Municipal Employees' Retirement System

Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report
December 31, 2021 - Manistee CRC (5103)

GRS

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Spring, 2022

Manistee CRC

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 Manistee CRC (5103) 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. Manistee CRC 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 October 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.

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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 Manistee CRC 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

David T. Kausch, FSA, FCA, EA, MAAA

Rebecca L. Stouffer

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Table of Contents

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*	73%	66%

* 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:	October 1, 2023	October 1, 2023	October 1, 2022	October 1, 2022	October 1, 2023	October 1, 2023	October 1, 2022	October 1, 2022
Division								
01 - General	-	-	-	-	$ 26,470	$ 28,078	$ 28,291	$ 30,730
10 - NonUnEmp	-	-	-	-	5,118	5,472	4,857	5,388
11 - Sr Adm Emp	-	-	-	-	0	0	0	0
12 - General hired after 7/1/09	-	-	-	-	1,380	1,522	2,072	2,285
13 - Non Union hired after 7/1/09	15.16%	15.30%	14.69%	14.97%	3,228	3,258	2,392	2,437
14 - Gnrl hired on/aftr 9/18/17	6.46%	6.60%	5.96%	6.24%	2,979	3,045	2,076	2,175
Total Municipality - Estimated Monthly Contribution					**$ 39,175**	**$ 41,375**	**$ 39,688**	**$ 43,015**
Total Municipality - Estimated Annual Contribution					**$ 470,100**	**$ 496,500**	**$ 476,256**	**$ 516,180**

Employee contribution rates:

	Employee Contribution Rate	
Valuation Date:	12/31/2021	12/31/2020
Division		
01 - General	5.00%	4.00%
10 - NonUnEmp	0.00%	0.00%
11 - Sr Adm Emp	5.90%	5.90%
12 - General hired after 7/1/09	5.00%	5.00%
13 - Non Union hired after 7/1/09	0.00%	0.00%
14 - Gnrl hired on/aftr 9/18/17	5.00%	5.00%

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 $54,971, instead of $41,375.

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	$ 17,214,050	$ 15,496,608	$ 14,037,701
Valuation Assets[1]	$ 10,293,552	$ 10,293,552	$ 10,293,552
Unfunded Accrued Liability	$ 6,920,498	$ 5,203,056	$ 3,744,149
Funded Ratio	60%	66%	73%
Monthly Normal Cost	$ 19,281	$ 14,556	$ 10,918
Monthly Amortization Payment	$ 38,596	$ 29,980	$ 21,504
Total Employer Contribution[2]	$ 64,627	$ 52,373	$ 41,375

[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

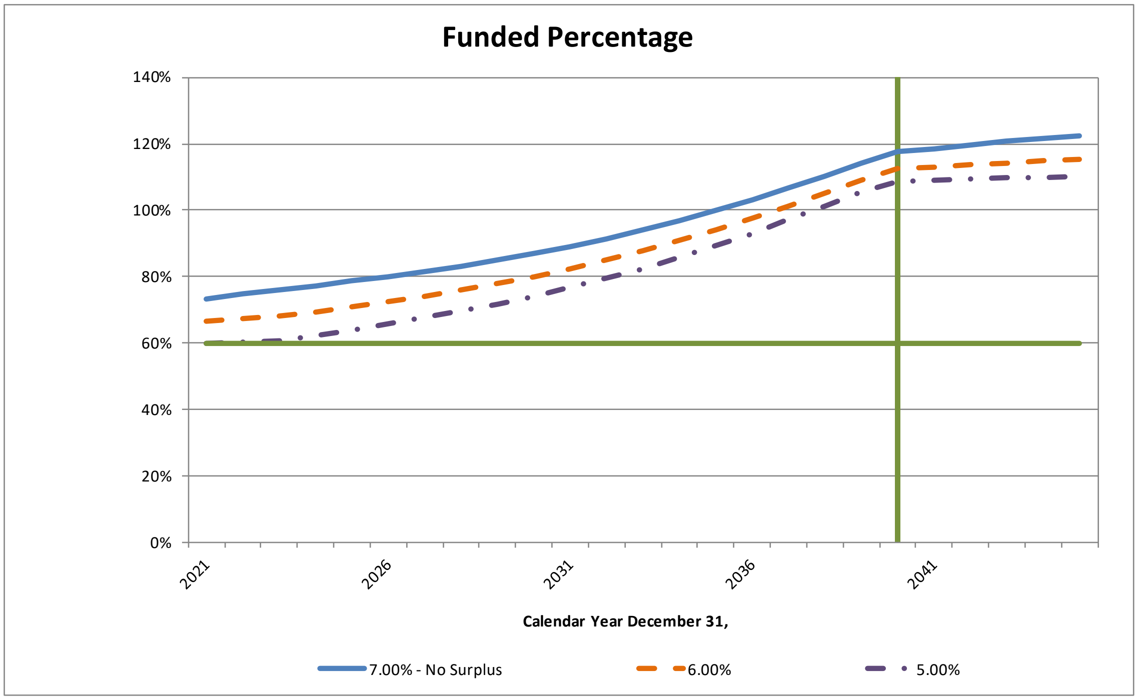
The next two pages show projections of the plan's funded ratio and computed employer contributions under the actuarial assumptions used in the valuation and alternate economic assumption scenarios. All three projections take into account the past investment experience that will continue to affect the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

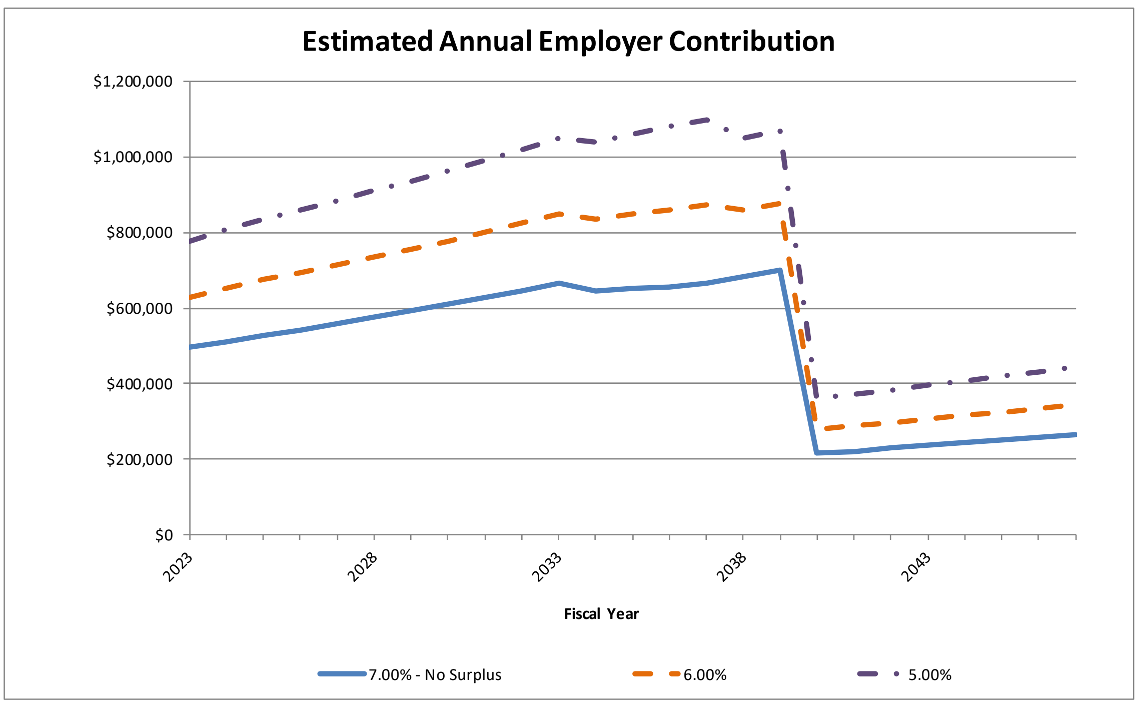
Valuation Year Ending 12/31	Fiscal Year Beginning 10/1	Actuarial Accrued Liability	Valuation Assets[2]	Funded Percentage	Estimated Annual Employer Contribution
7.00%[1] - NO PHASE-IN					
2021	2023	$ 14,037,701	$ 10,293,552	73%	$ 496,500
2022	2024	$ 14,400,000	$ 10,700,000	75%	$ 511,000
2023	2025	$ 14,500,000	$ 11,100,000	76%	$ 527,000
2024	2026	$ 14,700,000	$ 11,400,000	77%	$ 543,000
2025	2027	$ 14,900,000	$ 11,700,000	79%	$ 559,000
2026	2028	$ 15,000,000	$ 12,000,000	80%	$ 576,000
6.00%[1] - NO PHASE-IN					
2021	2023	$ 15,496,608	$ 10,293,552	66%	$ 628,476
2022	2024	$ 15,800,000	$ 10,600,000	67%	$ 651,000
2023	2025	$ 16,000,000	$ 10,900,000	68%	$ 675,000
2024	2026	$ 16,200,000	$ 11,200,000	69%	$ 694,000
2025	2027	$ 16,300,000	$ 11,600,000	71%	$ 714,000
2026	2028	$ 16,400,000	$ 11,900,000	73%	$ 735,000
5.00%[1] - NO PHASE-IN					
2021	2023	$ 17,214,050	$ 10,293,552	60%	$ 775,524
2022	2024	$ 17,500,000	$ 10,600,000	60%	$ 807,000
2023	2025	$ 17,700,000	$ 10,700,000	61%	$ 837,000
2024	2026	$ 17,900,000	$ 11,100,000	62%	$ 861,000
2025	2027	$ 18,000,000	$ 11,500,000	64%	$ 885,000
2026	2028	$ 18,100,000	$ 11,900,000	66%	$ 910,000

[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 October 1, 2023

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions[1]			Computed Employer Contribut. With Phase-In	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				
Percentage of Payroll									
01 - General	11.92%	5.00%	-	-	-	-	32.55%	30.74%	
10 - NonUnEmp	9.22%	0.00%	-	-	-	-	27.53%	26.32%	
11 - Sr Adm Emp	0.00%	5.90%	-	-	-	-			
12 - General hired after 7/1/09	13.00%	5.00%	-	-	-	-	32.55%	30.74%	
13 - Non Union hired after 7/1/09	15.30%	0.00%	15.30%	0.00%	15.30%	15.16%	27.53%	26.32%	0.92%
14 - Gnrl hired on/aftr 9/18/17	11.08%	5.00%	6.08%	0.52%	6.60%	6.46%	32.55%	30.74%	0.81%
Estimated Monthly Contribution[3]									
01 - General			$ 2,804	$ 25,274	$ 28,078	$ 26,470			
10 - NonUnEmp			960	4,512	5,472	5,118			
11 - Sr Adm Emp			0	(8,953)	0	0			
12 - General hired after 7/1/09			1,093	429	1,522	1,380			
13 - Non Union hired after 7/1/09			3,258	0	3,258	3,228			
14 - Gnrl hired on/aftr 9/18/17			2,803	242	3,045	2,979			
Total Municipality			**$ 10,918**	**$ 21,504**	**$ 41,375**	**$ 39,175**			
Estimated Annual Contribution[3]			**$ 131,016**	**$ 258,048**	**$ 496,500**	**$ 470,100**			

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 14

	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):	55/30	55/30
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	5.00%	4.00%
Act 88:	No	No

10 - NonUnEmp: Closed to new hires, linked to Division 13

	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):	55/30	55/30
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	0.00%	0.00%
Act 88:	No	No

11 - Sr Adm Emp: Closed to new hires

	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):	55/30	55/30
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	5.90%	5.90%
RS50% Percentage:	50%	50%
Act 88:	No	No

12 - General hired after 7/1/09: Closed to new hires, linked to Division 14

	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):	55/30	55/30
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	5.00%	5.00%
Act 88:	No	No

13 - Non Union hired after 7/1/09: Open Division, linked to Division 10

	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):	55/30	55/30
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	0.00%	0.00%
Act 88:	No	No

14 - Gnrl hired on/aftr 9/18/17: Open Division, linked to Division 01, 12

	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):	55/30	55/30
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	5.00%	5.00%
Act 88:	No	No

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	13	$ 572,212	13	$ 575,568	55.8	22.0	22.0
Vested Former Employees	1	27,939	1	27,939	58.8	23.8	25.0
Retirees and Beneficiaries	36	691,774	38	712,238	72.5		
Pending Refunds	0		0				
10 - NonUnEmp							
Active Employees	2	$ 131,803	2	$ 121,048	56.9	26.8	26.8
Vested Former Employees	2	29,670	2	29,670	53.8	9.1	13.3
Retirees and Beneficiaries	4	76,869	4	76,869	67.8		
Pending Refunds	0		0				
11 - Sr Adm Emp							
Active Employees	0	$ 0	0	$ 0	0.0	0.0	0.0
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	3	120,299	4	148,595	82.1		
Pending Refunds	0		0				
12 - General hired after 7/1/09							
Active Employees	4	$ 169,044	6	$ 248,406	52.9	11.3	11.3
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	1	2,773	1	2,773	61.5		
Pending Refunds	1		0				
13 - Non Union hired after 7/1/09							
Active Employees	4	$ 218,934	3	$ 169,790	46.6	4.1	6.9
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				
14 - Gnrl hired on/aftr 9/18/17							
Active Employees	9	$ 368,111	6	$ 246,599	45.0	2.4	4.4
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				
Total Municipality							
Active Employees	**32**	**$ 1,460,104**	**30**	**$ 1,361,411**	**51.3**	**13.2**	**14.1**
Vested Former Employees	**3**	**57,609**	**3**	**57,609**	**55.5**	**14.0**	**17.2**
Retirees and Beneficiaries	**44**	**891,715**	**47**	**940,475**	**72.5**		
Pending Refunds	**1**		**0**				
Total Participants	**80**		**80**				

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	$ 6,346,399	$ 80,792	$ 5,933,230	$ 57,297
10 - NonUnEmp	1,427,238	0	1,277,415	0
11 - Sr Adm Emp	1,710,865	0	1,497,462	0
12 - General hired after 7/1/09	324,896	80,525	279,821	70,243
13 - Non Union hired after 7/1/09	195,248	31,295	116,498	31,174
14 - Gnrl hired on/aftr 9/18/17	68,502	43,019	38,779	27,055
Municipality Total[3]	**$ 10,073,148**	**$ 235,631**	**$ 9,143,204**	**$ 185,770**
Combined Assets[3]	**$10,308,779**		**$9,328,974**	

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	$ 463,451	$ 240,000	$ 1,566	$ 337,527	$ (597,574)	$ 0	$ (160)	$ 6,104,733
2012	481,109	140,000	2,473	300,351	(637,577)	0	0	6,391,089
2013	568,099	100,000	2,811	400,307	(679,827)	0	0	6,782,479
2014	807,629	0	7,134	409,487	(688,035)	0	0	7,318,694
2015	831,470	0	9,697	399,309	(722,218)	0	0	7,836,952
2016	778,940	0	11,177	441,225	(753,996)	0	0	8,314,298
2017	464,381	101,136	18,774	497,704	(851,687)	0	0	8,544,606
2018	510,823	14,646	38,597	309,826	(854,316)	0	0	8,564,182
2019	516,725	15,621	51,499	397,878	(859,825)	0	0	8,686,080
2020	548,563	8,238	51,798	682,206	(905,793)	0	0	9,071,092
2021	573,159	4,593	49,136	1,526,879	(931,307)	0	0	10,293,552

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: Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
01 - General	$ 2,895,142	$ 302,584	$ 7,077,111	$ 0	$ 10,274,837	$ 6,417,698	62.5%	$ 3,857,139
10 - NonUnEmp	814,272	200,808	945,755	0	1,960,835	1,425,130	72.7%	535,705
11 - Sr Adm Emp	0	0	970,120	0	970,120	1,708,338	176.1%	(738,218)
12 - General hired after 7/1/09	429,939	0	36,819	8,886	475,644	404,822	85.1%	70,822
13 - Non Union hired after 7/1/09	215,168	0	0	0	215,168	226,208	105.1%	(11,040)
14 - Gnrl hired on/aftr 9/18/17	141,097	0	0	0	141,097	111,356	78.9%	29,741
Total	**$ 4,495,618**	**$ 503,392**	**$ 9,029,805**	**$ 8,886**	**$ 14,037,701**	**$ 10,293,552**	**73.3%**	**$ 3,744,149**

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)

	Actuarial Accrued Liability							
Division	**Active Employees**	**Vested Former Employees**	**Retirees and Beneficiaries**	**Pending Refunds**	**Total**	**Valuation Assets**	**Percent Funded**	**Unfunded (Overfunded) Accrued Liabilities**
Linked Divisions 13, 10	$ 1,029,440	$ 200,808	$ 945,755	$ 0	$ 2,176,003	$ 1,651,338	75.9%	$ 524,665
Linked Divisions 14, 01, 12	3,466,178	302,584	7,113,930	8,886	10,891,578	6,933,876	63.7%	3,957,702

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	$ 9,621,291	$ 4,572,900	48%	$ 5,048,391
2008	10,052,447	4,837,364	48%	5,215,083
2009	10,154,214	5,203,375	51%	4,950,839
2010	10,570,991	5,659,923	54%	4,911,068
2011	10,954,938	6,104,733	56%	4,850,205
2012	11,349,113	6,391,089	56%	4,958,024
2013	11,427,592	6,782,479	59%	4,645,113
2014	11,722,837	7,318,694	62%	4,404,143
2015	12,690,803	7,836,952	62%	4,853,851
2016	12,767,800	8,314,298	65%	4,453,502
2017	12,919,691	8,544,606	66%	4,375,085
2018	13,156,259	8,564,182	65%	4,592,077
2019	13,422,350	8,686,080	65%	4,736,270
2020	13,684,863	9,071,092	66%	4,613,771
2021	14,037,701	10,293,552	73%	3,744,149

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	$ 7,827,364	$ 5,581,060	71%	$ 2,246,304
2012	8,157,745	5,817,627	71%	2,340,118
2013	8,558,058	6,058,454	71%	2,499,604
2014	8,779,820	6,166,720	70%	2,613,100
2015	9,495,682	6,196,565	65%	3,299,117
2016	9,748,362	6,214,156	64%	3,534,206
2017	9,301,698	5,953,045	64%	3,348,653
2018	9,372,759	5,843,470	62%	3,529,289
2019	9,764,163	5,793,383	59%	3,970,780
2020	9,996,753	5,824,931	58%	4,171,822
2021	10,274,837	6,417,698	62%	3,857,139

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	30	$ 1,185,644	$ 19,882	0.00%
2012	28	1,108,625	$ 19,843	0.00%
2013	27	1,087,126	$ 20,862	0.00%
2014	24	1,005,564	$ 21,136	0.00%
2015	24	1,032,774	$ 26,492	0.00%
2016	20	833,243	$ 26,846	0.00%
2017	16	665,786	$ 23,750	2.00%
2018	15	645,223	$ 25,143	3.00%
2019	13	567,325	$ 28,780	4.00%
2020	13	575,568	$ 30,730	4.00%
2021	13	572,212	$ 28,078	5.00%

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 8-10: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 796,180	$ 604,119	76%	$ 192,061
2012	837,459	650,364	78%	187,095
2013	794,365	697,261	88%	97,104
2014	834,056	744,217	89%	89,839
2015	936,146	785,582	84%	150,564
2016	812,300	821,325	101%	(9,025)
2017	1,363,647	1,116,863	82%	246,784
2018	1,492,551	1,146,044	77%	346,507
2019	1,614,449	1,160,754	72%	453,695
2020	1,784,688	1,242,103	70%	542,585
2021	1,960,835	1,425,130	73%	535,705

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 9-10: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2011	3	$ 145,193	$ 2,055	0.00%
2012	3	147,175	$ 2,060	0.00%
2013	2	77,784	$ 1,039	0.00%
2014	2	79,095	$ 1,065	0.00%
2015	2	84,580	$ 1,544	0.00%
2016	2	83,697	$ 376	0.00%
2017	4	194,550	$ 3,360	0.00%
2018	3	155,616	$ 3,979	0.00%
2019	3	158,262	$ 4,780	0.00%
2020	2	121,048	$ 5,388	0.00%
2021	2	131,803	$ 5,472	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 11 - Sr Adm Emp

Table 8-11: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 2,277,571	$ (106,554)	-5%	$ 2,384,125
2012	2,287,389	(111,496)	-5%	2,398,885
2013	1,993,168	(19,119)	-1%	2,012,287
2014	1,975,333	339,753	17%	1,635,580
2015	2,062,686	752,631	37%	1,310,055
2016	1,965,751	1,129,207	57%	836,544
2017	1,941,839	1,261,323	65%	680,516
2018	1,897,571	1,269,207	67%	628,364
2019	1,518,728	1,316,755	87%	201,973
2020	1,237,683	1,456,067	118%	(218,384)
2021	970,120	1,708,338	176%	(738,218)

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	0	$ 0	$ 24,971	0.00%
2012	0	0	$ 44,496	0.00%
2013	0	0	$ 50,207	0.00%
2014	0	0	$ 12,521	0.00%
2015	0	0	$ 15,584	0.00%
2016	0	0	$ 15,428	5.90%
2017	0	0	$ 15,361	5.90%
2018	0	0	$ 16,965	5.90%
2019	0	0	$ 0	5.90%
2020	0	0	$ 0	5.90%
2021	0	0	$ 0	5.90%

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 - General hired after 7/1/09

Table 8-12: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2011	$ 53,823	$ 26,108	49%	$ 27,715
2012	66,520	34,594	52%	31,926
2013	82,062	45,575	56%	36,487
2014	120,111	59,385	49%	60,726
2015	165,560	82,401	50%	83,159
2016	192,669	112,872	59%	79,797
2017	248,172	158,497	64%	89,675
2018	298,717	218,789	73%	79,928
2019	379,246	279,702	74%	99,544
2020	455,946	340,387	75%	115,559
2021	475,644	404,822	85%	70,822

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	2	$ 42,403	9.45%	5.00%
2012	2	49,457	9.82%	5.00%
2013	2	53,453	10.12%	5.00%
2014	2	69,486	11.35%	5.00%
2015	4	138,036	9.86%	5.00%
2016	5	175,790	9.89%	5.00%
2017	7	223,239	$ 1,764	5.00%
2018	7	269,189	$ 2,075	5.00%
2019	7	293,466	$ 2,486	5.00%
2020	6	248,406	$ 2,285	5.00%
2021	4	169,044	$ 1,522	5.00%

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 8-13: 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	0	0	0%	0
2013	(61)	308	0%	(369)
2014	13,517	8,619	64%	4,898
2015	30,729	19,773	64%	10,956
2016	48,718	36,738	75%	11,980
2017	64,217	54,245	85%	9,972
2018	81,910	75,070	92%	6,840
2019	107,297	104,955	98%	2,342
2020	131,502	143,590	109%	(12,088)
2021	215,168	226,208	105%	(11,040)

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 9-13: 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	0	0	$ 0	0.00%
2013	1	33,235	13.61%	5.00%
2014	1	73,194	13.90%	5.00%
2015	1	75,140	14.53%	5.00%
2016	1	75,145	14.51%	5.00%
2017	1	75,452	14.21%	5.00%
2018	2	121,224	11.26%	5.00%
2019	2	129,555	11.05%	5.00%
2020	3	169,790	14.97%	0.00%
2021	4	218,934	15.30%	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 14 - Gnrl hired on/aftr 9/18/17

Table 8-14: 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	0	0	0%	0
2013	0	0	0%	0
2014	0	0	0%	0
2015	0	0	0%	0
2016	0	0	0%	0
2017	118	633	536%	(515)
2018	12,751	11,602	91%	1,149
2019	38,467	30,531	79%	7,936
2020	78,291	64,014	82%	14,277
2021	141,097	111,356	79%	29,741

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 9-14: 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	0	0	$ 0	0.00%
2013	0	0	$ 0	0.00%
2014	0	0	$ 0	0.00%
2015	0	0	$ 0	0.00%
2016	0	0	$ 0	0.00%
2017	3	82,080	6.67%	5.00%
2018	4	129,751	5.89%	5.00%
2019	6	207,515	6.05%	5.00%
2020	6	246,599	6.24%	5.00%
2021	9	368,111	6.60%	5.00%

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 10: Division-Based Layered Amortization Schedule

Division 01 - General

Table 10-01: Layered Amortization Schedule

				Amounts for Fiscal Year Beginning 10/1/2023		
Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 3,299,117	23	$ 3,493,200	17	$ 283,284
(Gain)/Loss	12/31/2016	127,419	22	144,836	17	11,748
(Gain)/Loss	12/31/2017	(267,039)	21	(301,517)	17	(24,456)
Amendment	12/31/2017	830	21	932	17	72
(Gain)/Loss	12/31/2018	163,539	20	183,833	17	14,904
Amendment	12/31/2018	(446)	20	(510)	17	(36)
(Gain)/Loss	12/31/2019	133,807	19	149,102	17	12,096
Assumption	12/31/2019	293,556	19	301,820	17	24,480
Amendment	12/31/2019	(3,308)	19	(3,685)	17	(300)
Experience	12/31/2020	160,167	18	179,639	17	14,568
Experience	12/31/2021	(362,269)	17	(407,805)	17	(33,072)
Total				**$ 3,739,845**		**$ 303,288**

[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.

Division 10 - NonUnEmp

Table 10-10: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 10/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2017	$ 241,078	15	$ 247,346	11	$ 27,936
(Gain)/Loss	12/31/2018	88,405	15	93,709	12	9,876
(Gain)/Loss	12/31/2019	26,723	15	28,873	13	2,856
Assumption	12/31/2019	58,174	15	60,227	13	5,964
Experience	12/31/2020	83,367	15	92,442	14	8,652
Experience	12/31/2021	(11,455)	15	(12,895)	15	(1,140)
Total				**$ 509,702**		**$ 54,144**

[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 10/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2019	$ (118,956)	10	$ (118,824)	8	$ (17,484)
Experience	12/31/2020	(254,641)	10	(272,459)	9	(36,288)
Experience	12/31/2021	(390,626)	10	(439,727)	10	(53,664)
Total				**$ (831,010)**		**$ (107,436)**

[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.

Division 12 - General hired after 7/1/09

Table 10-12: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 10/1/2023 Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 83,159	23	$ 83,975	17	$ 6,816
(Gain)/Loss	12/31/2016	(3,780)	22	(4,297)	17	(348)
(Gain)/Loss	12/31/2017	10,144	21	11,449	17	924
(Gain)/Loss	12/31/2018	(11,004)	20	(12,366)	17	(1,008)
(Gain)/Loss	12/31/2019	10,961	19	12,213	17	996
Assumption	12/31/2019	8,436	19	8,781	17	708
Experience	12/31/2020	15,232	18	17,082	17	1,380
Experience	12/31/2021	(47,348)	17	(53,300)	17	(4,320)
Total				**$ 63,537**		**$ 5,148**

[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.

Division 13 - Non Union hired after 7/1/09

Table 10-13: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 10/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Experience	12/31/2020	$ (12,531)	15	$ (13,899)	14	$ (1,296)
Experience	12/31/2021	1,220	15	1,373	15	120
Total				**$ (12,526)**		**$ (1,176)**

[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.

Division 14 - Gnrl hired on/aftr 9/18/17

Table 10-14: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 10/1/2023: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2018	$ 1,193	15	$ 1,261	12	$ 132
(Gain)/Loss	12/31/2019	6,187	15	6,681	13	660
Assumption	12/31/2019	539	15	539	13	48
Experience	12/31/2020	5,748	15	6,377	14	600
Experience	12/31/2021	14,633	15	16,472	15	1,464
Total				**$ 31,330**		**$ 2,904**

[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:		44
Inactive employees entitled to but not yet receiving benefits (including refunds):		4
Active employees:		32
		80
Total Pension Liability as of 12/31/2020 measurement date:	$	13,368,481
Total Pension Liability as of 12/31/2021 measurement date:	$	13,707,576
Service Cost for the year ending on the 12/31/2021 measurement date:	$	158,545
Change in the Total Pension Liability due to:		
- Benefit changes[1]:	$	(1,901)
- Differences between expected and actual experience[2]:	$	(313,915)
- Changes in assumptions[2]:	$	441,034
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):	$	1,460,104

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:	$ 1,402,114	$ 0	$ (1,201,235)

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

10/1/2021	Participant Contribution Rate 5%
10/1/2019	Participant Contribution Rate 4%
10/1/2018	Participant Contribution Rate 3%
10/1/2017	Participant Contribution Rate 2%
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Fiscal Month - October
12/1/2012	Exclude Temporary Employees requiring less than 6 months
7/1/1999	Benefit F55 (With 30 Years of Service)
7/1/1997	Benefit B-4 (80% max)
7/1/1995	Benefit B-2
1/1/1989	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1989	10 Year Vesting
1/1/1989	Benefit C-1 (New)
1/1/1989	Member Contribution Rate 0.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

10 - NonUnEmp

12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Fiscal Month - October
12/1/2012	Exclude Temporary Employees requiring less than 6 months
7/1/1999	Benefit F55 (With 30 Years of Service)
1/1/1998	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1998	10 Year Vesting
1/1/1998	Benefit B-4 (80% max)
1/1/1998	Member Contribution Rate 0.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

11 - Sr Adm Emp

12/1/2020	Non-Accelerated Amortization
12/31/2018	Accelerated to 5-year Amortization
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Fiscal Month - October
12/1/2012	Exclude Temporary Employees requiring less than 6 months
9/1/2000	Benefit RS 50 (50% Post-Ret. Spouse Benefits)
10/1/1999	Member Contribution Rate 5.90%
10/1/1999	E2 2.5% COLA for future retirees (10/01/1999)
7/1/1999	Benefit F55 (With 30 Years of Service)
3/1/1998	Benefit FAC-3 (3 Year Final Average Compensation)
3/1/1998	Member Contribution Rate 1.21%
1/1/1998	Benefit FAC-5 (5 Year Final Average Compensation)

11 - Sr Adm Emp

1/1/1998	10 Year Vesting
1/1/1998	Benefit B-4 (80% max)
1/1/1998	Member Contribution Rate 0.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

12 - General hired after 7/1/09

12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Fiscal Month - October
12/1/2012	Exclude Temporary Employees requiring less than 6 months
7/1/2009	Day of work defined as 8 Hours a Day for All employees.
7/1/2009	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/2009	10 Year Vesting
7/1/2009	Benefit B-4 (80% max)
7/1/2009	Benefit F55 (With 30 Years of Service)
7/1/2009	Member Contribution Rate 5.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

13 - Non Union hired after 7/1/09

8/1/2020	Participant Contribution Rate 0%
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Fiscal Month - October
12/1/2012	Exclude Temporary Employees requiring less than 6 months
7/1/2009	Day of work defined as 8 Hours a Day for All employees.
7/1/2009	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/2009	10 Year Vesting
7/1/2009	Benefit B-4 (80% max)
7/1/2009	Benefit F55 (With 30 Years of Service)
7/1/2009	Member Contribution Rate 5.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

14 - Gnrl hired on/aftr 9/18/17

10/1/2017	Day of Work defined as 10 8 hour days
10/1/2017	Benefit FAC-5 (5 Year Final Average Compensation)
10/1/2017	Non Standard Compensation Definition
10/1/2017	Exclude Temporary Employees requiring less than 6 months
10/1/2017	10 Year Vesting
10/1/2017	Defined Benefit Normal Retirement Age - 60
10/1/2017	Service Credit Purchase Estimates - Yes
10/1/2017	Benefit B-2
10/1/2017	Benefit F55 (With 30 Years of Service)
10/1/2017	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
10/1/2017	Participant Contribution Rate 5%
8/1/2014	Fiscal Month - October

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	2.00%

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	7.1	6.9	6.3	5.9
2. Ratio of actuarial accrued liability to payroll	9.6	10.1	9.9	10.0
3. Ratio of actives to retirees and beneficiaries	0.7	0.6	0.7	0.7
4. Ratio of market value of assets to benefit payments	11.1	10.3	10.0	9.2
5. Ratio of net cash flow to market value of assets (boy)	-3.3%	-3.5%	-3.5%	-3.4%

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	32
12	Indicate number of inactive members (excluding pending refunds)	3
13	Indicate number of retirees and beneficiaries	44
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	$9,528,992
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions[5]	$14,242,049
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending September 30, 2022	$547,644

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%.