020	150,109,694	1,580,109	5,869,972	8,986,886	0	10,858,751	72,458	657,280	154,958,172
2021	154,958,172	1,593,679	6,353,070	35,586,493	12,106	11,949,168	(29,331)	563,837	186,019,846
2022	186,019,846	1,725,254	6,368,077	(23,276,182)	17,184	12,299,677	109,594	517,957	157,926,951
2023	157,926,951	1,922,364	6,323,009	16,666,426	0	13,537,067	35,191	467,860	168,798,632
2024	168,798,632	1,965,479	6,140,034	22,913,764	116,519	13,229,517	45,391	419,806	186,239,714

(*) Misc. expenses include administrative expenses and health insurance premiums for retired lives paid after 8/1/1980. Contribution of refunds may be negative due to redeposits.

Retirees and Beneficiaries Added to and Removed from Rolls
Comparative Statement

Year Ended June 30	Added to Rolls (Includes Benefit Adjustments)		Removed from Rolls		Rolls End of Year		% Incr. Annual Benefits	Average Annual Benefit	Present Value of Benefits	Expected Removals
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits				
1995#	11	$ 313,427	2	$ 15,728	135	$ 2,465,826	13.7 %	$18,265	$ 26,363,115	3.9
1996@	9	452,213			144	2,918,042	18.3 %	20,264	31,375,781	4.3
1997	15	564,090	5	42,709	154	3,439,423	17.9 %	22,334	37,399,338	4.6
1998	11	370,753	1	11,172	164	3,799,004	10.5 %	23,165	41,008,304	5.1
1999	15	459,424	8	114,372	171	4,144,056	9.1 %	24,234	45,233,238	5.2
2000	12	274,422	7	129,923	176	4,288,555	3.5 %	24,367	46,324,310	5.6
2001	16	424,378	8	134,929	184	4,578,004	6.7 %	24,880	49,610,467	5.6
2002	6	123,085	3	41,718	187	4,659,371	1.8 %	24,916	51,343,164	5.1
2003	9	352,598	3	41,567	193	4,970,403	6.7 %	25,753	54,767,310	5.3
2004	5	197,292	5	55,272	193	5,112,423	2.9 %	26,489	56,062,967	5.3
2005	12	558,890	3	39,781	202	5,631,532	10.2 %	27,879	62,017,507	5.3
2006	4	168,387	2	15,692	204	5,784,227	2.7 %	28,354	62,976,517	5.7
2007#@	8	641,673	4	70,472	208	6,355,428	9.9 %	30,555	67,946,355	6.0
2008#	9	395,393	6	96,022	211	6,654,800	4.7 %	31,539	71,090,277	6.5
2009#	17	747,839	5	95,118	223	7,307,521	9.8 %	32,769	79,883,240	6.5
2010	11	283,961	8	145,046	226	7,446,436	1.9 %	32,949	80,725,431	5.9
2011	12	508,150	5	75,940	233	7,878,646	5.8 %	33,814	85,197,066	6.1
2012	13	647,101	7	148,315	239	8,377,432	6.3 %	35,052	91,012,108	6.4
2013	14	651,987	5	99,636	248	8,929,783	6.6 %	36,007	96,565,549	6.2
2014	6	319,868	3	79,524	251	9,170,127	2.7 %	36,534	98,326,146	6.7
2015#	9	418,887	8	148,950	252	9,440,064	2.9 %	37,461	107,510,592	7.0
2016#	9	241,162	11	235,038	250	9,446,188	0.1 %	37,785	106,715,647	5.5
2017#	8	355,784	10	270,124	248	9,531,848	0.9 %	38,435	110,428,262	5.4
2018#	18	909,453	10	225,743	256	10,215,558	7.2 %	39,905	118,343,985	5.5
2019#	12	487,882	5	138,202	263	10,565,238	3.4 %	40,172	120,707,301	5.6
2020#	8	526,794	8	134,226	263	10,957,806	3.7 %	41,665	125,300,489	6.8
2021#	15	1,013,222	8	185,694	270	11,785,334	7.6 %	43,649	135,492,647	6.8
2022#	8	558,056	3	65,950	275	12,277,440	4.2 %	44,645	144,872,870	6.8
2023#	20	587,327	13	421,119	282	12,443,648	1.4 %	44,126	146,086,534	6.5
2024	13	689,215	8	260,666	287	12,872,197	3.4 %	44,851	151,243,665	6.5

 # After plan amendment and/or changes to actuarial assumptions.
@ Includes correction to data in between valuations (removal of two retirees who had died).

Retirees and Beneficiaries by Type of Benefits Being Paid

Type of Benefit Being Paid	No.#	Annual Benefits Being Paid	Average Annual Benefit
Age and Service Benefits			
Straight life benefit - benefit terminating at death of retiree	53	$ 1,964,797	$37,072
Automatic 60% survivor benefit to spouse	190	9,923,845	52,231
Option 1 benefit - 100% joint and survivor	1	14,285	14,285
Benefit being paid survivor beneficiary of deceased retiree	31	597,200	19,265
Total age and service benefits	275	12,500,127	45,455
Casualty Benefits			
Duty disability benefits	5	173,138	34,628
Non-duty disability benefits	4	118,865	29,716
Duty death benefits	1	34,546	34,546
Non-duty death benefits	2	45,521	22,761
Total casualty benefits	12	372,070	31,006
Total Benefits Being Paid	**287**	**$12,872,197**	**$44,851**

 # Includes Alternate Payees that are receiving benefits as a result of an EDRO/DRO.

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

Attained Ages	Age & Service Retirees		Disability Retirees		Survivor Beneficiaries	
	No.#	Annual Benefits	No.	Annual Benefits	No.#	Annual Benefits
35 - 39						
40 - 44			1	$ 28,773		
45 - 49	6	$ 436,861	2	70,495	1	$ 40,137
50 - 54	25	1,489,556	1	12,348		
55 - 59	30	1,771,003	1	37,602		
60 - 64	40	2,280,021	2	68,915	2	64,655
65 - 69	35	1,742,009			3	76,161
70 - 74	48	1,920,173	2	73,870	1	18,600
75 - 79	44	1,756,287			10	219,861
80 - 84	12	382,409			7	130,940
85 - 89	4	124,608			4	72,429
90 - 94					5	45,844
95 - 99						
100					1	8,640
Totals	**244**	**$11,902,927**	**9**	**$292,003**	**34**	**$677,267**

 # Includes Alternate Payees that are receiving benefits as a result of an EDRO/DRO.

Active Members in the DROP as of June 30, 2024

Valuation Divisions	No.	Annual Retirement Benefits	DROP Account Balances	Annual Payroll	Average Age	
					At DROP	Current
Police:						
Lieutenants	2	$ 179,606	$ 665,301	$ 266,034	50.8	54.4
Sergeants (POLC)	1	128,214	245,048	130,280	59.8	61.7
Other POLC	0	0	0	0	0.0	0.0
Non-Represented	0	0	0	0	0.0	0.0
Fire:				0		
OSP	1	109,979	182,116	126,766	49.1	50.7
IAFF	9	710,395	1,382,899	954,761	53.4	55.4
Non-Represented	0	0	0	0	0.0	0.0
Total	**13**	**$1,128,194**	**$2,475,364**	**$1,477,841**	**53.2 yrs.**	**55.4 yrs.**

Active Members as of June 30, 2024
Tabulated by Valuation Divisions

Valuation Division	No.	Annual Payroll	Average in Years		Average Pay
			Age	Service	
Police:					
Lieutenants	6	$ 770,467	47.6	23.5	$128,411
Sergeants (POLC)	18	1,948,518	44.6	6.6	108,251
Other POLC	84	6,046,898	34.5	7.7	71,987
Non-Represented	1	130,457	55.3	2.8	130,457
Fire:					
OSP	3	430,470	48.1	23.4	143,490
IAFF	76	6,358,922	41.0	11.3	83,670
Non-Represented	1	123,048	55.6	1.7	123,048
Totals*	**189**	**$15,808,780**	**39.0**	**9.8**	**$ 83,644**

* *Includes 13 DROP members with payroll of $1,477,841.*

Additions to and Removals from Active Membership
Actual and Expected Numbers
10-Year Historical Schedule

Year Ended June 30	Number Added		Normal Retirement		Disability Retirement		Died-in-Service		Terminations		Members End of Year
	A	E	A	E	A	E	A	E	A	E	
2015	13	8	4	2.7	1	0.5	0	0.1	3	3.3	188
2016	5	5	2	2.8	1	0.4	0	0.1	2	3.3	188
2017	9	8	4	4.0	0	0.4	0	0.1	4	3.2	189
2018	13	17	11	5.3	3	0.4	0	0.1	3	3.1	185
2019	10	13	6	2.2	1	0.4	0	0.1	6	3.3	182
2020	6	11	8	3.1	0	0.4	0	0.1	3	3.2	177
2021	16	20	13	9.5	0	0.3	0	0.1	7	2.9	173
2022	19	18	7	4.6	0	0.3	0	0.1	11	3.1	174
2023	31	11	5	1.5	0	0.4	0	0.1	6	3.8	194
2024	14	19	8	4.2	0	0.4	0	0.1	11	4.5	189
10-Year Totals	136	130	68	39.9	6	3.9	0	1.0	56	33.7	

A Represents actual number.
E Represents expected number based on assumptions outlined in Section C.

Final Average Compensation for New Retirees With and Without Lump Sums (Comparative Schedule)

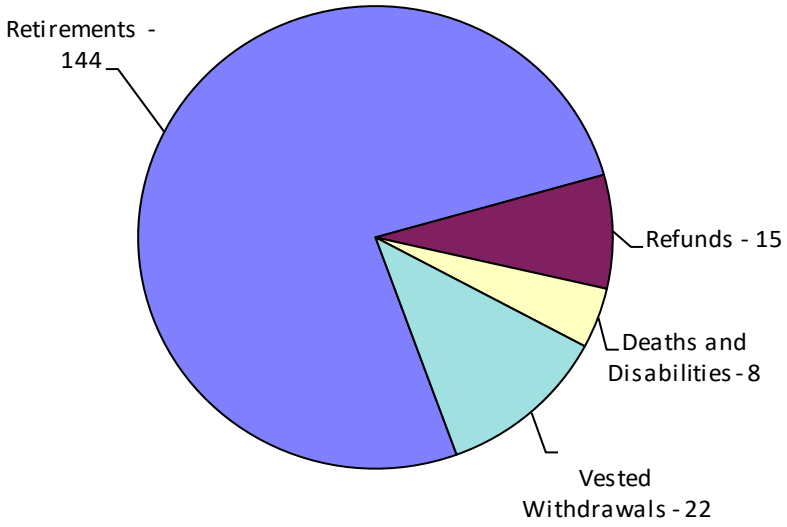
Year Ending June 30	Final Average Compensation		
	With	Without	Ratio
2015	$ 498,461	$ 466,597	1.07
2016	224,046	206,720	1.08
2017	434,145	414,065	1.05
2018	971,268	930,353	1.04
2019	643,352	621,496	1.04
2020	702,212	669,432	1.05
2021	1,272,491	1,225,473	1.04
2022	1,136,969	1,087,216	1.05
2023	439,112	426,818	1.03
2024	1,152,854	1,117,863	1.03
10-Year Average	$ 747,491	$ 716,603	1.04

Active Members Included in Valuation
Comparative Statement

Valuation Date June 30	Active Members	Vested Term. Members	Reported Payroll*	Average Age	Average Service	Average Pay	% Increase
1990	208	5	$ 7,727,204	38.7	12.4	$37,150	5.9 %
1991	212	6	7,770,366	39.2	13.0	36,653	(1.3)%
1992	217	6	8,359,429	39.7	13.4	38,523	5.1 %
1993	221	6	8,562,961	40.0	13.8	38,746	0.6 %
1994	206	6	8,357,447	39.8	13.5	40,570	4.7 %
1995	213	6	9,103,643	39.3	12.8	42,740	5.3 %
1996	229	6	9,834,167	38.6	11.6	42,944	0.5 %
1997	225	7	10,039,322	38.2	11.0	44,619	3.9 %
1998	216	6	9,813,441	38.3	11.2	45,433	1.8 %
1999	218	7	9,749,682	38.0	10.7	44,723	(1.6)%
2000	220	6	11,235,312	38.3	10.8	51,070	14.2 %
2001	215	7	11,615,098	38.2	10.8	54,024	5.8 %
2002	218	5	11,907,553	38.7	11.3	54,622	1.1 %
2003	207	5	11,885,130	39.3	12.0	57,416	5.1 %
2004	209	5	12,114,360	39.6	12.3	57,963	1.0 %
2005	199	5	12,085,192	39.9	12.5	60,730	4.8 %
2006	201	5	12,283,787	40.3	13.0	61,113	0.6 %
2007	201	5	12,358,265	40.7	13.3	61,484	0.6 %
2008	197	4	12,497,433	40.8	13.5	63,439	3.2 %
2009	188	5	11,953,735	40.3	13.0	63,584	0.2 %
2010	190	5	12,383,339	40.6	13.2	65,175	2.5 %
2011	193	5	12,609,794	40.7	13.0	65,336	0.2 %
2012	184	6	12,269,834	41.0	13.0	66,684	2.1 %
2013	177	9	11,700,630	40.2	12.6	66,105	(0.9)%
2014	183	11	12,656,141	40.2	12.3	69,159	4.6 %
2015	188	9	13,495,955	40.3	12.3	71,787	3.8 %
2016	188	9	13,470,636	41.0	12.9	71,652	(0.2)%
2017	189	9	14,216,474	41.4	13.2	75,219	5.0 %
2018	185	8	14,324,168	40.7	12.7	77,428	2.9 %
2019	182	9	14,198,563	40.9	12.7	78,014	0.8 %
2020	177	8	14,616,971	41.3	13.0	82,582	5.9 %
2021	173	10	14,258,999	40.0	12.1	82,422	(0.2)%
2022	174	10	14,953,589	39.7	11.7	85,940	4.3 %
2023	194	10	16,990,750	38.9	9.8	87,581	1.9 %
2024	189	10	15,808,780	39.0	9.8	83,644	(4.5)%

* *Reported payroll. Beginning in 1980, payroll was projected by a factor of 1.07 to approximate the relationship between gross payroll and the reported base payroll. Beginning in 1987, gross payroll was reported and no projection was necessary.*

Active Members as of June 30, 2024
Expected Terminations by Type in Future Years



This chart above shows the expected future development of the present population in simplified terms. The Retirement System presently covers 189 active members. 88% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 4% of the present population is expected to die or become disabled and receive a benefit. 8% of the present population is expected to terminate employment and forfeit eligibility for an employer provided benefit.

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

Attained 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
15-19									
20-24	12							12	$737,499
25-29	23	4						27	1,764,091
30-34	14	6	5					25	1,776,802
35-39	7	15	12	3				37	2,963,298
40-44	4	7	6	13	3			33	2,886,332
45-49		2	3	6	10	1		22	2,287,317
50-54		1	5	2	5	5		18	1,797,190
55-59	2	2		1	1	6		12	1,245,645
60			1					1	121,839
62						2		2	228,767
Totals	**62**	**37**	**32**	**25**	**19**	**14**		**189**	**$15,808,780**

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

Age:	39.0 years
Service:	9.8 years
Annual Pay:	$83,644

SECTION C

FINANCIAL PRINCIPLES, ACTUARIAL VALUATION PROCESS, ACTUARIAL COST METHODS, ACTUARIAL ASSUMPTIONS AND DEFINITIONS OF TECHNICAL TERMS

Basic Financial Principles and Operation of the Retirement System

Benefit Promises Made Which Must Be Paid For. A retirement program is an orderly means of handing out, keeping track of, and financing pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit the member is, in effect, handed an "IOU" which reads: "The 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."

This Retirement System meets this requirement by having as its financial objective the establishment and receipt of 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 present value of future benefits assigned to 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).

The accumulation of invested assets is a by-product of level percent-of-payroll contributions, not the objective. Investment income becomes the third major contributor to the retirement program, and the amount is directly reacted to the amount of contributions and investment performance.

If contributions to the retirement program are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate:

B = C + I - E

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

The aggregate amount of Contributions received on behalf of the group

. . . plus . . .

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

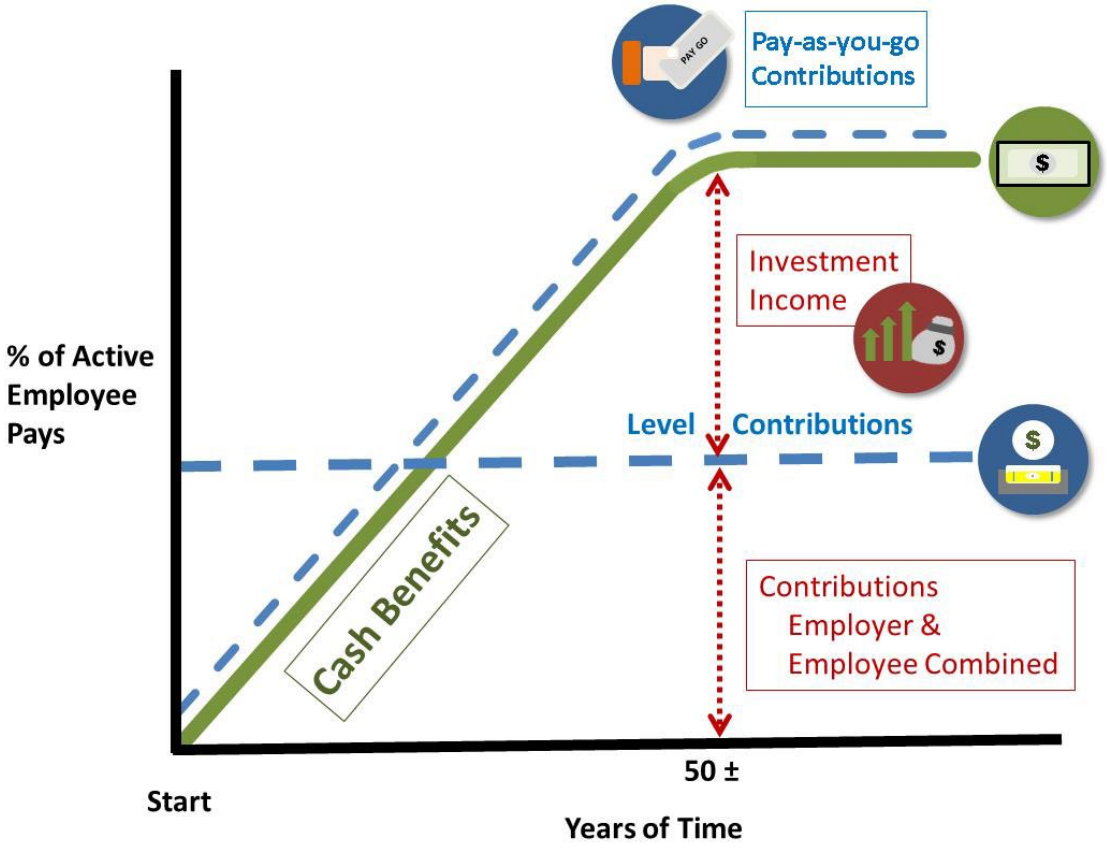
. . . minus . . .

The Expenses of operating the program.

There are retirement programs designed to defer the bulk of contributions far into the future. The present contribution rate for such systems is ***artificially low***. The fact that the contribution rate is destined to increase relentlessly to a much higher level is often 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 program.



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

Actuarial Valuation Process

The financing diagram on the previous page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is an ***increasing contribution method***; and the ***level contribution method*** which equalizes contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. ***Covered Person Data***, furnished by plan administrator
   Retired lives now receiving benefits
   Former employees with vested benefits not yet payable
   Active employees

B. \+ ***Asset data*** (cash & investments), furnished by plan administrator

C. \+ ***Assumptions concerning future financial experience in various risk areas,*** which assumptions are established by the Retirement System after consulting with the actuary

D. \+ ***The funding method*** for the employer contributions (the long-term, planned pattern for employer contributions)

E. \+ ***Mathematically combining the assumptions, the funding method, and the data***

F. = Determination of:
   Plan financial position
   and/or New Employer Contribution Rate

Actuarial Cost Methods Used for the Valuation

Age and Service Benefits. 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:

(i) The annual normal costs for each individual active member (usually expressed as a percent-of-payroll), payable from the member's date of hire to the member's projected date of retirement, are sufficient to accumulate the actuarial present value of the member's projected benefit at the time of retirement; and

(ii) The actuarial accrued liability under this method is equal to the assets which would have been accumulated had the normal cost contribution been made from the date of entry to the date of the valuation and had all actuarial assumptions been realized.

Casualty Benefits. Normal cost contributions were determined using a one-year term cost method. This method produces contributions sufficient to fund the value of (i) disability benefits likely to be incurred during the year (net of the member's accrued age and service benefits), and (ii) survivor benefits likely to be incurred during the year because of a member's death while employed.

Funding Value of Assets. The funding value of assets is derived as follows: prior year valuation assets are increased by contributions and expected investment income and reduced by refunds and benefit payments. To this amount is added 20% of the difference between expected and actual investment income for each of the previous five years. Funding value of assets may not be less than 80% nor more than 120% of market value.

Amortization of Unfunded Actuarial Accrued Liabilities. Beginning with the June 30, 2022 valuation, the unfunded actuarial accrued liabilities are amortized as level percent of payroll contributions (principal and interest combined) over the following periods:

- Initial Period
  - UAAL attributable to experience deviations and assumption changes as of June 30, 2022 is over a closed 25-year amortization period.
- Benefit changes
  - Bases before June 30, 2022 – Accelerated to closed 20-year amortization periods, if applicable.
  - Future bases – Closed 15-year amortization periods.
- Assumption/method changes
  - Future bases – Closed 20-year amortization periods.
- Changes from experience deviations
  - Future bases – Closed 20-year amortization periods.

Active member payroll was assumed to increase 3.50% per year for the purpose of determining the level percent contributions.

Actuarial Assumptions in the Valuation Process

Contribution requirements and actuarial present values for a retirement system are computed by applying actuarial assumptions to the benefit provisions and member data of the system, using the actuarial cost methods described on page C-5.

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

(i) Long-term rates of investment return to be generated by the assets of the system.
(ii) Patterns of pay increases to members.
(iii) Rates of mortality among members, retirees and beneficiaries.
(iv) Rates of withdrawal of active members.
(v) Rates of disability among active members.
(vi) The age patterns of actual retirements.

In making a valuation, the monetary effect of each assumption is computed for as long as a present covered person survives – a period of time which can be as long as a century.

The employer contribution rate has been computed to remain level from year to year so long as benefits and the basic experience and make-up of members do not change. Examples of favorable experience which would tend to reduce the employer contribution rate are:

(1) Investment returns in excess of 6.25% per year.

(2) Member non-vested terminations at a higher rate than outlined on page C-10.

(3) Mortality among retirees and beneficiaries at a higher rate than indicated by the PubS-2010 Standard Mortality Tables with fully generational mortality improvements using scale MP-2021.

(4) Increases in the number of active members.

Examples of unfavorable experience which would tend to increase the employer contribution rate are:

(1) Pay increases in excess of the rates outlined on page C-7.
(2) An increase in the rate of retirement over the rates outlined on page C-11.
(3) A pattern of hiring employees at older ages than in the past.

Actual experience of the System will not coincide exactly with assumed experience, regardless of the choice of the assumptions, the skill of the actuary and the precision of the calculations. 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 one or more of the assumptions is modified to reflect experience trends (but not random or temporary year-to-year fluctuations).

Actuarial Assumptions Used for the Valuation

Investment Return (net of investment and administrative expenses). 6.25% per year, compounded annually. This rate consists of a real rate of return of 2.75% a year plus a long-term rate of wage growth of 3.50% a year. There is no specific assumption about price inflation needed for this valuation. The assumptions made would be consistent with a price inflation assumption of 2.75%.

This assumption is used to equate the value of payments due at different points in time and was first used for the June 30, 2022 valuation. Approximate rates of investment return, for the purpose of comparisons with assumed rates, are shown below:

	Year Ended June 30				
	2024	**2023**	**2022**	**2021**	**2020**
Rate of Investment Return	7.3 %	5.9 %	5.5 %	10.2 %	6.0 %

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

These rates of return should not be used for measurement of an investment advisor's performance or for comparisons with other systems -- ***to do so will mislead***.

Pay Projections. These assumptions are used to project current pays to those upon which benefits will be based. The assumptions were first used for the June 30, 2022 valuation.

Sample Years of Service at Beginning of the Year	**Annual Rate of Pay Increase for Sample Years of Service**		
	Base (Economic)	**Merit & Longevity**	**Total**
0	3.50%	12.25%	15.75%
1	3.50%	9.25%	12.75%
2	3.50%	4.55%	8.05%
3	3.50%	3.75%	7.25%
4	3.50%	2.55%	6.05%
5	3.50%	2.25%	5.75%
6	3.50%	1.25%	4.75%
7	3.50%	1.25%	4.75%
8	3.50%	1.25%	4.75%
9 and over	3.50%	0.75%	4.25%
Ref.		299	

Actuarial Assumptions Used for the Valuation (Continued)

If the number of active members remains constant, the total active member payroll and the average pay will increase 3.50% annually, the base portion of the individual pay increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

Changes actually experienced in average pay and total payroll have been as follows:

	Year Ended June 30					3-Year Average	5-Year Average
	2024	2023	2022	2021	2020		
Average Pay	(4.5)%	1.9 %	4.3 %	(0.2)%	5.9 %	0.5 %	1.4 %
Total Payroll	(7.0)%	13.6 %	4.9 %	(2.4)%	2.9 %	3.5 %	2.2 %

Post-Retirement Mortality Table. The PubS-2010 Healthy Retiree Mortality Tables for males and females with 2-dimensional, fully generational improvements projected with the MP-2021 Mortality Improvement Scales. These rates were first used for the June 30, 2022 valuation. Sample values follow:

Sample Attained Ages	Single Life Retirement Values			
	Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$168.72	$171.72	35.65	37.69
55	159.48	163.20	30.60	32.58
60	147.84	152.64	25.70	27.66
65	134.04	140.16	21.09	23.00
70	117.84	125.04	16.79	18.60
75	99.48	107.52	12.87	14.52
80	79.80	88.44	9.43	10.89
Ref:	2703 x 1.00	2704 x 1.00		

Applicable to calendar year 2024. Values for future years are determined using the MP-2021 projection scale.

Actuarial Assumptions Used for the Valuation (Continued)

Disabled Mortality Table. The PubS-2010 Disabled Retiree Mortality Table for males and females with 2-dimensional, fully generational improvements projected with the MP-2021 Mortality Improvement Scales. These rates were first used for the June 30, 2022 valuation. Sample values follow:

Sample Attained Ages	Single Life Retirement Values			
	Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$164.88	$168.12	34.26	36.44
55	155.52	159.48	29.40	31.55
60	144.00	149.52	24.71	26.91
65	130.56	137.76	20.33	22.54
70	115.08	123.84	16.28	18.40
75	97.32	107.28	12.55	14.48
80	78.84	88.44	9.31	10.89
Ref:	2709 x 1.00	2710 x 1.00		

Applicable to calendar year 2024. Values for future years are determined using the MP-2021 projection scale.

Pre-Retirement Mortality Table. The PubS-2010 Employee Retiree Mortality Tables for males and females with 2-dimensional, fully generational improvements projected with the MP-2021 Mortality Improvement Scales. These rates were first used for the June 30, 2022 valuation. Sample values follow:

Sample Attained Ages	Single Life Retirement Values			
	Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$174.72	$178.20	38.58	41.01
55	167.04	171.72	33.50	35.91
60	157.20	163.08	28.50	30.87
65	144.60	151.68	23.62	25.88
70	128.76	136.68	18.90	20.96
75	109.32	117.84	14.42	16.22
80	85.92	94.80	10.23	11.75
Ref:	2721 x 1.00	2722 x 1.00		

Applicable to calendar year 2024. Values for future years are determined using the MP-2021 projection scale.

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement.

Actuarial Assumptions Used for the Valuation (Continued)

Rates of separation from active membership. The rates do not apply to members eligible to retire and do not include separation on account of death or disability. This assumption measures the probabilities of members separating from employment. Fire rates were first used for the June 30, 2002 valuation and last reviewed for the June 30, 2022 valuation. Police rates were first used for the June 30, 2022 valuation.

Sample Ages	% of Active Members Separating within Next Year	
	Police	Fire
30	4.60%	2.90%
35	3.95%	1.50%
40	2.35%	0.60%
45	1.75%	0.50%
50	1.75%	0.50%
55	0.50%	0.50%
60	0.50%	0.50%
Ref.	235 x 1	54 x 1

Rates of Disability. These assumptions represent the probabilities of active members becoming disabled. These rates were first used for the June 30, 2022 valuation.

Sample Ages	% of Active Members Becoming Disabled within Next Year	
	Men	Women
20	0.08%	0.10%
25	0.08%	0.10%
30	0.08%	0.10%
35	0.08%	0.10%
40	0.20%	0.36%
45	0.27%	0.41%
50	0.49%	0.57%
55	0.89%	0.77%
60	1.41%	1.02%
Ref.	9	10

Actuarial Assumptions Used for the Valuation (Concluded)

Rates of Retirement. These rates are used to measure the probabilities of an eligible member retiring during the next year.

Percent of Active Members Retiring within Next Year	
Retirement Ages	**All Groups**
60	30%
61	30%
62	30%
63	30%
64	30%
65	100%

Percent of Active Members Retiring within Next Year			
Years of Service	**Not Eligible for DROP**	**Eligible for 5-Year DROP**	**Eligible for 2-Year DROP**
25	75%	30%	30%
26	75%	15%	15%
27	75%	15%	30%
28	75%	15%	15%
29	75%	15%	15%
30 & Over	100%	100%	100%

These rates were first used for the June 30, 2022 valuation.

Active Member Group Size. The number of active members was assumed to remain constant. This assumption is unchanged from previous valuations.

Pensions in an Inflationary Environment

Value of $1,000/month Retirement Benefit to an Individual Who Retires at Age 55 in an Environment of 2.75% Price Inflation

Age	COLA Rate	
	2.5%	0%
55	$1,000	$1,000
56	998	973
57	995	947
58	993	922
59	990	897
60	988	873
65	976	762
70	964	666
75	952	581
80	941	508
85	930	443

The life expectancy of a 55-year-old male is to age 86. The life expectancy for a 55-year-old female is to age 88. Half of the people will outlive their life expectancy. The effects of even moderate amounts of inflation can be significant for those who live to an advanced age.

Miscellaneous and Technical Assumptions
June 30, 2024

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses. 90% of retirees are assumed to have a spouse eligible for the 60% death after retirement survivor benefit.
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:	All decrements are assumed to occur at the middle of the year.
Eligibility Testing:	Eligibility for benefits is determined using the age nearest birthday and the service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and mortality decrements do not operate during the first five years of service. Disability also does not operate during retirement eligibility.
Normal Form of Benefit:	The assumed normal form of benefit is the 60% joint and survivor form.
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.
Approximation:	Age and service benefits were increased by the following percentages to account for lump sums included in final average pay at retirement: Police Officers: 5%. Police Lieutenants: 8%. Police Sergeants, Fire OSP and IAFF: 8.33%.
Data Adjustments:	Prior-year pay was used for active members with large decreases in reported pay due to military leave or workers' compensation leave. It was noted for a member reported with both an active and a deferred record that future service would not accrue towards the current deferred retirement benefit. Therefore, only the member's deferred record was considered for purposes of this valuation.

Summary of Actuarial Methods and Assumptions

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

Valuation date	June 30, 2024
Actuarial cost method	Entry-age actuarial cost method
Amortization method	Layered, Level percent-of-payroll
Amortization periods	15-year closed for benefit improvements 20-year closed for assumption and method changes 20-year closed for experience deviations 25-year closed for liabilities as of June 30, 2022
Asset valuation method	5-year smoothed market with 20% corridor
Actuarial assumptions:	
Investment rate of return	6.25%
Projected salary increases	3.50% – 15.75%
Assumed rate of payroll growth	3.50%
Assumed rate of membership growth	0%
Cost-of-living adjustments	N/A

Definitions of Technical Terms

***Accrued Service*.** Service credited under the system which was rendered before the date of the actuarial valuation.

***Actuarial Accrued Liability*.** The difference between the actuarial present value of system benefits and the actuarial present value of future normal costs. Also referred to as "past service liability."

***Actuarial Assumptions*.** Estimates of future 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 benefit" between future normal cost and actuarial accrued liabilities. Sometimes referred to as the "actuarial funding method."

***Actuarial Equivalent*.** One series of payments is said to be actuarially equivalent to another series of payments if the two series have the same actuarial present value.

Actuarial Gain (Loss). The difference between actual unfunded actuarial accrued liabilities and anticipated unfunded actuarial accrued liabilities – during the period between two valuation dates. It is a measurement of the difference between actual and expected experience.

***Actuarial Present Value*.** The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

***Actuary*.** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation ASA, and ultimately to Fellowship with the designation of FSA.

***Amortization*.** Paying off an interest-discounted amount with periodic payments of interest and (generally) principal – as opposed to paying it off with a lump sum payment.

***Credited Projected Benefit*.** The portion of a member's projected benefit attributable to service before the valuation date – allocated based on the ratio of accrued service to projected total service and based on anticipated future compensation.

Normal Cost. The portion of the actuarial present value of future benefits that is assigned to the current year by the actuarial cost method. Sometimes referred to as "current service cost."

Definitions of Technical Terms (Concluded)

***Unfunded Actuarial Accrued Liabilities*.** The difference between actuarial accrued liabilities and valuation assets. Sometimes referred to as "unfunded past service liability" or "unfunded supplemental present value."

Most retirement systems have unfunded actuarial accrued liabilities. They arise each time new benefits are added and each time an actuarial loss occurs.

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

***Valuation Assets*.** The value of cash, investments and other property belonging to a pension plan, as used for the purpose of an actuarial valuation.