Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report
December 31, 2020 - Garden City, City of (8255)

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Spring, 2021

Garden City, City of

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 Garden City, City of (8255) as of December 31, 2020. 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. Garden City, City of 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, 2020,
- Establish contribution requirements for the fiscal year beginning July 1, 2022,
- 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, 2020. 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, MERS Retirement Board sets certain assumptions for funding and GASB purposes. These assumptions are checked regularly through a comprehensive study, called an Experience Study. Studies were completed in 2018 and 2020, and are the basis of the economic and demographic assumptions and methods currently in place. Updated economic assumptions were adopted by the MERS Retirement Board at the February 28, 2019 board meeting and were effective with the December 31, 2019 annual actuarial valuation. **At the February 27, 2020 board meeting, the MERS Retirement Board adopted demographic assumptions effective with the December 31, 2020 annual actuarial valuation, which will impact contributions beginning in 2022.**

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:
http://www.mersofmich.com/Portals/0/Assets/Resources/AAV-Appendix/MERS-2020AnnualActuarialValuation-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, 2020. 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 Garden City, City of 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).

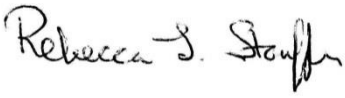
This information is purely actuarial in nature. It is not intended to serve as a substitute for legal, accounting or investment advice.

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.

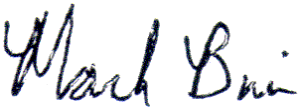
If you have reason to believe that the plan provisions are incorrectly described, that important plan provisions relevant to this valuation are not described, that conditions have changed since the calculations were made, that the information provided in this report is inaccurate or is in anyway incomplete, 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,

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



Rebecca L. Stouffer, ASA, FCA, MAAA



Mark Buis, FSA, FCA, EA, MAAA

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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 funding 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.

	12/31/2020	12/31/2019
Funded Ratio*	55%	57%

* 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, 2020 valuation, the MERS Retirement Board has adopted updated demographic assumptions. Changes to these assumptions are effective for contributions beginning in 2022. Effective with the 2019 valuation, the MERS Retirement Board adopted updated economic assumptions. The combined impact of these assumption changes may be phased in. This valuation reflects the second year of phase-in for the economic assumption update and the first year of phase-in for the demographic assumption update. The remaining combined phase-in period is four 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:	12/31/2020	12/31/2020	12/31/2019	12/31/2019	12/31/2020	12/31/2020	12/31/2019	12/31/2019
Fiscal Year Beginning:	July 1, 2022	July 1, 2022	July 1, 2021	July 1, 2021	July 1, 2022	July 1, 2022	July 1, 2021	July 1, 2021
Division								
01 - GCSPPA & Library	74.25%	81.88%	81.99%	87.54%	$ 88,746	$ 97,866	$ 85,695	$ 91,494
02 - POAM Dispatchers	-	-	-	-	3,829	5,635	2,983	3,676
05 - IAFF Fire	-	-	-	-	45,586	52,444	44,572	48,316
10 - Retirees 1968 - October 1993	-	-	-	-	20,857	21,937	22,229	23,015
20 - POAM Police Offrs & Detective	45.15%	50.65%	52.02%	56.49%	44,162	49,538	47,563	51,649
21 - TPOAM	37.90%	45.70%	37.49%	40.57%	57,445	69,271	55,171	59,701
22 - COAM Command	52.86%	61.67%	59.72%	65.16%	60,161	70,187	54,788	59,780
50 - IAFF after 7/1/2011	2.95%	4.08%	2.82%	2.86%	2,059	2,848	1,681	1,702
Total Municipality - Estimated Monthly Contribution					**$ 322,845**	**$ 369,726**	**$ 314,682**	**$ 339,333**
Total Municipality - Estimated Annual Contribution					**$ 3,874,140**	**$ 4,436,712**	**$ 3,776,184**	**$ 4,071,996**

Employee contribution rates:

	Employee Contribution Rate	
Valuation Date:	12/31/2020	12/31/2019
Division		
01 - GCSPPA & Library	12.00%	12.00%
02 - POAM Dispatchers	12.00%	12.00%
05 - IAFF Fire	12.00%	12.00%
10 - Retirees 1968 - October 1993	0.00%	0.00%
20 - POAM Police Offrs & Detective	12.00%	12.00%
21 - TPOAM	12.00%	12.00%
22 - COAM Command	12.00%	12.00%
50 - IAFF after 7/1/2011	12.00%	12.00%

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.

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 2022 for the entire employer would be $573,708, instead of $369,726.

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 **7.35%** 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 Change in 2020

A 5-year experience study analyzing historical experience from 2013 through 2018 was completed in February 2020. In addition to changes to the economic assumptions which took effect with the fiscal year 2021 contribution rates, the experience study recommended updated demographic assumptions, including adjustments to the following actuarial assumptions: mortality, retirement, disability, and termination rates. Changes to the demographic assumptions resulting from the experience study have been approved by the MERS Retirement Board and are effective beginning with the December 31, 2020 actuarial valuation, first impacting 2022 contributions. A complete description of the assumptions may be found in the Appendix to the valuation.

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. 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 2020 was 8.17%, while the actual market rate of return was 12.70%.** 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, 2020, the actuarial value of assets is 97% of market value due to asset smoothing. This means that the 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 exceed the 7.35% 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).

If the December 31, 2020 valuation results were based on market value instead of actuarial value:

- The funded percent of your entire municipality would be 56% (instead of 55%); and
- Your total employer contribution requirement for the fiscal year starting July 1, 2022 would be $4,306,488 (instead of $4,436,712).

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 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, 2020 valuation, and are for the municipality in total, not by division. These results do not reflect a phase-in of the impact of the new actuarial assumptions.

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.

12/31/2020 Valuation Results	Lower Future Annual Returns	Lower Future Annual Returns	Valuation Assumptions
Investment Return Assumption	**5.35%**	**6.35%**	**7.35%**
Accrued Liability	$ 140,956,866	$ 123,879,508	$ 109,986,184
Valuation Assets[1]	$ 60,369,177	$ 60,369,177	$ 60,369,177
Unfunded Accrued Liability	$ 80,587,689	$ 63,510,331	$ 49,617,007
Funded Ratio	43%	49%	55%
Monthly Normal Cost	$ 128,838	$ 84,516	$ 51,997
Monthly Amortization Payment	$ 455,514	$ 384,100	$ 317,729
Total Employer Contribution[2]	$ 584,352	$ 468,616	$ 369,726

[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

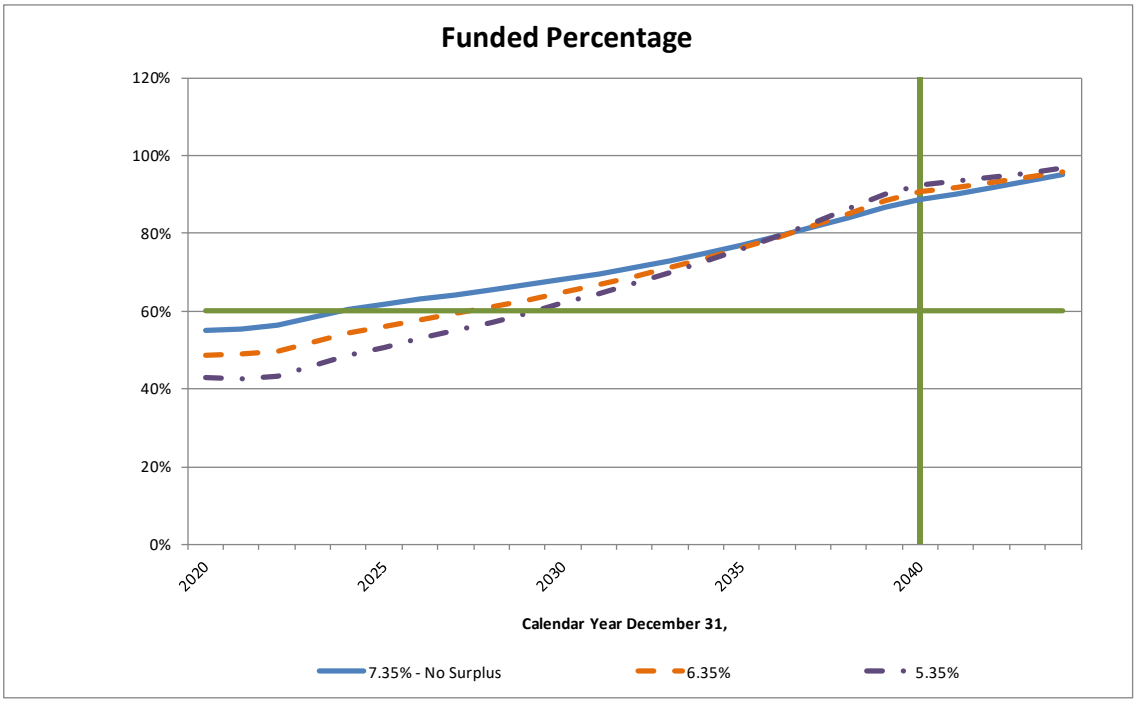
The next two pages show projections of the plan's funded ratio and computed employer contributions under the actuarial assumptions used in the valuation and alternate economic assumption scenarios. All three projections take into account the past investment experience that will continue to affect the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

The 7.35% scenario provides an estimate of computed employer contributions based on current actuarial assumptions, and a projected 7.35% 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 6.35% and 5.35% projection scenarios provide an indication of the potential required employer contribution if these assumptions were met over the long-term.

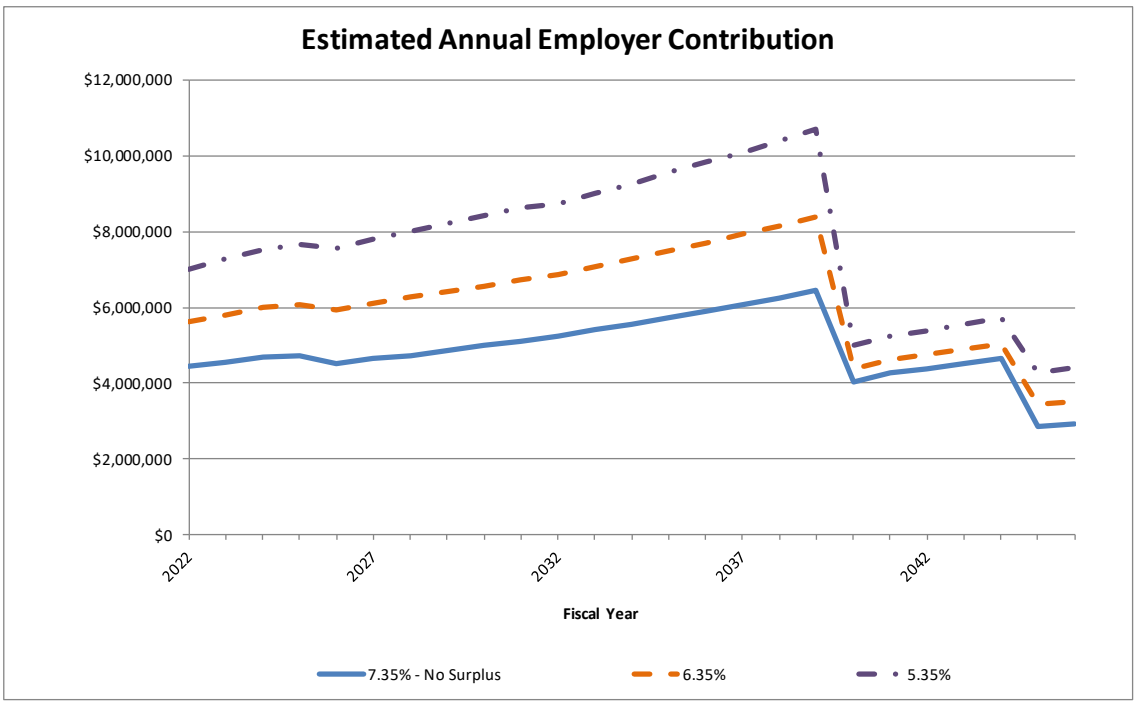
Valuation Year Ending 12/31	Fiscal Year Beginning 7/1	Actuarial Accrued Liability	Valuation Assets[2]	Funded Percentage	Estimated Annual Employer Contribution
7.35%[1] - NO PHASE-IN					
2020	2022	$ 109,986,184	$ 60,369,177	55%	$ 4,436,712
2021	2023	$ 112,600,000	$ 62,500,000	55%	$ 4,550,000
2022	2024	$ 115,400,000	$ 65,000,000	56%	$ 4,690,000
2023	2025	$ 117,900,000	$ 69,000,000	59%	$ 4,720,000
2024	2026	$ 120,400,000	$ 72,800,000	60%	$ 4,520,000
2025	2027	$ 122,800,000	$ 75,900,000	62%	$ 4,650,000
6.35%[1] - NO PHASE-IN					
2020	2022	$ 123,879,508	$ 60,369,177	49%	$ 5,623,392
2021	2023	$ 126,700,000	$ 61,900,000	49%	$ 5,800,000
2022	2024	$ 129,700,000	$ 64,400,000	50%	$ 6,000,000
2023	2025	$ 132,400,000	$ 68,900,000	52%	$ 6,070,000
2024	2026	$ 135,100,000	$ 73,300,000	54%	$ 5,930,000
2025	2027	$ 137,600,000	$ 77,100,000	56%	$ 6,100,000
5.35%[1] - NO PHASE-IN					
2020	2022	$ 140,956,866	$ 60,369,177	43%	$ 7,012,224
2021	2023	$ 144,000,000	$ 61,300,000	43%	$ 7,270,000
2022	2024	$ 147,200,000	$ 63,800,000	43%	$ 7,540,000
2023	2025	$ 150,200,000	$ 69,200,000	46%	$ 7,660,000
2024	2026	$ 153,100,000	$ 74,400,000	49%	$ 7,570,000
2025	2027	$ 155,800,000	$ 79,100,000	51%	$ 7,790,000

[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 20 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 July 1, 2022

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 - GCSPPA & Library	19.90%	12.00%	7.90%	73.98%	81.88%	74.25%			0.75%
02 - POAM Dispatchers	0.00%	12.00%	-	-	-	-			
05 - IAFF Fire	20.67%	12.00%	-	-	-	-	38.48%	33.16%	
10 - Retirees 1968 - October 1993	0.00%	0.00%	-	-	-	-			
20 - POAM Police Offrs & Detective	21.10%	12.00%	9.10%	41.55%	50.65%	45.15%			0.87%
21 - TPOAM	20.51%	12.00%	8.51%	37.19%	45.70%	37.90%			0.74%
22 - COAM Command	21.97%	12.00%	9.97%	51.70%	61.67%	52.86%			0.76%
50 - IAFF after 7/1/2011	16.30%	12.00%	4.30%	-0.22%	4.08%	2.95%	38.48%	33.16%	0.85%
Estimated Monthly Contribution[3]									
01 - GCSPPA & Library			$ 9,442	$ 88,424	$ 97,866	$ 88,746			
02 - POAM Dispatchers			0	5,635	5,635	3,829			
05 - IAFF Fire			6,407	46,037	52,444	45,586			
10 - Retirees 1968 - October 1993			0	21,937	21,937	20,857			
20 - POAM Police Offrs & Detective			8,900	40,638	49,538	44,162			
21 - TPOAM			12,900	56,371	69,271	57,445			
22 - COAM Command			11,347	58,840	70,187	60,161			
50 - IAFF after 7/1/2011			3,001	(153)	2,848	2,059			
Total Municipality			**$ 51,997**	**$ 317,729**	**$ 369,726**	**$ 322,845**			
Estimated Annual Contribution[3]			**$ 623,964**	**$ 3,812,748**	**$ 4,436,712**	**$ 3,874,140**			

[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 to not 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 - GCSPPA & Library: Open Division

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.00% (Compound)	2.00% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2.00% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

02 - POAM Dispatchers: Closed to new hires

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	4 years	4 years
COLA for Future Retirees:	2.00% (Compound)	2.00% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2.00% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

05 - IAFF Fire: Closed to new hires, linked to Division 50

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)
Normal Retirement Age:	55	55
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.00% (Compound)	2.00% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2.00% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

10 - Retirees 1968 - October 1993: Closed to new hires

	2020 Valuation	2019 Valuation
Benefit Multiplier:	Old Plan Benefits	Old Plan Benefits
Normal Retirement Age:	-	-
Vesting:	-	-
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	-	-
Final Average Compensation:	-	-
COLA for Current Retirees:	2.00% (Non-Compound)	2.00% (Non-Compound)
Employee Contributions:	-	-
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

20 - POAM Police Offrs & Detective: Open Division

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)
Normal Retirement Age:	55	55
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.00% (Compound)	2.00% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2.00% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

21 - TPOAM: Open Division

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.57% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)	2.57% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.00% (Compound)	2.00% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2.00% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

22 - COAM Command: Open Division

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)	2.50% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (no max)
Normal Retirement Age:	55	55
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.00% (Compound)	2.00% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2.00% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) SLIF (30 Days) Non-Duty Death/Disability Eligibility: 1 year Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

50 - IAFF after 7/1/2011: Open Division, linked to Division 05

	2020 Valuation	2019 Valuation
Benefit Multiplier:	2.00% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (55% max)	2.00% Multiplier for Svc < 25 yrs, 1.00% Multiplier for Svc > 25 yrs (55% max)
Normal Retirement Age:	55	55
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 & Out	25 & Out
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.00% (Non-Compound)	2.00% (Non-Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate)	D2 (67%) Annuity Withdrawal (Treasury Bill Rate)
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

Table 3: Participant Summary

Division	2020 Valuation Number	2020 Valuation Annual Payroll[1]	2019 Valuation Number	2019 Valuation Annual Payroll[1]	2020 Valuation Average Age	2020 Valuation Average Benefit Service[2]	2020 Valuation Average Eligibility Service[2]
01 - GCSPPA & Library							
Active Employees	19	$ 1,331,961	18	$ 1,164,787	44.0	9.0	11.2
Vested Former Employees	3	33,867	2	32,403	52.3	5.9	14.4
Retirees and Beneficiaries	38	1,584,743	37	1,497,337	65.8		
Pending Refunds	7		8				
02 - POAM Dispatchers							
Active Employees	0	$ 0	0	$ 0	0.0	0.0	0.0
Vested Former Employees	1	11,200	1	11,200	53.9	9.5	18.5
Retirees and Beneficiaries	7	175,028	7	171,596	66.7		
Pending Refunds	1		1				
05 - IAFF Fire							
Active Employees	13	$ 1,082,529	14	$ 1,083,041	45.7	17.5	17.6
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	18	838,104	17	780,277	67.4		
Pending Refunds	0		0				
10 - Retirees 1968 - October 1993							
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	26	519,494	31	586,411	80.5		
Pending Refunds	0		0				
20 - POAM Police Offrs & Detective							
Active Employees	20	$ 1,089,866	21	$ 1,018,823	29.5	3.6	4.1
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	28	1,027,673	28	1,003,939	60.3		
Pending Refunds	7		6				
21 - TPOAM							
Active Employees	32	$ 1,689,227	33	$ 1,639,766	44.8	13.2	13.5
Vested Former Employees	2	19,766	2	19,800	51.3	9.1	13.7
Retirees and Beneficiaries	42	1,110,938	41	1,049,096	66.1		
Pending Refunds	0		0				
22 - COAM Command							
Active Employees	14	$ 1,268,287	12	$ 1,022,363	47.9	18.9	20.7
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	21	988,431	21	963,736	62.7		
Pending Refunds	1		1				

Table 3 (continued)

Division	2020 Valuation Number	2020 Valuation Annual Payroll[1]	2019 Valuation Number	2019 Valuation Annual Payroll[1]	2020 Valuation Average Age	2020 Valuation Average Benefit Service[2]	2020 Valuation Average Eligibility Service[2]
50 - IAFF after 7/1/2011							
Active Employees	8	$ 518,727	8	$ 442,765	32.4	2.8	2.8
Vested Former Employees	1	6,726	1	6,726	35.6	5.1	7.1
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	3		3				
Total Municipality							
Active Employees	**106**	**$ 6,980,597**	**106**	**$ 6,371,545**	**41.4**	**11.1**	**12.0**
Vested Former Employees	**7**	**71,559**	**6**	**70,128**	**49.9**	**7.2**	**13.7**
Retirees and Beneficiaries	**180**	**6,244,411**	**182**	**6,052,391**	**67.0**		
Pending Refunds	**19**		**19**				
Total Participants	**312**		**313**				

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	2020 Valuation		2019 Valuation	
	Employer and Retiree[1]	Employee[2]	Employer and Retiree[1]	Employee[2]
01 - GCSPPA & Library	$ 10,031,914	$ 1,190,468	$ 9,344,295	$ 1,140,374
02 - POAM Dispatchers	1,905,986	39,759	1,844,631	39,719
05 - IAFF Fire	8,862,991	1,042,498	8,153,450	1,003,614
10 - Retirees 1968 - October 1993	2,388,171	0	2,498,885	0
20 - POAM Police Offrs & Detective	8,589,488	648,749	8,234,957	387,753
21 - TPOAM	11,605,965	1,834,231	10,566,330	1,792,232
22 - COAM Command	11,922,280	1,701,999	10,742,690	1,514,646
50 - IAFF after 7/1/2011	141,990	178,918	65,604	116,554
Municipality Total[3]	**$ 55,448,784**	**$ 6,636,622**	**$ 51,450,842**	**$ 5,994,892**
Combined Assets[3]	**$62,085,405**		**$57,445,734**	

1 Reserve for Employer Contributions and Benefit Payments.

2 Reserve for Employee Contributions.

3 Totals may not add due to rounding.

The December 31, 2020 valuation assets (actuarial value of assets) are equal to 0.972357 times the reported market value of assets (compared to 1.013179 as of December 31, 2019). 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		Employee Contributions	Investment Income (Valuation Assets)	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
	Required	Additional						
2010	$ 43,368,815		$ 3,547,003	$ 9,488,697	$ (356,199)	$ 0	$ 0	$ 56,048,316
2011	3,665,897	$ 72	538,625	3,090,628	(4,396,546)	(230,474)	117,730	58,834,248
2012	1,127,654	6,765	325,381	2,333,361	(4,551,498)	(72,950)	0	58,002,961
2013	1,419,961	0	328,243	3,266,712	(4,671,094)	(91,000)	353,305	58,609,088
2014	1,564,554	10,679	466,204	3,243,591	(4,711,929)	(345,830)	358,513	59,194,870
2015	1,664,546	7,132	637,410	2,809,683	(4,796,619)	(128,617)	67,475	59,455,880
2016	1,783,049	180	645,441	2,892,278	(4,968,667)	(540,158)	182,702	59,450,705
2017	1,935,510	327	649,562	3,425,949	(5,326,117)	(598,790)	141,377	59,678,523
2018	2,193,823	0	730,484	2,112,546	(5,597,930)	(498,160)	204,153	58,823,439
2019	2,575,802	8,416	785,288	2,619,403	(5,927,181)	(841,537)	159,182	58,202,812
2020	2,996,705	570	838,524	4,496,984	(6,093,346)	(301,361)	228,289	60,369,177

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.

Additional employer contributions, if any, are shown separately starting in 2011. Prior to 2011, additional contributions are combined with the required employer contributions.

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, 2020

Division	Actuarial Accrued Liability					Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
	Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total			
01 - GCSPPA & Library	$ 3,921,399	$ 197,965	$ 21,002,018	$ 134,139	$ 25,255,521	$ 10,912,162	43.2%	$ 14,343,359
02 - POAM Dispatchers	0	103,978	2,263,661	15,747	2,383,386	1,891,958	79.4%	491,428
05 - IAFF Fire	6,132,566	0	10,996,050	0	17,128,616	9,631,671	56.2%	7,496,945
10 - Retirees 1968 - October 1993	0	0	3,645,561	0	3,645,561	2,322,154	63.7%	1,323,407
20 - POAM Police Offrs & Detective	972,727	0	15,124,428	20,839	16,117,994	8,982,864	55.7%	7,135,130
21 - TPOAM	7,636,670	214,126	14,629,420	0	22,480,216	13,068,668	58.1%	9,411,548
22 - COAM Command	8,253,866	0	14,371,430	45,601	22,670,897	13,247,663	58.4%	9,423,234
50 - IAFF after 7/1/2011	269,008	22,779	0	12,206	303,993	312,037	102.6%	(8,044)
Total	**$ 27,186,236**	**$ 538,848**	**$ 82,032,568**	**$ 228,532**	**$ 109,986,184**	**$ 60,369,177**	**54.9%**	**$ 49,617,007**

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 50, 05	$ 6,401,574	$ 22,779	$ 10,996,050	$ 12,206	$ 17,432,609	$ 9,943,708	57.0%	$ 7,488,901

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

The December 31, 2020 valuation assets (actuarial value of assets) are equal to 0.972357 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
2006	$ 0	$ 0	0%	$ 0
2007	0	0	0%	0
2008	0	0	0%	0
2009	0	0	0%	0
2010	71,516,007	56,048,316	78%	15,467,691
2011	73,458,694	58,834,248	80%	14,624,446
2012	75,208,679	58,002,961	77%	17,205,718
2013	78,147,714	58,609,088	75%	19,538,626
2014	80,102,261	59,194,870	74%	20,907,391
2015	86,688,222	59,455,880	69%	27,232,342
2016	90,160,892	59,450,705	66%	30,710,187
2017	92,566,698	59,678,523	65%	32,888,175
2018	95,427,991	58,823,439	62%	36,604,552
2019	101,324,279	58,202,812	57%	43,121,467
2020	109,986,184	60,369,177	55%	49,617,007

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012, 2015, 2019 and 2020 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 - GCSPPA & Library

Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 16,197,427	$ 10,866,913	67%	$ 5,330,514
2011	16,728,916	11,070,673	66%	5,658,243
2012	17,172,612	10,928,522	64%	6,244,090
2013	17,775,095	10,716,583	60%	7,058,512
2014	17,811,435	10,705,038	60%	7,106,397
2015	19,185,787	10,644,681	56%	8,541,106
2016	19,939,028	10,584,291	53%	9,354,737
2017	21,376,767	11,180,620	52%	10,196,147
2018	22,379,947	10,751,981	48%	11,627,966
2019	23,306,781	10,622,846	46%	12,683,935
2020	25,255,521	10,912,162	43%	14,343,359

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

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		
2010	16	$ 1,102,659	37.86%	6.00%
2011	17	1,087,889	40.14%	6.00%
2012	16	1,048,745	47.57%	6.00%
2013	16	1,067,810	51.06%	6.00%
2014	17	1,119,037	43.64%	12.00%
2015	17	1,121,753	54.86%	12.00%
2016	18	1,202,743	56.83%	12.00%
2017	18	1,189,107	63.23%	12.00%
2018	16	1,018,017	84.65%	12.00%
2019	18	1,164,787	87.54%	12.00%
2020	19	1,331,961	81.88%	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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 8-02: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 2,532,357	$ 2,243,068	89%	$ 289,289
2011	2,279,416	2,570,290	113%	(290,874)
2012	2,296,320	2,471,927	108%	(175,607)
2013	2,339,298	2,458,341	105%	(119,043)
2014	2,246,183	2,454,753	109%	(208,570)
2015	2,412,634	2,427,807	101%	(15,173)
2016	2,124,302	2,105,750	99%	18,552
2017	2,144,050	2,074,906	97%	69,144
2018	2,147,527	1,985,001	92%	162,526
2019	2,232,145	1,909,184	86%	322,961
2020	2,383,386	1,891,958	79%	491,428

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

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		
2010	6	$ 280,919	15.81%	6.00%
2011	1	46,945	0.00%	6.00%
2012	1	45,285	0.00%	6.00%
2013	1	45,320	0.00%	6.00%
2014	1	45,355	0.00%	12.00%
2015	1	45,390	4.49%	12.00%
2016	0	0	$ 227	12.00%
2017	0	0	$ 788	12.00%
2018	0	0	$ 1,827	12.00%
2019	0	0	$ 3,676	12.00%
2020	0	0	$ 5,635	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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 8-05: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 10,297,127	$ 7,505,921	73%	$ 2,791,206
2011	10,619,352	8,064,611	76%	2,554,741
2012	11,050,371	8,140,579	74%	2,909,792
2013	11,483,822	8,351,357	73%	3,132,465
2014	12,109,610	8,450,023	70%	3,659,587
2015	13,390,734	8,579,606	64%	4,811,128
2016	13,780,290	8,748,599	64%	5,031,691
2017	14,163,317	9,030,604	64%	5,132,713
2018	14,586,537	9,011,907	62%	5,574,630
2019	15,761,477	9,277,744	59%	6,483,733
2020	17,128,616	9,631,671	56%	7,496,945

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

Table 9-05: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2010	14	$ 1,021,788	27.74%	5.00%
2011	14	1,027,187	26.35%	5.00%
2012	14	1,043,475	29.63%	5.00%
2013	14	1,040,746	$ 27,115	5.00%
2014	13	967,890	$ 30,221	5.00%
2015	13	975,268	$ 39,041	5.00%
2016	13	977,958	$ 39,713	5.00%
2017	13	971,843	$ 39,781	5.00%
2018	12	894,149	$ 38,864	12.00%
2019	14	1,083,041	$ 48,316	12.00%
2020	13	1,082,529	$ 52,444	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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
2010	$ 6,699,244	$ 6,449,210	96%	$ 250,034
2011	6,506,590	6,098,682	94%	407,908
2012	6,262,204	5,454,326	87%	807,878
2013	5,825,408	4,933,836	85%	891,572
2014	5,282,310	4,528,316	86%	753,994
2015	5,070,647	4,095,488	81%	975,159
2016	4,831,307	3,677,981	76%	1,153,326
2017	4,569,014	3,294,370	72%	1,274,644
2018	4,318,994	2,880,504	67%	1,438,490
2019	4,089,716	2,531,818	62%	1,557,898
2020	3,645,561	2,322,154	64%	1,323,407

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

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		
2010	0	$ 0	$ 1,350	0.00%
2011	0	0	$ 2,430	0.00%
2012	0	0	$ 5,236	0.00%
2013	0	0	$ 6,020	0.00%
2014	0	0	$ 5,305	0.00%
2015	0	0	$ 8,146	0.00%
2016	0	0	$ 10,887	0.00%
2017	0	0	$ 13,645	0.00%
2018	0	0	$ 17,804	0.00%
2019	0	0	$ 23,015	0.00%
2020	0	0	$ 21,937	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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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
2010	$ 11,047,590	$ 8,379,531	76%	$ 2,668,059
2011	11,202,219	8,664,262	77%	2,537,957
2012	11,534,729	8,841,234	77%	2,693,495
2013	12,527,338	9,504,801	76%	3,022,537
2014	13,500,783	10,198,758	76%	3,302,025
2015	15,081,600	10,511,068	70%	4,570,532
2016	15,628,122	10,420,526	67%	5,207,596
2017	16,569,384	10,431,393	63%	6,137,991
2018	15,325,326	9,472,698	62%	5,852,628
2019	15,527,795	8,736,349	56%	6,791,446
2020	16,117,994	8,982,864	56%	7,135,130

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

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		
2010	22	$ 1,459,368	22.43%	6.00%
2011	19	1,277,559	23.78%	6.00%
2012	19	1,281,640	25.44%	6.00%
2013	20	1,359,059	26.56%	6.00%
2014	21	1,397,792	22.54%	12.00%
2015	20	1,363,141	30.21%	12.00%
2016	18	1,206,007	36.43%	12.00%
2017	22	1,292,529	39.92%	12.00%
2018	19	936,484	50.36%	12.00%
2019	21	1,018,823	56.49%	12.00%
2020	20	1,089,866	50.65%	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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 8-21: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 13,436,366	$ 11,043,708	82%	$ 2,392,658
2011	13,610,256	11,844,379	87%	1,765,877
2012	14,089,764	11,803,992	84%	2,285,772
2013	15,107,187	12,164,723	81%	2,942,464
2014	15,586,787	12,266,375	79%	3,320,412
2015	17,337,313	12,459,094	72%	4,878,219
2016	18,520,246	12,833,678	69%	5,686,568
2017	18,248,827	12,362,759	68%	5,886,068
2018	19,057,895	12,493,123	66%	6,564,772
2019	20,099,836	12,521,436	62%	7,578,400
2020	22,480,216	13,068,668	58%	9,411,548

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

Table 9-21: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2010	37	$ 1,698,964	18.58%	6.00%
2011	30	1,447,982	17.72%	6.00%
2012	30	1,430,692	20.81%	6.00%
2013	29	1,418,324	23.71%	6.00%
2014	30	1,454,121	19.27%	12.00%
2015	31	1,514,671	27.15%	12.00%
2016	33	1,592,627	29.83%	12.00%
2017	32	1,507,265	32.18%	12.00%
2018	32	1,562,201	35.16%	12.00%
2019	33	1,639,766	40.57%	12.00%
2020	32	1,689,227	45.70%	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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 8-22: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 11,305,896	$ 9,559,965	85%	$ 1,745,931
2011	12,511,945	10,521,351	84%	1,990,594
2012	12,802,679	10,362,381	81%	2,440,298
2013	13,088,867	10,477,417	80%	2,611,450
2014	13,530,889	10,556,719	78%	2,974,170
2015	14,121,278	10,657,231	76%	3,464,047
2016	15,194,570	10,947,339	72%	4,247,231
2017	15,296,025	11,100,771	73%	4,195,254
2018	17,339,284	11,944,476	69%	5,394,808
2019	20,130,655	12,418,876	62%	7,711,779
2020	22,670,897	13,247,663	58%	9,423,234

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

Table 9-22: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2010	6	$ 471,784	32.85%	6.00%
2011	8	635,567	29.52%	6.00%
2012	8	645,191	35.49%	6.00%
2013	8	647,215	36.65%	6.00%
2014	8	654,319	34.19%	12.00%
2015	8	654,266	40.71%	12.00%
2016	8	645,186	50.04%	12.00%
2017	8	657,110	49.39%	12.00%
2018	12	987,428	45.39%	12.00%
2019	12	1,022,363	65.16%	12.00%
2020	14	1,268,287	61.67%	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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 8-50: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 0	$ 0	0%	$ 0
2011	0	0	0%	0
2012	0	0	0%	0
2013	699	2,030	290%	(1,331)
2014	34,264	34,888	102%	(624)
2015	88,229	80,905	92%	7,324
2016	143,027	132,541	93%	10,486
2017	199,314	203,100	102%	(3,786)
2018	272,481	283,749	104%	(11,268)
2019	175,874	184,559	105%	(8,685)
2020	303,993	312,037	103%	(8,044)

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

Table 9-50: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2010	0	$ 0	$ 0	0.00%
2011	0	0	$ 0	0.00%
2012	0	0	$ 0	0.00%
2013	3	103,822	8.06%	6.00%
2014	5	241,905	7.41%	6.00%
2015	5	288,231	8.02%	6.00%
2016	5	303,379	8.03%	6.00%
2017	7	397,863	8.00%	6.00%
2018	10	529,820	2.87%	12.00%
2019	8	442,765	2.86%	12.00%
2020	8	518,727	4.08%	12.00%

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 for the 12/31/2015 through 12/31/2020 valuations do not reflect the phase-in of the change in contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above.

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 - GCSPPA & Library

Table 10-01: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 8,541,106	23	$ 9,157,643	23	$ 626,256
(Gain)/Loss	12/31/2016	629,178	22	708,582	18	56,652
(Gain)/Loss	12/31/2017	655,969	21	733,848	18	58,668
(Gain)/Loss	12/31/2018	1,277,864	20	1,423,106	18	113,772
(Gain)/Loss	12/31/2019	18,540	19	20,483	18	1,632
Assumption	12/31/2019	855,743	19	876,074	18	70,032
Experience	12/31/2020	1,507,922	18	1,677,189	18	134,076
Total				**$ 14,596,925**		**$ 1,061,088**

[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.

Note:

Based on the results of a study as required by the Actuarial Policy this division adopted to extend the amortization period, as allowed by the MERS Board.

The unfunded accrued liability (UAL) as of December 31, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2016	$ 19,869	10	$ 16,498	6	$ 3,156
(Gain)/Loss	12/31/2017	48,473	10	44,464	7	7,428
(Gain)/Loss	12/31/2018	88,618	10	87,958	8	13,104
(Gain)/Loss	12/31/2019	75,369	10	79,221	9	10,704
Assumption	12/31/2019	79,150	10	81,831	9	11,052
Experience	12/31/2020	160,878	10	178,937	10	22,176
Total				**$ 488,909**		**$ 67,620**

[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, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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 10-05: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 4,811,128	23	$ 5,231,129	23	$ 357,732
(Gain)/Loss	12/31/2016	62,826	22	70,758	18	5,652
(Gain)/Loss	12/31/2017	2,067	21	2,306	18	180
(Gain)/Loss	12/31/2018	323,628	20	360,409	18	28,812
Amendment	12/31/2018	72,939	20	81,228	18	6,492
(Gain)/Loss	12/31/2019	259,930	19	287,252	18	22,968
Assumption	12/31/2019	590,671	19	618,042	18	49,404
Experience	12/31/2020	913,223	18	1,015,734	18	81,204
Total				**$ 7,666,858**		**$ 552,444**

[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.

Note:

Based on the results of a study as required by the Actuarial Policy this division adopted to extend the amortization period, as allowed by the MERS Board.

The unfunded accrued liability (UAL) as of December 31, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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 10-10: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 975,159	13	$ 659,102	4	$ 181,416
(Gain)/Loss	12/31/2016	173,288	11	132,983	4	36,600
(Gain)/Loss	12/31/2017	115,459	10	105,919	7	17,688
(Gain)/Loss	12/31/2018	182,419	10	181,047	8	26,976
(Gain)/Loss	12/31/2019	73,891	10	77,668	9	10,488
Assumption	12/31/2019	86,959	10	83,540	9	11,280
Experience	12/31/2020	(153,899)	10	(171,174)	10	(21,204)
Total				**$ 1,069,085**		**$ 263,244**

[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, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 4,570,532	23	$ 5,018,753	28	$ 307,116
(Gain)/Loss	12/31/2016	523,250	22	589,283	18	47,112
(Gain)/Loss	12/31/2017	781,095	21	873,808	18	69,852
(Gain)/Loss	12/31/2018	(410,238)	20	(456,863)	18	(36,528)
(Gain)/Loss	12/31/2019	257,784	19	284,876	18	22,776
Assumption	12/31/2019	649,808	19	682,078	18	54,528
Experience	12/31/2020	256,470	18	285,259	18	22,800
Total				**$ 7,277,194**		**$ 487,656**

[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.

Note:

Based on the results of a study as required by the Actuarial Policy this division adopted to extend the amortization period, as allowed by the MERS Board.

The unfunded accrued liability (UAL) as of December 31, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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 10-21: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 4,878,219	23	$ 5,364,274	28	$ 328,248
(Gain)/Loss	12/31/2016	670,286	22	754,877	18	60,348
(Gain)/Loss	12/31/2017	40,256	21	45,028	18	3,600
(Gain)/Loss	12/31/2018	602,288	20	670,751	18	53,628
(Gain)/Loss	12/31/2019	206,668	19	228,395	18	18,264
Assumption	12/31/2019	726,390	19	762,375	18	60,948
Experience	12/31/2020	1,702,830	18	1,893,975	18	151,416
Total				**$ 9,719,675**		**$ 676,452**

[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.

Note:

Based on the results of a study as required by the Actuarial Policy this division adopted to extend the amortization period, as allowed by the MERS Board.

The unfunded accrued liability (UAL) as of December 31, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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 10-22: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 3,464,047	23	$ 3,759,327	28	$ 230,040
(Gain)/Loss	12/31/2016	715,298	22	805,567	18	64,404
(Gain)/Loss	12/31/2017	(166,093)	21	(185,806)	18	(14,856)
(Gain)/Loss	12/31/2018	1,150,065	20	1,280,790	18	102,396
(Gain)/Loss	12/31/2019	1,423,401	19	1,573,022	18	125,748
Assumption	12/31/2019	794,700	19	836,995	18	66,912
Experience	12/31/2020	1,478,174	18	1,644,102	18	131,436
Total				**$ 9,713,997**		**$ 706,080**

[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.

Note:

Based on the results of a study as required by the Actuarial Policy this division adopted to extend the amortization period, as allowed by the MERS Board.

The unfunded accrued liability (UAL) as of December 31, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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 10-50: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 7/1/2022		
				Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2017	$ (4,853)	15	$ (5,079)	12	$ (540)
(Gain)/Loss	12/31/2018	18,468	15	19,832	13	2,004
Amendment	12/31/2018	(24,907)	10	(24,719)	8	(3,684)
(Gain)/Loss	12/31/2019	2,755	15	3,003	14	288
Assumption	12/31/2019	903	15	1,038	14	96
Experience	12/31/2020	(31)	15	(35)	15	0
Total				**$ (5,960)**		**$ (1,836)**

[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, 2020 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2020 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:	12/31/2020
Measurement Date of the Total Pension Liability (TPL):	12/31/2020
At 12/31/2020, the following employees were covered by the benefit terms:	
Inactive employees or beneficiaries currently receiving benefits:	180
Inactive employees entitled to but not yet receiving benefits (including refunds):	26
Active employees:	106
	312

Total Pension Liability as of 12/31/2019 measurement date:	$ 98,612,194
Total Pension Liability as of 12/31/2020 measurement date:	$ 106,919,715
Service Cost for the year ending on the 12/31/2020 measurement date:	$ 1,305,579
Change in the Total Pension Liability due to:	
- Benefit changes[1]:	$ 0
- Differences between expected and actual experience[2]:	$ 1,605,712
- Changes in assumptions[2]:	$ 4,489,796
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):	$ 6,980,597

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 (6.60%)	Current Discount Rate (7.60%)	1% Increase (8.60%)
Change in Net Pension Liability as of 12/31/2020:	$ 13,220,183	$ 0	$ (10,912,952)

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 - GCSPPA & Library

6/2/2020	Extended Amortization to 25 yrs (based off 2018 AAV)
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Member Contribution Rate 12.00%
1/1/2012	E2 2% Comp COLA for future retirees (01/01/2012)
1/1/2012	E1 2% Comp COLA for past retirees (12/31/2011)
1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	10 Year Vesting
7/1/2010	2.50% Mult. for Svc < 25 yrs , 1% for Svc>25 yrs (no max)
7/1/2010	Member Contribution Rate 6.00%
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

02 - POAM Dispatchers

12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Member Contribution Rate 12.00%
1/1/2012	E1 2% Comp COLA for past retirees (12/31/2011)
1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-4 (4 Year Final Average Compensation)
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	10 Year Vesting
7/1/2010	2.50% Mult. for Svc < 25 yrs , 1% for Svc>25 yrs (no max)
7/1/2010	Member Contribution Rate 6.00%

02 - POAM Dispatchers

7/1/2010	E2 2% Comp COLA for future retirees (01/01/2010)
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

05 - IAFF Fire

6/2/2020	Extended Amortization to 25 yrs (based off 2018 AAV)
3/1/2018	Participant Contribution Rate 12%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2012	E2 2% Comp COLA for future retirees (01/01/2012)
1/1/2012	E1 2% Comp COLA for past retirees (12/31/2011)
1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	10 Year Vesting
7/1/2010	2.50% Mult. for Svc < 25 yrs , 1% for Svc>25 yrs (no max)
7/1/2010	Benefit F55 (With 10 Years of Service)
7/1/2010	Member Contribution Rate 5.00%
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

10 - Retirees 1968 - October 1993

12/1/2020	Non-Accelerated Amortization
12/31/2018	Accelerated to 5-year Amortization
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2011	E1 2% COLA for past retirees (07/01/2010)
7/1/2010	Annuity Withdrawal - MERS Rate
7/1/2010	Day of work defined as 80 Hours a Month for Group employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	10 Year Vesting
7/1/2010	2.5% Multiplier (no max)
7/1/2010	Member Contribution Rate 0.00%
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

20 - POAM Police Offrs & Detective

6/2/2020	Extended Amortization to 30 yrs (based off 2018 AAV)
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Member Contribution Rate 12.00%
1/1/2012	E1 2% Comp COLA for past retirees (12/31/2011)
1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	10 Year Vesting
7/1/2010	2.50% Mult. for Svc < 25 yrs , 1% for Svc>25 yrs (no max)
7/1/2010	Benefit F55 (With 10 Years of Service)
7/1/2010	Member Contribution Rate 6.00%
7/1/2010	E2 2% Comp COLA for future retirees (01/01/2010)
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

21 - TPOAM

6/2/2020	Extended Amortization to 30 yrs (based off 2018 AAV)
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Member Contribution Rate 12.00%
1/1/2012	E1 2% Comp COLA for past retirees (12/31/2011)
1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Fiscal Month - July
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	10 Year Vesting
7/1/2010	2.57% Mult. for Svc < 25 yrs , 1% for Svc>25 yrs (no max)
7/1/2010	Member Contribution Rate 6.00%
7/1/2010	E2 2% Comp COLA for future retirees (01/01/2010)
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

22 - COAM Command

6/2/2020	Extended Amortization to 30 yrs (based off 2018 AAV)
12/1/2016	Service Credit Purchase Estimates - Yes
8/1/2014	Member Contribution Rate 12.00%
1/1/2012	E1 2% Comp COLA for past retirees (12/31/2011)
1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	25 Years & Out
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	10 Year Vesting
7/1/2010	2.50% Mult. for Svc < 25 yrs , 1% for Svc>25 yrs (no max)
7/1/2010	Benefit F55 (With 10 Years of Service)
7/1/2010	Member Contribution Rate 6.00%
7/1/2010	E2 2% Comp COLA for future retirees (01/01/2010)
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

50 - IAFF after 7/1/2011

3/1/2018	Participant Contribution Rate 12%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2012	E2 2% COLA for future retirees (07/01/2011)
7/1/2011	Annuity Withdrawal - T-Bill Rate
7/1/2011	Day of work defined as 80 Hours a Month for All employees.
7/1/2011	Benefit D2 - 66.67% FAC
7/1/2011	25 Years & Out
7/1/2011	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2011	Non Standard Compensation Definition
7/1/2011	Non Standard Death Benefit
7/1/2011	Non Standard Disability
7/1/2011	10 Year Vesting
7/1/2011	2% < 25 yrs 1% > 25 yrs (55% max)
7/1/2011	Benefit F55 (With 10 Years of Service)
7/1/2011	Member Contribution Rate 6.00%
7/1/2010	Fiscal Month - July
5/24/2010	Covered by Act 88
	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	SLIF Increase Assumption
01 - GCSPPA & Library	0.00%	3.85%
02 - POAM Dispatchers	0.00%	2.88%
05 - IAFF Fire	3.00%	0.00%
10 - Retirees 1968 - October 1993	3.00%	0.00%
20 - POAM Police Offrs & Detective	0.00%	3.85%
21 - TPOAM	3.00%	0.00%
22 - COAM Command	0.00%	3.85%
50 - IAFF after 7/1/2011	3.00%	0.00%

Miscellaneous and Technical Assumptions

Loads - For divisions with the Annuity Withdrawal provision, if the Treasury Bill rate of interest is used, the normal retirement and early retirement liabilities and normal costs are increased by 6%.

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:

	12/31/2020	12/31/2019	12/31/2018
1. Ratio of the market value of assets to total payroll	8.9	9.0	9.1
2. Ratio of actuarial accrued liability to payroll	15.8	15.9	16.1
3. Ratio of actives to retirees and beneficiaries	0.6	0.6	0.6
4. Ratio of market value of assets to benefit payments	9.7	8.5	8.8
5. Ratio of net cash flow to market value of assets (boy)	-4.1%	-6.0%	-5.0%

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, 2020**	
11	Indicate number of active members	106
12	Indicate number of inactive members (excluding pending refunds)	7
13	Indicate number of retirees and beneficiaries	180
14	**Investment Performance for Calendar Year Ending December 31, 2020**[1]	
15	Enter actual rate of return - prior 1-year period	13.59%
16	Enter actual rate of return - prior 5-year period	9.35%
17	Enter actual rate of return - prior 10-year period	7.91%
18	**Actuarial Assumptions**	
19	Actuarial assumed rate of investment return[2]	7.35%
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]	28
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	$59,947,061
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions[5]	$114,535,960
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending June 30, 2021	$4,846,272

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) indicate "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 7.00%.