Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report
December 31, 2021 - Leelanau Co (4501)

Spring, 2022

Leelanau Co

In care of:
Municipal Employees' Retirement System of Michigan
1134 Municipal Way
Lansing, Michigan 48917

This report presents the results of the Annual Actuarial Valuation, prepared for Leelanau Co (4501) as of December 31, 2021. The report includes the determination of liabilities and contribution rates resulting from the participation in the Municipal Employees' Retirement System of Michigan ("MERS"). This report contains the minimum actuarially determined contribution requirement, in alignment with the MERS Plan Document, Actuarial Policy, the Michigan Constitution, and governing statutes. Leelanau Co is responsible for the employer contributions needed to provide MERS benefits for its employees and former employees.

The purposes of this valuation are to:

- Measure funding progress as of December 31, 2021,
- Establish contribution requirements for the fiscal year beginning January 1, 2023,
- Provide information regarding the identification and assessment of risk,
- Provide actuarial information in connection with applicable Governmental Accounting Standards Board (GASB) statements, and
- Provide information to assist the local unit of government with state reporting requirements.

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 December 31, 2021. The valuation was based upon information furnished by MERS 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 MERS.

The Municipal Employees' Retirement Act, PA 427 of 1984 and the MERS' Plan Document Article VI Sec. 71 (1)(d), provides the MERS Board with the authority to set actuarial assumptions and methods after consultation with the actuary. As the fiduciary of the plan, the MERS Retirement Board sets certain assumptions for funding and GASB purposes. These assumptions are reviewed regularly through a comprehensive study, most recently in the Fall of 2021. The MERS Retirement Board adopted a Dedicated Gains Policy at the February 17, 2022 Board meeting. The Dedicated Gains Policy will automatically reduce the assumed rate of investment return in conjunction with recognizing excess investment gains to mitigate the impact on employer contributions the first year. The new policy is effective with this December 31, 2021 annual actuarial valuation, and is reflected in the funded status and fiscal year 2023 contributions as shown in the Executive Summary.

The Michigan Department of Treasury provides required assumptions to be used for purposes of Public Act 202 reporting. These assumptions are for reporting purposes only and do not impact required contributions. Please refer to the State Reporting page found at the end of this report for information for this filing.

For a full list of all the assumptions used, please refer to the division-specific assumptions described in table(s) in this report, and to the Appendix on the MERS website at:
https://www.mersofmich.com/Portals/0/Assets/Resources/AAV-Appendix/MERS-2021AnnualActuarialValuation-Appendix.pdf

The actuarial assumptions used for this valuation, including the assumed rate of investment return, are reasonable for purposes of the measurement.

This report reflects the impact of COVID-19 experience through December 31, 2021. It does not reflect the ongoing impact of COVID-19, which is likely to influence demographic and economic experience, at least in the short term. We will continue to monitor these developments and their impact on the MERS Defined Benefit and Hybrid plans. Actual future experience will be reflected in each subsequent annual valuation, as experience emerges.

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 Leelanau Co 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.

David T. Kausch, Rebecca L. Stouffer, and Mark Buis are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor. GRS maintains independent consulting agreements with certain local units of government for services unrelated to the actuarial consulting services provided in this report.

The Retirement Board of the Municipal Employees' Retirement System of Michigan confirms that the System provides for payment of the required employer contribution as described in Section 20m of Act No. 314 of 1965 (MCL 38.1140m).

This information is purely actuarial in nature. It is not intended to serve as a substitute for legal, accounting, or investment advice.

This report was prepared at the request of the MERS Retirement Board and may be provided only in its entirety by the municipality to other interested parties (MERS customarily provides the full report on request to associated third parties such as the auditor for the municipality). GRS is not responsible for the consequences of any unauthorized use. 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.

If you have reason to believe that the plan provisions are incorrectly described, that important plan provisions relevant to this valuation are not described, that conditions have changed since the calculations were made, that the information provided in this report is inaccurate or is in anyway incomplete, or if you need further information in order to make an informed decision on the subject matter in this report, please contact your Regional Manager at 1.800.767.MERS (6377).

Sincerely,
Gabriel, Roeder, Smith & Company

David T Kausch

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Executive Summary

Funded Ratio

The funded ratio of a plan is the percentage of the dollar value of the actuarial accrued liability that is covered by the actuarial value of assets. While the funded ratio may be a useful plan measurement, understanding a plan's funding trend may be more important than a particular point in time. Refer to Table 7 to find a history of this information.

	12/31/2021	12/31/2020
Funded Ratio*	89%	83%

* Reflects assets from Surplus divisions, if any.

Throughout this report are references to valuation results generated prior to the 2018 valuation date. Results prior to 2018 were received directly from the prior actuary or extracted from the previous valuation system by MERS's technology service provider.

Required Employer Contributions

Your required employer contributions are shown in the following table. Employee contributions, if any, are in addition to the employer contributions.

Effective for the December 31, 2021 valuation, the MERS Retirement Board has adopted a Dedicated Gains Policy which allows for recognition of asset gains in excess of a set threshold in combination with lowering the assumed rate of investment return (discussed below). Changes to these assumptions and methods are effective for contributions beginning in 2023. Effective with the 2020 and 2019 valuations respectively, the MERS Retirement Board adopted updated demographic and economic assumptions. The combined impact of the prior demographic and economic assumption changes may be phased in. The remaining combined phase-in period is three years for all assumption changes.

By default, MERS will invoice you based on the amount in the "No Phase-in" columns. This amount will be considered the minimum required contribution unless you request to be billed the "Phase-in" rates. If you wish to be billed using the phased-in rates, please contact MERS, at which point the alternate minimum required contribution will be the amount in the "Phase-in" columns.

	Percentage of Payroll				Monthly $ Based on Projected Payroll			
	Phase-in	No Phase-in	Phase-in	No Phase-in	Phase-in	No Phase-in	Phase-in	No Phase-in
Valuation Date:	12/31/2021	12/31/2021	12/31/2020	12/31/2020	12/31/2021	12/31/2021	12/31/2020	12/31/2020
Fiscal Year Beginning:	January 1, 2023	January 1, 2023	January 1, 2022	January 1, 2022	January 1, 2023	January 1, 2023	January 1, 2022	January 1, 2022
Division								
01 - General	-	-	-	-	$ 7,885	$ 9,179	$ 10,848	$ 12,789
02 - POAM	-	-	-	-	8,616	10,688	12,508	15,616
11 - Non-Union	-	-	-	-	13,807	16,251	18,148	21,814
12 - All Employees	8.07%	8.20%	7.65%	7.87%	26,136	26,562	21,910	22,549
20 - COAM	-	-	-	-	14,498	15,844	11,122	13,141
Total Municipality - Estimated Monthly Contribution					**$ 70,942**	**$ 78,524**	**$ 74,536**	**$ 85,909**
Total Municipality - Estimated Annual Contribution					**$ 851,304**	**$ 942,288**	**$ 894,432**	**$ 1,030,908**

Employee contribution rates:

	Employee Contribution Rate	
Valuation Date:	12/31/2021	12/31/2020
Division		
01 - General	3.50%	3.50%
02 - POAM	2.92%	2.92%
11 - Non-Union	0.00%	0.00%
12 - All Employees	2.00%	2.00%
20 - COAM	2.92%	2.92%

The employer may contribute more than the minimum required contributions, as these additional contributions will earn investment income and may result in lower future contribution requirements. Employers making contributions in excess of the minimum requirements may elect to apply the excess contribution immediately to a particular division, or segregate the excess into one or more of what MERS calls "Surplus" divisions. An election in the first case would immediately reduce any unfunded accrued liability and lower the amortization payments throughout the remaining amortization period. An election to set up Surplus divisions would not immediately lower future contributions, however the assets from the Surplus division could be transferred to an unfunded division in the future to reduce the unfunded liability in future years, or to be used to pay all or a portion of the minimum required contribution in a future year. For purposes of this report, the assets in any Surplus division have been included in the municipality's total assets, unfunded accrued liability, and funded status; however, these assets are not used in calculating the minimum required contribution.

MERS strongly encourages employers to contribute more than the minimum contribution shown above. With the implemented Dedicated Gains policy, market gains and losses will continue to be smoothed over five years; however, since excess return are being used to lower the investment assumption, there will be less gains to smooth in down markets. Having additional funds in Surplus divisions will assist plans with navigating any market volatility.

Assuming that experience of the plan meets actuarial assumptions:

- To accelerate to a 100% funding ratio in 10 years, estimated monthly employer contributions for the fiscal year beginning in 2023 for the entire employer would be $91,991, instead of $78,524.

How and Why Do These Numbers Change?

In a defined benefit plan, contributions vary from one annual actuarial valuation to the next as a result of the following:

- Changes in benefit provisions (see Table 2),
- Changes in actuarial assumptions and methods (see the Appendix), and
- Experience of the plan (investment experience and demographic experience); this is the difference between actual experience of the plan and the actuarial assumptions.

These impacts are reflected in various tables in the report. For more information, please contact your Regional Manager.

Comments on Investment Rate of Return Assumption

A defined benefit plan is funded by employer contributions, participant contributions, and investment earnings. Investment earnings have historically provided a significant portion of the funding. The larger the share of benefits being provided from investment returns, the smaller the required contributions, and vice versa. Determining the contributions required to prefund the promised retirement benefits requires an assumption of what investment earnings are expected to add to the fund over a long period of time. This is called the **Investment Return Assumption**.

The MERS Investment Return Assumption is **7.00%** per year. This, along with all of our other actuarial assumptions, is reviewed at least every five years in an Experience Study that compares the assumptions used against actual experience and recommends adjustments if necessary. If your municipality would like to explore contributions at lower assumed investment return assumptions, please review the "What If" projection scenarios later in this report.

Assumption and Method Change in 2021

Effective February 17, 2022, the MERS Retirement Board adopted a dedicated gains policy that automatically adjusts the assumed rate of investment return by using excess asset gains to mitigate large increases in required contributions to the Plan. Full details of this dedicated gains policy are available in the Actuarial Policy found on the MERS website. Some goals of the dedicated gains policy are to:

- Provide a systematic approach to lower the assumed rate of investment return between experience studies, and

- Use excess gains to cover both the increase in normal cost and any increase in UAL payment the first year after implementation (i.e., minimize the first-year impact (i.e., increase) in employer contributions).

The dedicated gains policy has been implemented with the December 31, 2021 annual actuarial valuation. After initial application of the smoothing method, remaining market gains were used to lower the assumed rate of investment return from 7.35% to 7.00%. The December 31, 2021 valuation liabilities were developed using this new, lower assumption. Additionally, as a result of recognizing excess market gains, the valuation assets used to fund these liabilities are 7.2% higher than if there were no dedicated gain policy. The combined impact of these changes will minimize the first-year impact on employer contributions and may result in an increase or a decrease in employer contributions.

Comments on Asset Smoothing

To avoid dramatic spikes and dips in annual contribution requirements due to short-term fluctuations in asset markets, MERS applies a technique called **asset smoothing**. This spreads out each year's investment gains or losses over the prior year and the following four years. After initial application of asset smoothing, remaining excess market gains are used to buy down the assumed rate of investment return and increase the level of valuation assets, to the extent allowed by the dedicated gains policy. This smoothing method is used to determine your actuarial value of assets (valuation assets), which is then used to determine both your funded ratio and your required contributions. **The (smoothed) actuarial rate of return for 2021 was 17.04%, while the actual market rate of return was 13.97%.** To see historical details of the market rate of return compared to the smoothed actuarial rate of return, refer to this report's Appendix or view the "How Smoothing Works" video on the Defined Benefit resource page of the MERS website.

As of December 31, 2021, the actuarial value of assets is just below 100% of market value due to asset smoothing and dedicated gains. This means that rate of return on the actuarial value of assets should exceed the actuarial assumption in the next few years provided that the annual market returns meet or exceed the 7.00% investment return assumption. When all assumptions are met, contribution rates are expected to stay approximately level as a percent of payroll (dollar amounts are expected to increase with wage inflation of 3.0% each year).

As of December 31, 2021, the market value of assets and actuarial value of assets are very similar, resulting in a funded percentage that is not materially different.

Alternate Scenarios to Estimate the Potential Volatility of Results ("What If Scenarios")

The calculations in this report are based on assumptions about long-term economic and demographic behavior. These assumptions will never materialize in a given year, except by coincidence. Therefore, the results will vary from one year to the next. The volatility of the results depends upon the characteristics of the plan. For example:

- Open divisions that have substantial assets compared to their active employee payroll will have more volatile employer contribution rates due to investment return fluctuations.
- Open divisions that have substantial accrued liability compared to their active employee payroll will have more volatile employer contribution rates due to demographic experience fluctuations.
- Small divisions will have more volatile contribution patterns than larger divisions because statistical fluctuations are relatively larger among small populations.
- Shorter amortization periods result in more volatile contribution patterns.

Many assumptions are important in determining the required employer contributions. In the following table, we show the impact of varying the Investment Return assumption. Lower investment returns would generally result in higher required employer contributions, and vice versa. The three economic scenarios below provide a quantitative risk assessment for the impact of investment returns on the plan's future financial condition for funding purposes.

The relative impact of the economic scenarios below will vary from year to year, as the participant demographics change. The impact of each scenario should be analyzed for a given year, not from year to year. The results in the table are based on the December 31, 2021 valuation and are for the municipality in total, not by division. These results do not reflect a phase-in of the impact of the actuarial assumptions updated in the 2020 and 2019 valuations. There is no phase-in with dedicated gains.

It is important to note that calculations in this report are mathematical estimates based upon assumptions regarding future events, which may or may not materialize. Actuarial calculations can and do vary from one valuation to the next, sometimes significantly depending on the group's size. Projections are not predictions. Future valuations will be based on actual future experience.

12/31/2021 Valuation Results	Lower Future Annual Returns	Lower Future Annual Returns	Valuation Assumptions
Investment Return Assumption	**5.00%**	**6.00%**	**7.00%**
Accrued Liability	$ 47,005,071	$ 41,716,933	$ 37,315,529
Valuation Assets[1]	$ 33,167,785	$ 33,167,785	$ 33,167,785
Unfunded Accrued Liability	$ 13,837,286	$ 8,549,148	$ 4,147,744
Funded Ratio	71%	80%	89%
Monthly Normal Cost	$ 88,271	$ 67,575	$ 51,849
Monthly Amortization Payment	$ 81,898	$ 53,905	$ 26,675
Total Employer Contribution[2]	$ 170,169	$ 121,480	$ 78,524

[1] The Valuation Assets include assets from Surplus divisions, if any.

[2] If assets exceed accrued liabilities for a division, the division may have an overfunding credit to reduce the division's employer contribution requirement. If the overfunding credit is larger than the normal cost, the division's full credit is included in the municipality's amortization payment above but the division's total contribution requirement is zero. This can cause the displayed normal cost and amortization payment to not add up to the displayed total employer contribution.

Projection Scenarios

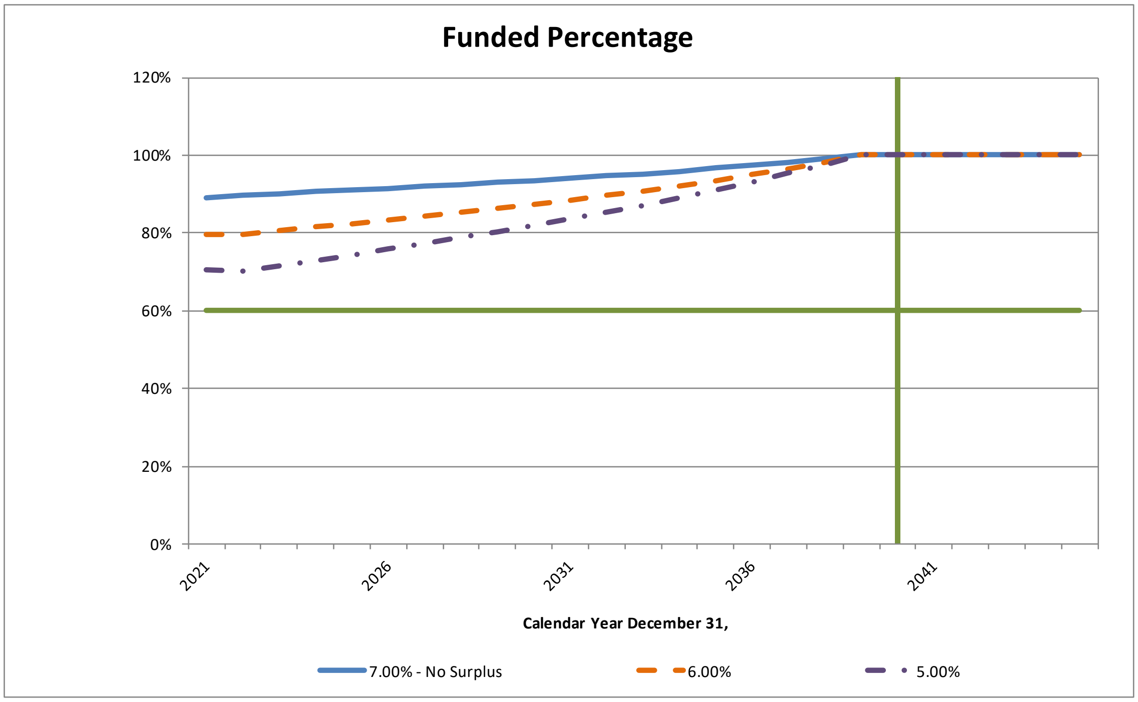
The next two pages show projections of the plan's funded ratio and computed employer contributions under the actuarial assumptions used in the valuation and alternate economic assumption scenarios. All three projections take into account the past investment experience that will continue to affect the actuarial rate of return in the short term.

The 7.00% scenario provides an estimate of computed employer contributions based on current actuarial assumptions, and a projected 7.00% market return. The other two scenarios may be useful if the municipality chooses to budget more conservatively and make contributions in addition to the minimum requirements. The 6.00% and 5.00% projection scenarios provide an indication of the potential required employer contribution if these assumptions were met over the long term.

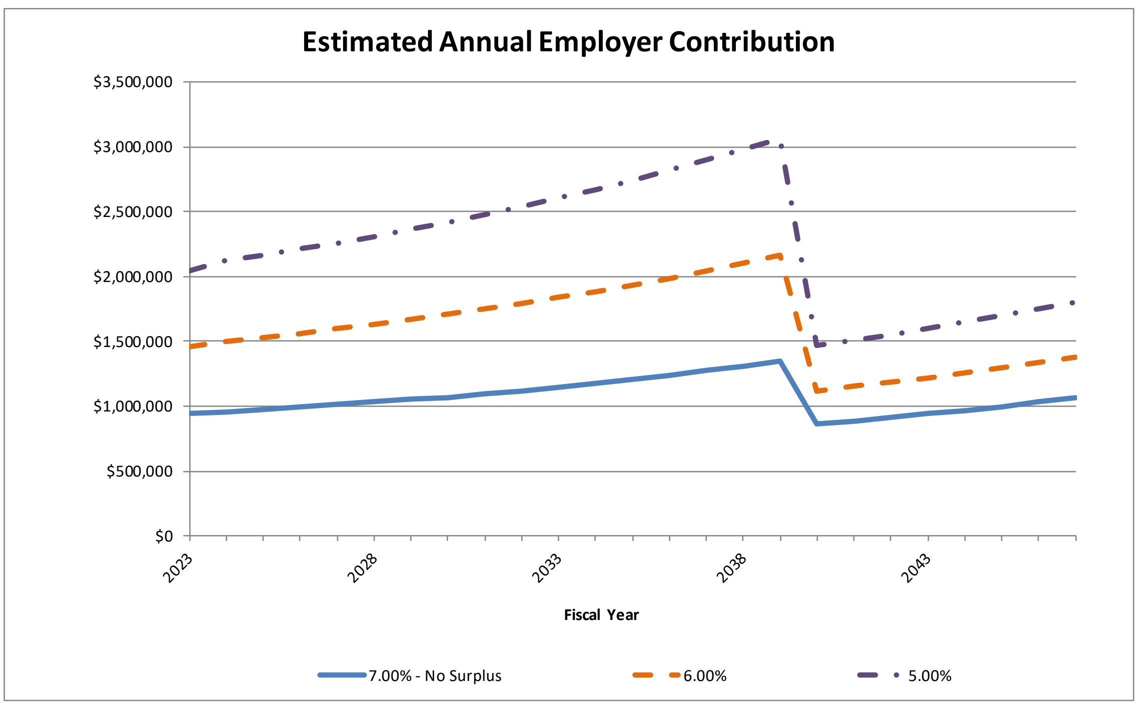
Valuation Year Ending 12/31	Fiscal Year Beginning 1/1	Actuarial Accrued Liability	Valuation Assets[2]	Funded Percentage	Estimated Annual Employer Contribution
7.00%[1] - NO PHASE-IN					
2021	2023	$ 37,315,529	$ 33,167,785	89%	$ 942,288
2022	2024	$ 38,700,000	$ 34,700,000	90%	$ 958,000
2023	2025	$ 39,900,000	$ 36,000,000	90%	$ 974,000
2024	2026	$ 41,000,000	$ 37,200,000	91%	$ 991,000
2025	2027	$ 42,000,000	$ 38,300,000	91%	$ 1,010,000
2026	2028	$ 43,100,000	$ 39,400,000	92%	$ 1,030,000
6.00%[1] - NO PHASE-IN					
2021	2023	$ 41,716,933	$ 33,167,785	80%	$ 1,457,760
2022	2024	$ 43,200,000	$ 34,400,000	80%	$ 1,500,000
2023	2025	$ 44,400,000	$ 35,800,000	81%	$ 1,530,000
2024	2026	$ 45,700,000	$ 37,200,000	81%	$ 1,560,000
2025	2027	$ 46,800,000	$ 38,600,000	82%	$ 1,600,000
2026	2028	$ 47,900,000	$ 39,900,000	83%	$ 1,630,000
5.00%[1] - NO PHASE-IN					
2021	2023	$ 47,005,071	$ 33,167,785	71%	$ 2,042,028
2022	2024	$ 48,600,000	$ 34,100,000	70%	$ 2,120,000
2023	2025	$ 49,900,000	$ 35,700,000	72%	$ 2,160,000
2024	2026	$ 51,300,000	$ 37,400,000	73%	$ 2,210,000
2025	2027	$ 52,500,000	$ 39,000,000	74%	$ 2,260,000
2026	2028	$ 53,700,000	$ 40,700,000	76%	$ 2,310,000

[1] Represents both the interest rate for discounting liabilities and the future investment return assumption on the Market Value of assets.

[2] Valuation Assets do not include assets from Surplus divisions, if any.



Notes:
All projected funded percentages are shown with no phase-in.
The green indicator lines have been added at 60% funded and 19 years following the valuation date for PA 202 purposes.



Notes:
All projected contributions are shown with no phase-in.

Table 1: Employer Contribution Details for the Fiscal Year Beginning January 1, 2023

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions[1]				Blended ER Rate No Phase-In[5]	Blended ER Rate With Phase-In[5]	Employee Contribut. Conversion Factor[2]
			Employer Normal Cost[6]	Payment of the Unfunded Accrued Liability[4]	Computed Employer Contribut. No Phase-In	Computed Employer Contribut. With Phase-In			
Percentage of Payroll									
01 - General	13.33%	3.50%	-	-	-	-	14.23%	12.85%	
02 - POAM	14.48%	2.92%	-	-	-	-	14.23%	12.85%	
11 - Non-Union	12.46%	0.00%	-	-	-	-	14.23%	12.85%	
12 - All Employees	9.98%	2.00%	7.98%	0.22%	8.20%	8.07%	14.23%	12.85%	0.86%
20 - COAM	13.63%	2.92%	-	-	-	-	14.23%	12.85%	
Estimated Monthly Contribution[3]									
01 - General			$ 3,276	$ 5,903	$ 9,179	$ 7,885			
02 - POAM			5,255	5,433	10,688	8,616			
11 - Non-Union			10,611	5,640	16,251	13,807			
12 - All Employees			25,855	707	26,562	26,136			
20 - COAM			6,852	8,992	15,844	14,498			
Total Municipality			**$ 51,849**	**$ 26,675**	**$ 78,524**	**$ 70,942**			
Estimated Annual Contribution[3]			**$ 622,188**	**$ 320,100**	**$ 942,288**	**$ 851,304**			

1 The above employer contribution requirements are in addition to the employee contributions, if any.

2 If employee contributions are increased/decreased by 1.00% of pay, the employer contribution requirement will decrease/increase by the Employee Contribution Conversion Factor. The conversion factor is usually under 1% because employee contributions may be refunded at termination of employment and not used to fund retirement pensions. Employer contributions will all be used to fund pensions.

3 For divisions that are open to new hires, estimated contributions are based on projected fiscal year payroll. Actual contributions will be based on actual reported monthly pays, and will be different from the above amounts. For divisions that will have no new hires (i.e., closed divisions), invoices will be based on the above dollar amounts which are based on projected fiscal year payroll. See description of Open Divisions and Closed Divisions in the Appendix.

4 Note that if the overfunding credit is larger than the normal cost, the full credit is shown above but the total contribution requirement is zero. This will cause the displayed normal cost and unfunded accrued liability contributions not to add across.

5 For linked divisions, the employer will be invoiced the Computed Employer Contribution No Phase-in rate shown above for each linked division (a contribution rate for the open division; a contribution dollar for the closed-but-linked division), unless the employer elects to contribute the Blended Employer Contribution rate shown above, by contacting MERS at 800-767-MERS (6377).

6 For divisions with a negative employer normal cost, employee contributions cover the normal cost and a portion of the payment of any unfunded accrued liability.

Please see the Comments on Asset Smoothing in the Executive Summary of this report.

Table 2: Benefit Provisions

01 - General: Closed to new hires, linked to Division 12	2021 Valuation	2020 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	50/25	50/25
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	3.50%	3.50%
Act 88:	Yes (Adopted 10/9/1984)	Yes (Adopted 10/9/1984)

02 - POAM: Closed to new hires, linked to Division 12	2021 Valuation	2020 Valuation
Benefit Multiplier:	2.50% Multiplier paid to Social Security Age, 2.25% Multiplier paid after Social Security Age (80% max)	2.50% Multiplier paid to Social Security Age, 2.25% Multiplier paid after Social Security Age (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	50/25	50/25
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	2.92%	2.92%
Act 88:	Yes (Adopted 10/9/1984)	Yes (Adopted 10/9/1984)

11 - Non-Union: Closed to new hires, linked to Division 12	2021 Valuation	2020 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	50/25	50/25
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	0.00%	0.00%
Act 88:	Yes (Adopted 10/9/1984)	Yes (Adopted 10/9/1984)

12 - All Employees: Open Division, linked to Division 01, 02, 11, 20

	2021 Valuation	2020 Valuation
Benefit Multiplier:	2.00% Multiplier (no max)	2.00% Multiplier (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	2.00%	2.00%
Act 88:	Yes (Adopted 10/9/1984)	Yes (Adopted 10/9/1984)

20 - COAM: Closed to new hires, linked to Division 12

	2021 Valuation	2020 Valuation
Benefit Multiplier:	2.50% Multiplier paid to Social Security Age, 2.25% Multiplier paid after Social Security Age (80% max)	2.50% Multiplier paid to Social Security Age, 2.25% Multiplier paid after Social Security Age (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	50/25	50/25
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	2.92%	2.92%
Act 88:	Yes (Adopted 10/9/1984)	Yes (Adopted 10/9/1984)

Table 3: Participant Summary

Division	2021 Valuation Number	2021 Valuation Annual Payroll[1]	2020 Valuation Number	2020 Valuation Annual Payroll[1]	2021 Valuation Average Age	2021 Valuation Average Benefit Service[2]	2021 Valuation Average Eligibility Service[2]
01 - General							
Active Employees	9	$ 456,276	10	$ 502,348	56.2	17.4	18.4
Vested Former Employees	6	53,626	7	72,611	55.8	9.6	15.7
Retirees and Beneficiaries	43	437,750	41	419,609	73.4		
Pending Refunds	7		8				
02 - POAM							
Active Employees	10	$ 653,556	14	$ 883,493	52.4	19.9	21.7
Vested Former Employees	8	107,368	8	107,368	47.8	10.2	13.9
Retirees and Beneficiaries	15	333,672	14	311,377	66.2		
Pending Refunds	13		13				
11 - Non-Union							
Active Employees	20	$ 1,262,307	19	$ 1,172,325	57.9	22.0	24.5
Vested Former Employees	2	12,468	3	14,003	42.1	5.0	12.4
Retirees and Beneficiaries	34	829,043	32	814,568	68.2		
Pending Refunds	0		0				
12 - All Employees							
Active Employees	69	$ 3,098,355	60	$ 2,705,202	46.8	4.3	6.4
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	5	33,531	2	10,015	64.6		
Pending Refunds	27		27				
20 - COAM							
Active Employees	10	$ 772,246	8	$ 599,397	43.7	19.0	19.0
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	10	250,548	10	250,548	64.4		
Pending Refunds	0		0				
Total Municipality							
Active Employees	**118**	**$ 6,242,740**	**111**	**$ 5,862,765**	**49.6**	**10.9**	**12.7**
Vested Former Employees	**16**	**173,462**	**18**	**193,982**	**50.1**	**9.3**	**14.4**
Retirees and Beneficiaries	**107**	**1,884,544**	**99**	**1,806,117**	**69.5**		
Pending Refunds	**47**		**48**				
Total Participants	**288**		**276**				

[1] Annual payroll for active employees; annual deferred benefits payable for vested former employees; annual benefits being paid for retirees and beneficiaries.

[2] Descriptions can be found under Miscellaneous and Technical Assumptions in the Appendix.

Table 4: Reported Assets (Market Value)

Division	2021 Valuation		2020 Valuation	
	Employer and Retiree[1]	Employee[2]	Employer and Retiree[1]	Employee[2]
01 - General	$ 5,407,934	$ 145,341	$ 4,851,643	$ 150,999
02 - POAM	6,258,959	175,549	6,080,866	202,301
11 - Non-Union	13,856,160	71,476	12,114,735	42,876
12 - All Employees	2,145,098	275,084	1,581,612	245,746
20 - COAM	4,629,469	251,776	3,963,552	128,684
Municipality Total[3]	**$ 32,297,619**	**$ 919,227**	**$ 28,592,408**	**$ 770,606**
Combined Assets[3]	**$33,216,846**		**$29,363,014**	

[1] Reserve for Employer Contributions and Benefit Payments.

[2] Reserve for Employee Contributions.

[3] Totals may not add due to rounding.

The December 31, 2021 valuation assets (actuarial value of assets) are equal to 0.998523 times the reported market value of assets (compared to 0.972357 as of December 31, 2020). Refer to the Appendix for a description of the valuation asset derivation and a detailed calculation of valuation assets.

Table 5: Flow of Valuation Assets

Year Ended 12/31	Employer Contributions Required	Employer Contributions Additional	Employee Contributions	Investment Income (Valuation Assets)	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
2011	$ 776,844	$ 1,180,000	$ 45,235	$ 1,113,758	$ (745,163)	$ 0	$ 0	$ 16,228,305
2012	758,578	250,000	42,271	838,302	(838,498)	(465)	0	17,278,493
2013	726,204	250,000	48,561	1,073,166	(997,291)	0	0	18,379,133
2014	692,205	1,133,467	51,326	1,125,061	(1,220,866)	0	0	20,160,326
2015	767,785	1,000,000	67,002	1,129,291	(1,267,094)	(52)	14,071	21,871,329
2016	737,142	900,000	61,612	1,249,140	(1,335,508)	(3,437)	0	23,480,278
2017	796,797	675,000	69,384	1,466,645	(1,468,813)	(2,628)	0	25,016,663
2018	807,557	519,660	89,968	941,030	(1,532,396)	0	51,438	25,893,920
2019	752,046	276,628	111,720	1,249,092	(1,550,819)	0	0	26,732,587
2020	771,752	363,392	121,624	2,169,542	(1,660,402)	(3,172)	56,009	28,551,332
2021	933,784	500,000	122,315	4,843,125	(1,858,486)	(8,389)	84,104	33,167,785

Notes:

Transfers in and out are usually related to the transfer of participants between municipalities, and to employer and employee payments for service credit purchases (if any) that the governing body has approved.

The investment income column reflects the recognized investment income based on Valuation Assets. It does not reflect the market value investment return in any given year.

The Valuation Asset balance includes assets from Surplus divisions, if any.

Years where historical information is not available will be displayed with zero values.

Table 6: Actuarial Accrued Liabilities and Valuation Assets as of December 31, 2021

Division	Actuarial Accrued Liability					Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
	Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total			
01 - General	$ 1,867,088	$ 440,332	$ 4,149,641	$ 14,623	$ 6,471,684	$ 5,545,072	85.7%	$ 926,612
02 - POAM	3,027,397	646,366	3,596,578	8,595	7,278,936	6,425,004	88.3%	853,932
11 - Non-Union	5,978,860	34,365	8,818,900	0	14,832,125	13,907,065	93.8%	925,060
12 - All Employees	2,082,862	0	407,824	26,984	2,517,670	2,416,608	96.0%	101,062
20 - COAM	3,505,925	0	2,709,189	0	6,215,114	4,874,036	78.4%	1,341,078
Total	**$ 16,462,132**	**$ 1,121,063**	**$ 19,682,132**	**$ 50,202**	**$ 37,315,529**	**$ 33,167,785**	**88.9%**	**$ 4,147,744**

The following results show the combined accrued liabilities and assets for each set of linked divisions. These results are already shown in the table on the prior page(s).

Table 6 (continued)

Division	Actuarial Accrued Liability					Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
	Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total			
Linked Divisions 12, 01, 02, 11, 20	$ 16,462,132	$ 1,121,063	$ 19,682,132	$ 50,202	$ 37,315,529	$ 33,167,785	88.9%	$ 4,147,744

Please see the Comments on Asset Smoothing in the Executive Summary of this report.

The December 31, 2021 valuation assets (actuarial value of assets) are equal to 0.998523 times the reported market value of assets. Refer to the Appendix for a description of the valuation asset derivation and a detailed calculation of valuation assets.

Table 7: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2007	$ 16,059,809	$ 11,255,186	70%	$ 4,804,623
2008	17,122,237	12,065,717	70%	5,056,520
2009	17,640,453	12,948,760	73%	4,691,693
2010	18,800,296	13,857,631	74%	4,942,665
2011	20,205,905	16,228,305	80%	3,977,600
2012	21,379,708	17,278,493	81%	4,101,215
2013	22,782,371	18,379,133	81%	4,403,238
2014	24,350,649	20,160,326	83%	4,190,323
2015	27,376,649	21,871,329	80%	5,505,320
2016	27,975,859	23,480,278	84%	4,495,581
2017	29,076,480	25,016,663	86%	4,059,817
2018	29,750,413	25,893,920	87%	3,856,493
2019	31,850,702	26,732,587	84%	5,118,115
2020	34,464,498	28,551,332	83%	5,913,166
2021	37,315,529	33,167,785	89%	4,147,744

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012, 2015, 2019, 2020 and 2021 actuarial valuations.

The Valuation Assets include assets from Surplus divisions, if any.

Years where historical information is not available will be displayed with zero values.

Throughout this report are references to valuation results generated prior to the 2018 valuation date. Results prior to 2018 were received directly from the prior actuary or extracted from the previous valuation system by MERS's technology service provider.

Tables 8 and 9: Division-Based Comparative Schedules

Division 01 - General

Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 4,358,218	$ 3,393,948	78%	$ 964,270
2012	4,513,334	3,449,403	76%	1,063,931
2013	4,716,823	3,576,682	76%	1,140,141
2014	4,920,438	3,627,724	74%	1,292,714
2015	5,458,598	4,431,423	81%	1,027,175
2016	5,253,963	4,350,946	83%	903,017
2017	5,827,538	4,825,538	83%	1,002,000
2018	5,704,924	4,732,421	83%	972,503
2019	5,951,105	4,741,172	80%	1,209,933
2020	6,282,971	4,864,354	77%	1,418,617
2021	6,471,684	5,545,072	86%	926,612

Notes: Actuarial assumptions were revised for the 2011, 2012, 2015, 2019, 2020 and 2021 actuarial valuations.

The percent funded does not reflect valuation assets from Surplus divisions, if any.

Table 9-01: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2011	28	$ 928,336	14.19%	2.52%
2012	27	853,762	16.12%	2.52%
2013	23	780,187	17.44%	2.52%
2014	22	762,027	18.94%	2.52%
2015	19	712,390	17.94%	2.52%
2016	15	573,404	19.16%	2.52%
2017	18	781,842	$ 11,336	2.52%
2018	13	592,349	$ 9,313	3.50%
2019	11	528,967	$ 11,240	3.50%
2020	10	502,348	$ 12,789	3.50%
2021	9	456,276	$ 9,179	3.50%

1 For open divisions, a percent of pay contribution is shown. For closed divisions, a monthly dollar contribution is shown.

2 For each valuation year, the computed employer contribution is based on the employee rate. If the employee rate changes during the applicable fiscal year, the computed employer contribution will be adjusted.

Note: The contributions shown in Table 9 reflect the employer contribution requirement without phase-in. If applicable, the current phase-in contribution is shown in Table 1.

See the Benefit Provision History, later in this report, for past benefit provision changes.

Years where historical information is not available will be displayed with zero values.

Division 02 - POAM

Table 8-02: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 4,244,967	$ 3,428,464	81%	$ 816,503
2012	4,384,769	3,591,710	82%	793,059
2013	4,845,867	3,867,872	80%	977,995
2014	5,303,455	4,109,591	78%	1,193,864
2015	6,069,104	4,642,753	77%	1,426,351
2016	6,001,055	4,845,325	81%	1,155,730
2017	6,193,805	5,092,638	82%	1,101,167
2018	6,338,981	5,386,757	85%	952,224
2019	6,789,733	5,633,507	83%	1,156,226
2020	7,431,214	6,109,481	82%	1,321,733
2021	7,278,936	6,425,004	88%	853,932

Notes: Actuarial assumptions were revised for the 2011, 2012, 2015, 2019, 2020 and 2021 actuarial valuations.

The percent funded does not reflect valuation assets from Surplus divisions, if any.

Table 9-02: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2011	28	$ 1,489,985	12.95%	0.92%
2012	27	1,389,075	13.56%	0.92%
2013	26	1,381,027	14.41%	0.92%
2014	25	1,358,201	15.31%	0.92%
2015	24	1,427,268	16.60%	0.92%
2016	22	1,222,115	16.27%	0.92%
2017	19	1,062,341	$ 15,485	0.92%
2018	18	1,096,439	$ 13,983	1.92%
2019	17	1,054,399	$ 14,758	2.92%
2020	14	883,493	$ 15,616	2.92%
2021	10	653,556	$ 10,688	2.92%

1 For open divisions, a percent of pay contribution is shown. For closed divisions, a monthly dollar contribution is shown.

2 For each valuation year, the computed employer contribution is based on the employee rate. If the employee rate changes during the applicable fiscal year, the computed employer contribution will be adjusted.

Note: The contributions shown in Table 9 reflect the employer contribution requirement without phase-in. If applicable, the current phase-in contribution is shown in Table 1.

See the Benefit Provision History, later in this report, for past benefit provision changes.

Years where historical information is not available will be displayed with zero values.

Division 11 - Non-Union

Table 8-11: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 8,957,485	$ 7,207,491	81%	$ 1,749,994
2012	9,642,244	7,889,555	82%	1,752,689
2013	10,259,295	8,427,379	82%	1,831,916
2014	10,819,898	9,838,294	91%	981,604
2015	11,988,610	9,994,072	83%	1,994,538
2016	12,266,860	10,692,141	87%	1,574,719
2017	11,902,609	11,049,873	93%	852,736
2018	12,093,236	11,338,614	94%	754,622
2019	12,846,802	11,332,216	88%	1,514,586
2020	13,685,434	11,821,539	86%	1,863,895
2021	14,832,125	13,907,065	94%	925,060

Notes: Actuarial assumptions were revised for the 2011, 2012, 2015, 2019, 2020 and 2021 actuarial valuations.

The percent funded does not reflect valuation assets from Surplus divisions, if any.

Table 9-11: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2011	46	$ 1,969,910	16.22%	0.00%
2012	36	1,733,311	$ 22,086	0.00%
2013	34	1,670,458	$ 22,462	0.00%
2014	31	1,601,427	$ 17,818	0.00%
2015	27	1,548,034	$ 25,033	0.00%
2016	26	1,474,827	$ 21,921	0.00%
2017	21	1,193,921	$ 14,791	0.00%
2018	21	1,227,536	$ 14,557	0.00%
2019	21	1,276,122	$ 19,918	0.00%
2020	19	1,172,325	$ 21,814	0.00%
2021	20	1,262,307	$ 16,251	0.00%

1 For open divisions, a percent of pay contribution is shown. For closed divisions, a monthly dollar contribution is shown.

2 For each valuation year, the computed employer contribution is based on the employee rate. If the employee rate changes during the applicable fiscal year, the computed employer contribution will be adjusted.

Note: The contributions shown in Table 9 reflect the employer contribution requirement without phase-in. If applicable, the current phase-in contribution is shown in Table 1.

See the Benefit Provision History, later in this report, for past benefit provision changes.

Years where historical information is not available will be displayed with zero values.

Division 12 - All Employees

Table 8-12: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 0	$ 0	0%	$ 0
2012	7,797	4,255	55%	3,542
2013	58,472	64,460	110%	(5,988)
2014	148,608	130,419	88%	18,189
2015	293,257	275,143	94%	18,114
2016	475,975	470,166	99%	5,809
2017	739,755	696,375	94%	43,380
2018	1,051,133	977,938	93%	73,195
2019	1,413,814	1,360,134	96%	53,680
2020	1,819,657	1,776,844	98%	42,813
2021	2,517,670	2,416,608	96%	101,062

Notes: Actuarial assumptions were revised for the 2011, 2012, 2015, 2019, 2020 and 2021 actuarial valuations.

The percent funded does not reflect valuation assets from Surplus divisions, if any.

Table 9-12: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2011	0	$ 0	$ 0	0.00%
2012	3	85,904	6.10%	2.00%
2013	19	562,929	7.83%	2.00%
2014	23	750,119	7.93%	2.00%
2015	34	1,130,932	7.97%	2.00%
2016	41	1,482,536	7.52%	2.00%
2017	48	1,846,805	7.70%	2.00%
2018	55	2,276,703	7.82%	2.00%
2019	60	2,539,489	7.77%	2.00%
2020	60	2,705,202	7.87%	2.00%
2021	69	3,098,355	8.20%	2.00%

1 For open divisions, a percent of pay contribution is shown. For closed divisions, a monthly dollar contribution is shown.

2 For each valuation year, the computed employer contribution is based on the employee rate. If the employee rate changes during the applicable fiscal year, the computed employer contribution will be adjusted.

Note: The contributions shown in Table 9 reflect the employer contribution requirement without phase-in. If applicable, the current phase-in contribution is shown in Table 1.

See the Benefit Provision History, later in this report, for past benefit provision changes.

Years where historical information is not available will be displayed with zero values.

Table 8-20: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 2,645,235	$ 2,198,402	83%	$ 446,833
2012	2,831,564	2,343,570	83%	487,994
2013	2,901,914	2,442,740	84%	459,174
2014	3,158,250	2,454,298	78%	703,952
2015	3,567,080	2,527,938	71%	1,039,142
2016	3,978,006	3,121,700	79%	856,306
2017	4,412,773	3,352,239	76%	1,060,534
2018	4,562,139	3,458,190	76%	1,103,949
2019	4,849,248	3,665,558	76%	1,183,690
2020	5,245,222	3,979,114	76%	1,266,108
2021	6,215,114	4,874,036	78%	1,341,078

Notes: Actuarial assumptions were revised for the 2011, 2012, 2015, 2019, 2020 and 2021 actuarial valuations.

The percent funded does not reflect valuation assets from Surplus divisions, if any.

Table 9-20: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2011	8	$ 484,021	13.78%	1.00%
2012	8	496,812	15.17%	1.00%
2013	7	469,001	15.23%	1.00%
2014	7	473,316	18.50%	1.00%
2015	6	428,371	25.00%	1.00%
2016	8	564,386	19.19%	1.00%
2017	8	580,404	$ 11,006	1.00%
2018	8	596,732	$ 11,146	1.92%
2019	8	607,376	$ 11,691	2.92%
2020	8	599,397	$ 13,141	2.92%
2021	10	772,246	$ 15,844	2.92%

1 For open divisions, a percent of pay contribution is shown. For closed divisions, a monthly dollar contribution is shown.

2 For each valuation year, the computed employer contribution is based on the employee rate. If the employee rate changes during the applicable fiscal year, the computed employer contribution will be adjusted.

Note: The contributions shown in Table 9 reflect the employer contribution requirement without phase-in. If applicable, the current phase-in contribution is shown in Table 1.

See the Benefit Provision History, later in this report, for past benefit provision changes.

Years where historical information is not available will be displayed with zero values.

Table 10: Division-Based Layered Amortization Schedule

Division 01 - General

Table 10-01: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 1,027,175	23	$ 1,037,019	17	$ 84,096
(Gain)/Loss	12/31/2016	(127,711)	22	(137,271)	17	(11,136)
(Gain)/Loss	12/31/2017	99,975	21	106,727	17	8,652
(Gain)/Loss	12/31/2018	(38,367)	20	(40,784)	17	(3,312)
Amendment	12/31/2018	(4,903)	20	(5,211)	17	(420)
(Gain)/Loss	12/31/2019	59,040	19	62,382	17	5,064
Assumption	12/31/2019	177,371	19	183,485	17	14,880
Experience	12/31/2020	193,017	18	205,272	17	16,644
Experience	12/31/2021	(502,796)	17	(537,992)	17	(43,632)
Total				**$ 873,627**		**$ 70,836**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

[3] This is the remaining balance as of the valuation date, projected to the beginning of the fiscal year shown above.

The unfunded accrued liability (UAL) as of December 31, 2021 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2021 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

Note: The original balance and original amortization periods prior to 12/31/2018 were received from the prior actuary.

Table 10-02: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
				Amounts for Fiscal Year Beginning 1/1/2023		
Initial	12/31/2015	$ 1,426,351	23	$ 1,468,784	17	$ 119,112
(Gain)/Loss	12/31/2016	(304,144)	22	(326,907)	17	(26,508)
(Gain)/Loss	12/31/2017	(43,589)	21	(46,543)	17	(3,780)
(Gain)/Loss	12/31/2018	(144,312)	20	(153,387)	17	(12,444)
Amendment	12/31/2018	(8,895)	20	(9,444)	17	(768)
(Gain)/Loss	12/31/2019	(1,417)	19	(1,494)	17	(120)
Assumption	12/31/2019	219,637	19	228,484	17	18,528
Amendment	12/31/2019	(7,350)	19	(7,765)	17	(636)
Experience	12/31/2020	151,635	18	161,264	17	13,080
Experience	12/31/2021	(475,599)	17	(508,891)	17	(41,268)
Total				**$ 804,101**		**$ 65,196**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

[3] This is the remaining balance as of the valuation date, projected to the beginning of the fiscal year shown above.

The unfunded accrued liability (UAL) as of December 31, 2021 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2021 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

Note: The original balance and original amortization periods prior to 12/31/2018 were received from the prior actuary.

Table 10-11: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 1,994,538	23	$ 2,121,722	17	$ 172,056
(Gain)/Loss	12/31/2016	(534,129)	22	(574,073)	17	(46,560)
(Gain)/Loss	12/31/2017	(698,794)	21	(746,078)	17	(60,504)
(Gain)/Loss	12/31/2018	(54,335)	20	(57,757)	17	(4,680)
(Gain)/Loss	12/31/2019	363,312	19	383,890	17	31,128
Assumption	12/31/2019	398,548	19	416,827	17	33,804
Experience	12/31/2020	294,732	18	313,435	17	25,416
Experience	12/31/2021	(956,309)	17	(1,023,251)	17	(82,980)
Total				**$ 834,715**		**$ 67,680**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

[3] This is the remaining balance as of the valuation date, projected to the beginning of the fiscal year shown above.

The unfunded accrued liability (UAL) as of December 31, 2021 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2021 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

Note: The original balance and original amortization periods prior to 12/31/2018 were received from the prior actuary.

Table 10-12: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 18,114	23	$ 19,192	17	$ 1,560
(Gain)/Loss	12/31/2016	(13,184)	22	(14,159)	17	(1,152)
(Gain)/Loss	12/31/2017	38,355	21	40,962	17	3,324
(Gain)/Loss	12/31/2018	26,804	20	28,479	17	2,316
(Gain)/Loss	12/31/2019	(47,190)	19	(49,861)	17	(4,044)
Assumption	12/31/2019	25,204	19	26,538	17	2,148
Experience	12/31/2020	(9,130)	18	(9,713)	17	(792)
Experience	12/31/2021	59,098	17	63,235	17	5,124
Total				**$ 104,673**		**$ 8,484**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

[3] This is the remaining balance as of the valuation date, projected to the beginning of the fiscal year shown above.

The unfunded accrued liability (UAL) as of December 31, 2021 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2021 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

Note: The original balance and original amortization periods prior to 12/31/2018 were received from the prior actuary.

Table 10-20: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 1,039,142	23	$ 1,084,754	17	$ 87,972
(Gain)/Loss	12/31/2016	(221,853)	22	(238,442)	17	(19,332)
(Gain)/Loss	12/31/2017	212,107	21	226,438	17	18,360
(Gain)/Loss	12/31/2018	24,828	20	26,382	17	2,136
Amendment	12/31/2018	(3,521)	20	(3,749)	17	(300)
(Gain)/Loss	12/31/2019	(74,981)	19	(79,229)	17	(6,420)
Assumption	12/31/2019	151,074	19	155,702	17	12,624
Amendment	12/31/2019	(3,171)	19	(3,343)	17	(276)
Experience	12/31/2020	78,962	18	83,970	17	6,816
Experience	12/31/2021	72,820	17	77,917	17	6,324
Total				**$ 1,330,400**		**$ 107,904**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

[3] This is the remaining balance as of the valuation date, projected to the beginning of the fiscal year shown above.

The unfunded accrued liability (UAL) as of December 31, 2021 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2021 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

Note: The original balance and original amortization periods prior to 12/31/2018 were received from the prior actuary.

GASB Statement No. 68 Information

The following information has been prepared to provide some of the information necessary to complete GASB Statement No. 68 disclosures. GASB Statement No. 68 is effective for fiscal years beginning after June 15, 2014. Additional resources, including an Implementation Guide, are available at http://www.mersofmich.com/.

Actuarial Valuation Date:		12/31/2021
Measurement Date of the Total Pension Liability (TPL):		12/31/2021
At 12/31/2021, the following employees were covered by the benefit terms:		
Inactive employees or beneficiaries currently receiving benefits:		107
Inactive employees entitled to but not yet receiving benefits (including refunds):		63
Active employees:		118
		288
Total Pension Liability as of 12/31/2020 measurement date:	$	33,572,432
Total Pension Liability as of 12/31/2021 measurement date:	$	36,331,490
Service Cost for the year ending on the 12/31/2021 measurement date:	$	655,592
Change in the Total Pension Liability due to:		
- Benefit changes[1]:	$	0
- Differences between expected and actual experience[2]:	$	156,449
- Changes in assumptions[2]:	$	1,308,417
Average expected remaining service lives of all employees (active and inactive):		3

[1] A change in liability due to benefit changes is immediately recognized when calculating pension expense for the year.

[2] Changes in liability due to differences between actual and expected experience, and changes in assumptions, are recognized in pension expense over the average remaining service lives of all employees.

Covered employee payroll (Needed for Required Supplementary Information):	$	6,242,740

Note: Covered employee payroll may differ from the GASB Statement No. 68 definition.

Sensitivity of the Net Pension Liability to changes in the discount rate:

	1% Decrease (6.25%)	Current Discount Rate (7.25%)	1% Increase (8.25%)
Change in Net Pension Liability as of 12/31/2021:	$ 4,209,884	$ 0	$ (3,542,687)

Note: The current discount rate shown for GASB Statement No. 68 purposes is higher than the MERS assumed rate of return. This is because for GASB Statement No. 68 purposes, the discount rate must be gross of administrative expenses, whereas for funding purposes it is net of administrative expenses.

GASB Statement No. 68 Information

This page is for those municipalities who need to "roll-forward" their total pension liability due to the timing of completion of the actuarial valuation in relation to their fiscal year-end.

The following information has been prepared to provide some of the information necessary to complete GASB Statement No. 68 disclosures. GASB Statement No. 68 is effective for fiscal years beginning after June 15, 2014. Additional resources, including an Implementation Guide, are available at www.mersofmich.com.

Actuarial Valuation Date:	12/31/2021
Measurement Date of the Total Pension Liability (TPL):	12/31/2022

At 12/31/2021, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits:	107
Inactive employees entitled to but not yet receiving benefits (including refunds):	63
Active employees:	118
	288

Total Pension Liability as of 12/31/2021 measurement date:	$	34,811,755
Total Pension Liability as of 12/31/2022 measurement date:	$	37,648,134
Service Cost for the year ending on the 12/31/2022 measurement date:	$	651,905
Change in the Total Pension Liability due to:		
- Benefit changes[1]:	$	0
- Differences between expected and actual experience[2]:	$	227,379
- Changes in assumptions[2]:	$	1,336,033
Average expected remaining service lives of all employees (active and inactive):		3

[1] A change in liability due to benefit changes is immediately recognized when calculating pension expense for the year.
[2] Changes in liability due to differences between actual and expected experience, and changes in assumptions, are recognized in pension expense over the average remaining service lives of all employees.

Covered employee payroll (Needed for Required Supplementary Information):	$	6,242,740

Note: Covered employee payroll may differ from the GASB Statement No. 68 definition.

Sensitivity of the Net Pension Liability to changes in the discount rate:

	1% Decrease (6.25%)	Current Discount Rate (7.25%)	1% Increase (8.25%)
Change in Net Pension Liability as of 12/31/2022:	$ 4,296,565	$ 0	$ (3,618,021)

Note: The current discount rate shown for GASB Statement No. 68 purposes is higher than the MERS assumed rate of return. This is because for GASB Statement No. 68 purposes, the discount rate must be gross of administrative expenses, whereas for funding purposes it is net of administrative expenses.

Benefit Provision History

The following benefit provision history is provided by MERS. Any corrections to this history or discrepancies between this information and information displayed elsewhere in the valuation report should be reported to MERS. All provisions are listed by date of adoption.

01 - General

1/1/2021	Voter-Elected Officials - Included
1/1/2021	Appointed Officials - Included
1/1/2021	Public Safety Employees - Yes
1/1/2021	Workers Compensation - Service Granted
1/1/2021	Service Credit Qualification - 20 hours
1/1/2021	Custom Wages
7/1/2018	Participant Contribution Rate 3.5%
12/1/2016	Service Credit Purchase Estimates - Yes
3/1/2007	Benefit B-4 (80% max)
3/1/2007	Benefit F50 (With 25 Years of Service)
3/1/2007	Member Contribution Rate 2.52%
1/1/2005	E 2% COLA Adopted (01/01/2005)
1/1/2004	E 2% COLA Adopted (01/01/2004)
1/1/2003	E 2% COLA Adopted (01/01/2003)
1/1/2002	E 2% COLA Adopted (01/01/2002)
1/1/2001	E 2% COLA Adopted (01/01/2001)
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1991	Benefit B-3 (80% max)
1/1/1991	Benefit F55 (With 25 Years of Service)
10/9/1984	Covered by Act 88
1/1/1983	Benefit C-1 (Old)
1/1/1982	Member Contribution Rate 0.00%
7/1/1968	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/1968	10 Year Vesting
7/1/1968	Benefit C (Old)
7/1/1968	Member Contribution Rate 3.00% Under $4,200.00 - Then 5.00%
7/1/1968	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

02 - POAM

1/1/2021	Public Safety Employees - Yes
1/1/2021	Workers Compensation - Service Granted
1/1/2021	Service Credit Qualification - 20 hours
1/1/2021	Custom Wages
7/1/2019	Participant Contribution Rate 2.92%
7/1/2018	Participant Contribution Rate 1.92%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2005	E 2% COLA Adopted (01/01/2005)
1/1/2004	E 2% COLA Adopted (01/01/2004)
1/1/2003	E 2% COLA Adopted (01/01/2003)
1/1/2002	E 2% COLA Adopted (01/01/2002)

02 - POAM

1/1/2001	E 2% COLA Adopted (01/01/2001)
1/1/2000	Benefit B-4/Base B-3 (80% max)
1/1/2000	Member Contribution Rate 0.92%
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1994	Benefit F50 (With 25 Years of Service)
1/1/1991	Benefit B-3 (80% max)
1/1/1991	Benefit F55 (With 25 Years of Service)
10/9/1984	Covered by Act 88
1/1/1983	Benefit C-1 (Old)
1/1/1982	Member Contribution Rate 0.00%
7/1/1968	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/1968	10 Year Vesting
7/1/1968	Benefit C (Old)
7/1/1968	Member Contribution Rate 3.00% Under $4,200.00 - Then 5.00%
7/1/1968	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

11 - Non-Union

1/1/2021	Part Time Employees - Included
1/1/2021	Public Safety Employees - Yes
1/1/2021	Workers Compensation - Service Granted
1/1/2021	Service Credit Qualification - 20 hours
1/1/2021	Custom Wages
12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2004	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/2004	10 Year Vesting
7/1/2004	Benefit B-4 (80% max)
7/1/2004	Benefit F50 (With 25 Years of Service)
7/1/2004	Member Contribution Rate 0.00%
10/9/1984	Covered by Act 88
7/1/1968	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

12 - All Employees

1/1/2021	Voter-Elected Officials - Included
1/1/2021	Part Time Employees - Included
1/1/2021	Appointed Officials - Included
1/1/2021	Public Safety Employees - Yes
1/1/2021	Workers Compensation - Service Granted
1/1/2021	Service Credit Qualification - 20 hours
1/1/2021	Custom Wages
12/1/2016	Service Credit Purchase Estimates - Yes
3/1/2012	Benefit FAC-5 (5 Year Final Average Compensation)
3/1/2012	10 Year Vesting
3/1/2012	Benefit B-2
3/1/2012	Member Contribution Rate 2.00%
10/9/1984	Covered by Act 88

12 - All Employees

7/1/1968	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

20 - COAM

1/1/2021	Public Safety Employees - Yes
1/1/2021	Workers Compensation - Service Granted
1/1/2021	Service Credit Qualification - 20 hours
1/1/2021	Custom Wages
7/1/2019	Participant Contribution Rate 2.92%
7/1/2018	Participant Contribution Rate 1.92%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2004	E 2% COLA Adopted (01/01/2004)
1/1/2002	E 2% COLA Adopted (01/01/2002)
1/1/2001	E 2% COLA Adopted (01/01/2001)
11/1/1999	Benefit FAC-5 (5 Year Final Average Compensation)
11/1/1999	10 Year Vesting
11/1/1999	Benefit B-4/Base B-3 (80% max)
11/1/1999	Benefit F50 (With 25 Years of Service)
11/1/1999	Member Contribution Rate 1.00%
1/1/1998	E 2% COLA Adopted (01/01/1998)
10/9/1984	Covered by Act 88
7/1/1968	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

Plan Provisions, Actuarial Assumptions, and Actuarial Funding Method

Details on MERS plan provisions, actuarial assumptions, and actuarial methodology can be found in the Appendix. Some actuarial assumptions are specific to this municipality and its divisions. These are listed below.

Increase in Final Average Compensation

Division	FAC Increase Assumption
All Divisions	1.00%

Miscellaneous and Technical Assumptions

Loads – None.

Amortization Policy for Closed Not Linked Divisions: The default funding policy for closed not linked divisions, including open divisions with zero active members, is to follow a non-accelerated amortization, where each closed period decreases by one year each year until the period is exhausted. In select instances, closed not linked division(s) may follow an accelerated amortization policy.

Risk Commentary

Determination of the accrued liability, the employer contribution, and the funded ratio 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, the actuarially determined contribution and the funded ratio 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 Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

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

- **Investment Risk** – actual investment returns may differ from the expected returns;
- **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;
- **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
- **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
- **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.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	12/31/2021	12/31/2020	12/31/2019	12/31/2018
1. Ratio of the market value of assets to total payroll	5.3	5.0	4.4	4.1
2. Ratio of actuarial accrued liability to payroll	6.0	5.9	5.3	5.1
3. Ratio of actives to retirees and beneficiaries	1.1	1.1	1.3	1.3
4. Ratio of market value of assets to benefit payments	17.8	17.7	17.0	15.4
5. Ratio of net cash flow to market value of assets (boy)	-0.8%	-1.3%	-1.7%	-0.3%

RATIO OF MARKET VALUE OF ASSETS TO TOTAL PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF MARKET VALUE OF ASSETS TO BENEFIT PAYMENTS

The MERS' Actuarial Policy requires a total minimum contribution equal to the excess (if any) of three times the expected annual benefit payments over the projected market value of assets as of the participating municipality or court's Fiscal Year for which the contribution applies. The ratio of market value of assets to benefit payments as of the valuation date provides an indication of whether the division is at risk for triggering the minimum contribution rule in the near term. If the division triggers this minimum contribution rule, the required employer contributions could increase dramatically relative to previous valuations.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

State Reporting

The following information has been prepared to provide some of the information necessary to complete the Public Act 202 pension reporting requirements for the State of Michigan's Local Government Retirement System Annual Report (Form No. 5572). Additional resources are available at www.mersofmich.com and on the State website.

Form 5572 Line Reference	Description	Result
10	**Membership as of December 31, 2021**	
11	Indicate number of active members	118
12	Indicate number of inactive members (excluding pending refunds)	16
13	Indicate number of retirees and beneficiaries	107
14	**Investment Performance for Calendar Year Ending December 31, 2021**[1]	
15	Enter actual rate of return - prior 1-year period	14.13%
16	Enter actual rate of return - prior 5-year period	9.96%
17	Enter actual rate of return - prior 10-year period	9.11%
18	**Actuarial Assumptions**	
19	Actuarial assumed rate of investment return[2]	7.00%
20	Amortization method utilized for funding the system's unfunded actuarial accrued liability, if any	Level Percent
21	Amortization period utilized for funding the system's unfunded actuarial accrued liability, if any[3]	17
22	Is each division within the system closed to new employees?[4]	No
23	**Uniform Assumptions**	
24	Enter retirement pension system's actuarial value of assets using uniform assumptions	$30,704,224
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions[5]	$37,926,870
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending December 31, 2022	$1,222,644

1. The Municipal Employees' Retirement System's investment performance has been provided to GRS from MERS Investment Staff and is included here for reporting purposes. The investment performance figures reported are net of investment expenses on a rolling calendar year basis for the previous 1-, 5-, and 10-year periods as required under PA 530.
2. Net of administrative and investment expenses.
3. Populated with the longest amortization period remaining in the amortization schedule, across all divisions in the plan. This is when each division and the plan in total is expected to reach 100% funded if all assumptions are met.
4. If all divisions within the employer are closed, "yes." If at least one division is open (including shadow divisions), "no."
5. Line 25 actuarial accrued liability is determined under PA 202 uniform assumptions which differ from the valuation assumptions. In particular, the assumed rate of return for PA 202 purposes is 6.85%.