



Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report
December 31, 2018 - Garden City City of (8255)





Spring, 2019

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, 2018. 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, and 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, 2018,
- Establish contribution requirements for the fiscal year beginning July 1, 2020,
- 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, 2018. 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. The most recent study was completed in 2015, as prepared by the prior actuary, and is the basis of the assumptions and methods currently in place. **At the February 28, 2019 board meeting, the MERS Retirement Board adopted new economic assumptions effective with the December 31, 2019 annual actuarial valuation, which will impact contributions beginning in 2021.** An illustration of the potential impact is found in this report.

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-2018AnnualActuarialValuation-Appendix.pdf>.

The actuarial assumptions used for this valuation are reasonable for purposes of the measurement.

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.



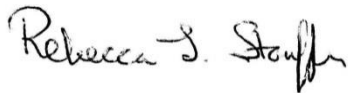
This report was prepared at the request of the MERS Retirement Board and may be provided only in its entirety by the municipality to other interested parties (MERS customarily provides the full report on request to associated third parties such as the auditor for the municipality). GRS is not responsible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



Table of Contents

Executive Summary	1
Table 1: Employer Contribution Details For the Fiscal Year Beginning July 1, 2020	9
Table 2: Benefit Provisions	11
Table 3: Participant Summary	15
Table 4: Reported Assets (Market Value)	16
Table 5: Flow of Valuation Assets	17
Table 6: Actuarial Accrued Liabilities and Valuation Assets as of December 31, 2018.....	18
Table 7: Actuarial Accrued Liabilities - Comparative Schedule	20
Tables 8 and 9: Division-Based Comparative Schedules	21
Table 10: Division-Based Layered Amortization Schedule	29
GASB 68 Information.....	37
Benefit Provision History.....	38
Plan Provisions, Actuarial Assumptions, and Actuarial Funding Method	42
Risk Commentary	43
State Reporting	45

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.

	12/31/2018	12/31/2017
Funded Ratio*	62%	65%

* Reflects assets from Surplus divisions, if any.

There has been a change in actuary and actuarial software since the December 31, 2017 valuation. 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. Changes to the actuarial assumptions and methods based on the 2015 Experience Study are phased-in over a 5-year period. This valuation reflects the fourth year of the phase-in.

Your minimum required contribution is the amount in the “Phase-in” columns. By default, MERS will invoice you the phased-in contribution amount, but strongly encourages you to contribute more than the minimum required contribution. If you requested and have been billed using No Phase-in rates, your 2019 rates will continue to use the No Phase-in method. If you have been billed using the Phased-in rates and wish to change to rates based on No Phase-in, please contact MERS.

	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:	12/31/2018	12/31/2018	12/31/2017	12/31/2017	12/31/2018	12/31/2018	12/31/2017	12/31/2017
Fiscal Year Beginning:	July 1, 2020	July 1, 2020	July 1, 2019	July 1, 2019	July 1, 2020	July 1, 2020	July 1, 2019	July 1, 2019
Division								
01 - GCSPPA & Library	82.99%	84.65%	60.39%	63.23%	\$ 77,207	\$ 78,749	\$ 65,622	\$ 68,706
02 - POAM Dispatchers	-	-	-	-	1,790	1,827	714	788
05 - IAFF Fire	-	-	-	-	37,778	38,864	37,271	39,781
10 - Retirees 1968 - October 1993	-	-	-	-	17,271	17,804	12,579	13,645
20 - POAM Police Offrs & Detective	49.12%	50.36%	38.12%	39.92%	42,033	43,093	45,027	47,147
21 - TPOAM	33.98%	35.16%	29.74%	32.18%	48,507	50,189	40,956	44,320
22 - COAM Command	44.36%	45.39%	46.30%	49.39%	40,032	40,961	27,801	29,659
50 - IAFF after 7/1/2011	2.86%	2.87%	7.93%	8.00%	1,969	1,976	4,381	4,421
Municipality Total					\$ 266,587	\$ 273,463	\$ 234,351	\$ 248,467

Employee contribution rates:

Valuation Date:	Employee Contribution Rate	
	12/31/2018	12/31/2017
Division		
01 - GCSPPA & Library	12.00%	12.00%
02 - POAM Dispatchers	12.00%	12.00%
05 - IAFF Fire	12.00%	5.00%
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%	6.00%

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 2020 for the entire employer would be \$417,381, instead of \$273,463.

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)
- Experience of the plan (investment experience and demographic experience); this is the difference between actual experience of the plan and the actuarial assumptions.

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 **more than half** 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 **7.75%** 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 2019

At the February 28, 2019 board meeting, the MERS Retirement Board adjusted key economic assumptions. These assumptions, in particular the investment return assumption, have a significant effect on a plan's required contribution and funding level. Historically low interest rates, along with high equity market valuations, have led to reductions in projected returns for most asset classes. This has resulted in a Board adopted reduction in the investment rate of return assumption to 7.35%, effective with the December 31, 2019 valuation first impacting 2021 contributions. The Board also changed the assumed rate of wage inflation from 3.75% to 3.00%, with the same effective date. This report includes a "What If" scenario of 7.35%/3.00% in order to show the potential impact of this assumption change.

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 2018 was 3.80%, while the actual market rate of return was (4.12)%**. 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, 2018 the actuarial value of assets is 110% of market value due to asset smoothing. This means that meeting the actuarial assumption in the next few years will require average annual market returns that exceed the 7.75% investment return assumption, or contribution requirements will continue to increase.

If the December 31, 2018 valuation results were based on market value instead of actuarial value:

- The funded percent of your entire municipality would be 56% (instead of 62%); and
- Your total employer contribution requirement for the fiscal year starting July 1, 2020 would be \$3,721,548 (instead of \$3,281,556)

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 and the Wage Inflation assumption. Lower investment returns would result in higher required employer contributions, and vice-versa. Lower wage inflation generally results in lower required employer contributions as a dollar amount in the long run, and vice versa.

The relative impact of each economic scenario 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, 2018 valuation, and are for the municipality in total, not by division. These results do not reflect a 5-year 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.

The Retirement Board has adopted a change to the Investment Return Assumption from 7.75% to 7.35%, and the wage inflation from 3.75% to 3.00%. This change will be effective in the December 31, 2019 valuation which will impact the Fiscal Year 2021 contribution. The scenario shown using these assumptions as of December 31, 2018 is illustrative only. The actual impact of this change when reflected in the 2019 valuation will be different.

12/31/2018 Valuation Results	Assumed Future Annual Smoothed Rate of Investment Return		
	Lower Future Annual Returns	Adopted 2019 Assumption	Valuation Assumptions
Investment Return Assumption	5.75%	7.35%	7.75%
Wage Increase Assumption	3.75%	3.00%	3.75%
Accrued Liability	\$ 120,250,456	\$ 99,147,840	\$ 95,427,991
Valuation Assets ¹	\$ 58,823,439	\$ 58,823,439	\$ 58,823,439
Unfunded Accrued Liability	\$ 61,427,017	\$ 40,324,401	\$ 36,604,552
Funded Ratio	49%	59%	62%
Monthly Normal Cost	\$ 98,370	\$ 38,314	\$ 38,194
Monthly Amortization Payment	\$ 337,296	\$ 266,531	\$ 235,269
Total Employer Contribution²	\$ 435,666	\$ 304,845	\$ 273,463

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

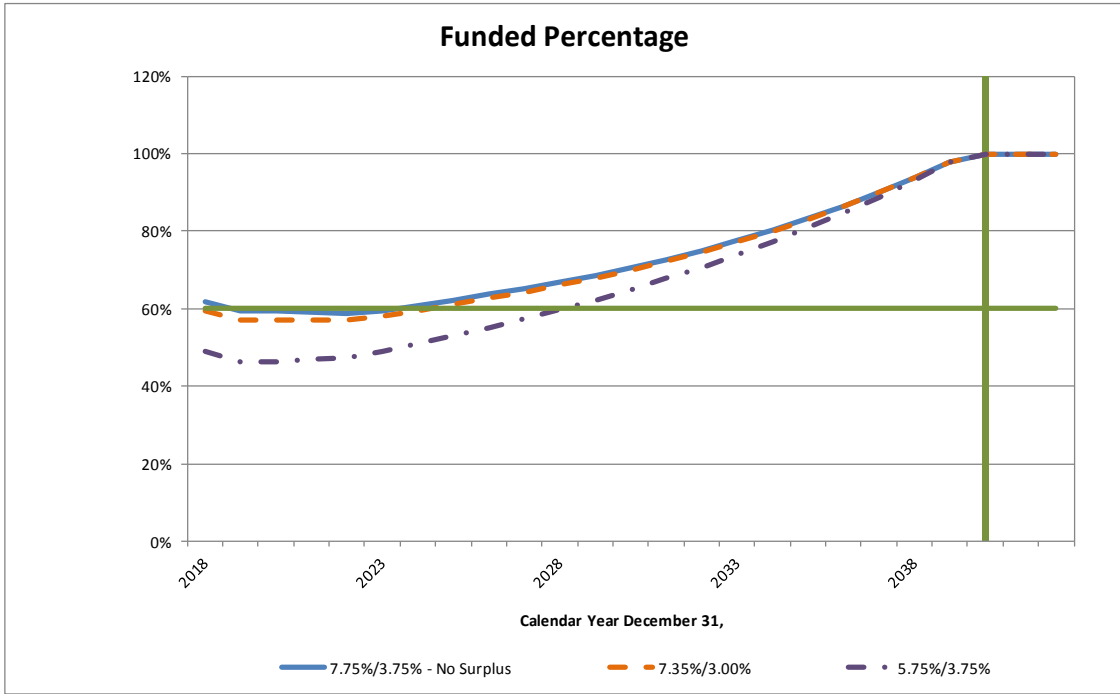
The next two pages show projections of the plan's funded ratio and computed employer contributions under the actuarial assumptions used in the valuation and alternate economic scenarios. All three projections take into account the past investment losses that will continue to affect the actuarial rate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

The 7.75%/3.75% scenario provides an estimate of computed employer contributions based on current actuarial assumptions, and a projected 7.75% 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 7.35%/3.00% and 5.75%/3.75% projections 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	Computed Annual Employer Contribution
7.75%¹/3.75%					
NO 5-YEAR PHASE-IN					
2018	2020	\$ 95,427,991	\$ 58,823,439	62%	\$ 3,281,556
2019	2021	\$ 97,800,000	\$ 58,200,000	60%	\$ 3,670,000
2020	2022	\$ 100,100,000	\$ 59,300,000	59%	\$ 3,870,000
2021	2023	\$ 102,500,000	\$ 60,600,000	59%	\$ 4,110,000
2022	2024	\$ 104,700,000	\$ 61,600,000	59%	\$ 4,390,000
2023	2025	\$ 106,800,000	\$ 63,600,000	60%	\$ 4,590,000
7.35%¹/3.00%					
NO 5-YEAR PHASE-IN					
2018	2020	\$ 99,147,840	\$ 58,823,439	59%	\$ 3,658,140
2019	2021	\$ 101,400,000	\$ 57,900,000	57%	\$ 4,030,000
2020	2022	\$ 103,600,000	\$ 59,100,000	57%	\$ 4,220,000
2021	2023	\$ 105,800,000	\$ 60,500,000	57%	\$ 4,440,000
2022	2024	\$ 107,900,000	\$ 61,500,000	57%	\$ 4,710,000
2023	2025	\$ 109,800,000	\$ 63,700,000	58%	\$ 4,890,000
5.75%¹/3.75%					
NO 5-YEAR PHASE-IN					
2018	2020	\$ 120,250,456	\$ 58,823,439	49%	\$ 5,227,992
2019	2021	\$ 122,900,000	\$ 57,100,000	46%	\$ 5,690,000
2020	2022	\$ 125,500,000	\$ 58,100,000	46%	\$ 5,980,000
2021	2023	\$ 128,100,000	\$ 60,300,000	47%	\$ 6,270,000
2022	2024	\$ 130,600,000	\$ 61,900,000	47%	\$ 6,640,000
2023	2025	\$ 133,000,000	\$ 65,300,000	49%	\$ 6,890,000

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

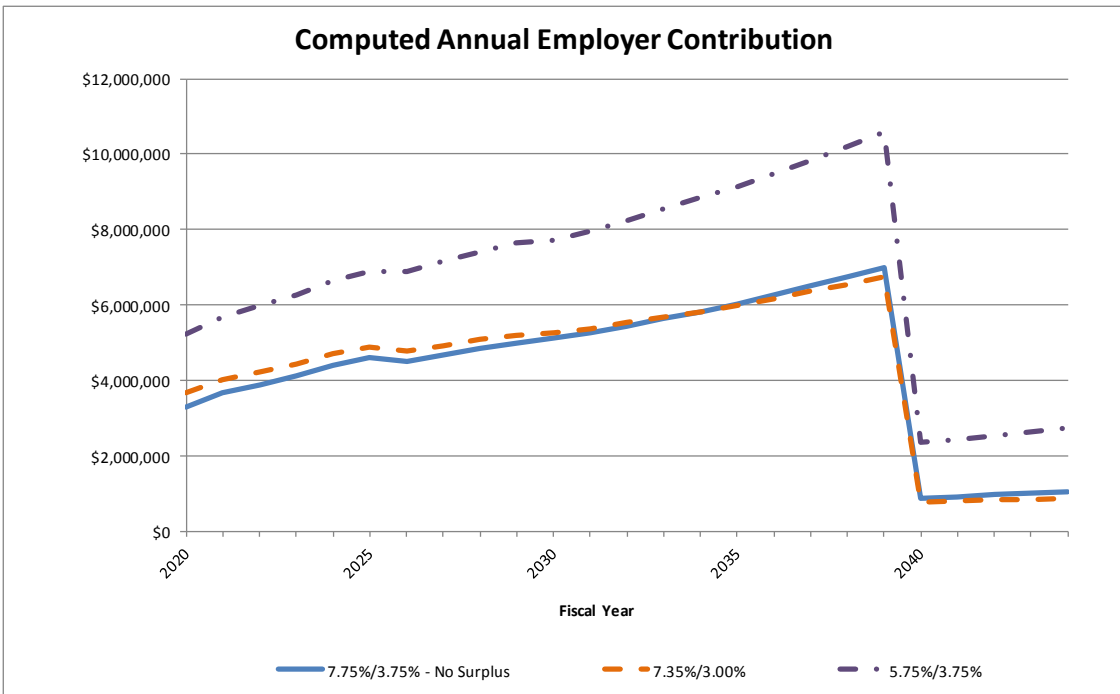
² Valuation Assets do not include assets from Surplus divisions, if any.



Notes:

All projected funded percentages are shown with no phase-in.

The green indicator lines have been added at 60% funded and 22 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, 2020

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	Payment of the Unfunded Accrued Liability ⁴	Computed Employer Contribut. No Phase-In				
Percentage of Payroll									
01 - GCSPPA & Library	19.36%	12.00%	7.36%	77.29%	84.65%	82.99%			0.79%
02 - POAM Dispatchers	0.00%	12.00%	-	-	-	-			
05 - IAFF Fire	19.52%	12.00%	-	-	-	-	31.39%	30.55%	
10 - Retirees 1968 - October 1993	0.00%	0.00%	-	-	-	-			
20 - POAM Police Offrs & Detective	20.77%	12.00%	8.77%	41.59%	50.36%	49.12%			0.85%
21 - TPOAM	18.83%	12.00%	6.83%	28.33%	35.16%	33.98%			0.74%
22 - COAM Command	20.13%	12.00%	8.13%	37.26%	45.39%	44.36%			0.66%
50 - IAFF after 7/1/2011	15.12%	12.00%	3.12%	-0.25%	2.87%	2.86%	31.39%	30.55%	0.83%
Estimated Monthly Contribution³									
01 - GCSPPA & Library			\$ 6,847	\$ 71,902	\$ 78,749	\$ 77,207			
02 - POAM Dispatchers			0	1,827	1,827	1,790			
05 - IAFF Fire			4,607	34,257	38,864	37,778			
10 - Retirees 1968 - October 1993			0	17,804	17,804	17,271			
20 - POAM Police Offrs & Detective			7,505	35,588	43,093	42,033			
21 - TPOAM			9,750	40,439	50,189	48,507			
22 - COAM Command			7,336	33,625	40,961	40,032			
50 - IAFF after 7/1/2011			2,149	(173)	1,976	1,969			
Total Municipality			\$ 38,194	\$ 235,269	\$ 273,463	\$ 266,587			
Estimated Annual Contribution³			\$ 458,328	\$ 2,823,228	\$ 3,281,556	\$ 3,199,044			

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 with 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).

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

Table 2: Benefit Provisions

01 - GCSPPA & Library: Open Division

	2018 Valuation	2017 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% 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% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

02 - POAM Dispatchers: Closed to new hires

	2018 Valuation	2017 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% 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% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

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

	2018 Valuation	2017 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% 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% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2% (Compound)
Employee Contributions:	12.00%	5.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

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

	2018 Valuation	2017 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% (Compound)
Employee Contributions:	-	-
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

20 - POAM Police Offrs & Detective: Open Division

	2018 Valuation	2017 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% 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% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

21 - TPOAM: Open Division

	2018 Valuation	2017 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% 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% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

22 - COAM Command: Open Division

	2018 Valuation	2017 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% 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% (Compound)
COLA for Current Retirees:	2.00% (Compound)	2% (Compound)
Employee Contributions:	12.00%	12.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year	D2 (67%) Annuity Withdrawal (Treasury Bill Rate) Non-Duty Death 25% of FAC Minimum SLIF (30 Days) Non-Duty Disability 25% of FAC Minimum Non-Duty Death/Disability Eligibility: 1 year
Act 88:	Yes (Adopted 5/24/2010)	Yes (Adopted 5/24/2010)

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

	2018 Valuation	2017 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% 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% (Non-Compound)
Employee Contributions:	12.00%	6.00%
D-2:	D2 (67%) Annuity Withdrawal (Treasury Bill Rate)	D2 (67%) Annuity Withdrawal (Treasury Bill Rate)
Act 88:	No	No

Table 3: Participant Summary

Division	2018 Valuation		2017 Valuation		2018 Valuation		
	Number	Annual Payroll ¹	Number	Annual Payroll ¹	Average Age	Average Benefit Service ²	Average Eligibility Service ²
01 - GCSPPA & Library							
Active Employees	16	\$ 1,018,017	18	\$ 1,189,107	44.1	11.1	12.0
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	38	1,499,555	35	1,326,464	64.9		
02 - POAM Dispatchers							
Active Employees	0	\$ 0	0	\$ 0	0.0	0.0	0.0
Vested Former Employees	1	11,200	2	23,752	51.9	9.5	17.0
Retirees and Beneficiaries	7	168,230	6	153,582	64.7		
05 - IAFF Fire							
Active Employees	12	\$ 894,149	13	\$ 971,843	48.2	19.3	19.5
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	17	745,606	16	686,846	67.7		
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	33	597,925	35	619,199	79.1		
20 - POAM Police Offrs & Detective							
Active Employees	19	\$ 936,484	22	\$ 1,292,529	34.3	5.4	6.6
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	27	946,443	26	901,841	58.8		
21 - TPOAM							
Active Employees	32	\$ 1,562,201	32	\$ 1,507,265	44.1	13.2	13.4
Vested Former Employees	2	19,800	2	19,800	49.3	9.1	12.7
Retirees and Beneficiaries	40	1,031,477	40	1,010,893	65.4		
22 - COAM Command							
Active Employees	12	\$ 987,428	8	\$ 657,110	47.1	20.7	21.5
Vested Former Employees	0	0	1	23,250	0.0	0.0	0.0
Retirees and Beneficiaries	18	804,831	18	788,609	62.8		
50 - IAFF after 7/1/2011							
Active Employees	10	\$ 529,820	7	\$ 397,863	30.7	2.8	2.8
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
Total Municipality							
Active Employees	101	\$ 5,928,099	100	\$ 6,015,717	41.8	12.0	12.5
Vested Former Employees	3	31,000	5	66,802	50.2	9.2	14.1
Retirees and Beneficiaries	180	5,794,067	176	5,487,434	66.7		
Total Participants	284		281				

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	2018 Valuation		2017 Valuation	
	Employer and Retiree ¹	Employee ²	Employer and Retiree ¹	Employee ²
01 - GCSPPA & Library	\$ 8,842,091	\$ 974,005	\$ 9,938,148	\$ 1,117,313
02 - POAM Dispatchers	1,773,123	39,097	1,987,989	63,690
05 - IAFF Fire	7,335,019	892,463	8,063,125	866,388
10 - Retirees 1968 - October 1993	2,629,776	0	3,257,492	0
20 - POAM Police Offrs & Detective	7,931,494	716,671	9,355,749	958,872
21 - TPOAM	9,643,500	1,762,182	10,827,195	1,397,172
22 - COAM Command	9,378,167	1,526,624	9,959,214	1,017,292
50 - IAFF after 7/1/2011	126,265	132,785	123,768	77,058
Municipality Total³	\$ 47,659,435	\$ 6,043,828	\$ 53,512,680	\$ 5,497,785
Combined Assets³	\$53,703,263		\$59,010,465	

¹ Reserve for Employer Contributions and Benefit Payments.

² Reserve for Employee Contributions.

³ Totals may not add due to rounding.

The December 31, 2018 valuation assets (actuarial value of assets) are equal to 1.095342 times the reported market value of assets (compared to 1.011321 as of December 31, 2017). 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						
2008	\$ 0		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2009	0		0	0	0	0	0	0
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

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, 2018**

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	\$ 3,518,942	\$ 0	\$ 18,835,760	\$ 25,245	\$ 22,379,947	\$ 10,751,981	48.0%	\$ 11,627,966
02 - POAM Dispatchers	0	77,256	2,054,786	15,485	2,147,527	1,985,001	92.4%	162,526
05 - IAFF Fire	5,405,134	0	9,181,403	0	14,586,537	9,011,907	61.8%	5,574,630
10 - Retirees 1968 - October 1993	0	0	4,318,994	0	4,318,994	2,880,504	66.7%	1,438,490
20 - POAM Police Offrs & Detective	1,930,478	0	13,378,630	16,218	15,325,326	9,472,698	61.8%	5,852,628
21 - TPOAM	6,223,796	164,147	12,669,952	0	19,057,895	12,493,123	65.6%	6,564,772
22 - COAM Command	6,407,828	0	10,886,613	44,843	17,339,284	11,944,476	68.9%	5,394,808
50 - IAFF after 7/1/2011	260,479	0	0	12,002	272,481	283,749	104.1%	(11,268)
Total	\$ 23,746,657	\$ 241,403	\$ 71,326,138	\$ 113,793	\$ 95,427,991	\$ 58,823,439	61.6%	\$ 36,604,552

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	\$ 5,665,613	\$ 0	\$ 9,181,403	\$ 12,002	\$ 14,859,018	\$ 9,295,656	62.6%	\$ 5,563,362

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

Table 7: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2004	\$ 0	\$ 0	0%	\$ 0
2005	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2004, 2008, 2009, 2010, 2011, 2012 and 2015 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.

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
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 02 - POAM Dispatchers

Table 8-02: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 05 - IAFF Fire

Table 8-05: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 10 - Retirees 1968 - October 1993

Table 8-10: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 20 - POAM Police Offrs & Detective

Table 8-20: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 21 - TPOAM

Table 8-21: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 22 - COAM Command

Table 8-22: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 50 - IAFF after 7/1/2011

Table 8-50: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
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)

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012 and 2015 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		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
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%

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 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 8,541,106	23	\$ 9,008,425	20	\$ 653,916
(Gain)/Loss	12/31/2016	629,178	22	711,643	20	51,660
(Gain)/Loss	12/31/2017	655,969	21	737,007	20	53,496
(Gain)/Loss	12/31/2018	1,277,864	20	1,429,258	20	103,752
Total				\$ 11,886,333		\$ 862,824

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 02 - POAM Dispatchers

Table 10-02: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
(Gain)/Loss	12/31/2016	\$ 19,869	10	\$ 19,826	8	\$ 2,928
(Gain)/Loss	12/31/2017	48,473	10	51,528	9	6,876
(Gain)/Loss	12/31/2018	88,618	10	99,117	10	12,120
Total				\$ 170,471		\$ 21,924

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 05 - IAFF Fire

Table 10-05: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 4,811,128	23	\$ 5,145,975	20	\$ 373,548
(Gain)/Loss	12/31/2016	62,826	22	71,069	20	5,160
(Gain)/Loss	12/31/2017	2,067	21	2,317	20	168
(Gain)/Loss	12/31/2018	323,628	20	361,969	20	26,280
Amendment	12/31/2018	72,939	20	81,580	20	5,928
Total				\$ 5,662,910		\$ 411,084

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 10 - Retirees 1968 - October 1993

Table 10-10: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 975,159	13	\$ 865,764	7	\$ 143,364
(Gain)/Loss	12/31/2016	173,288	11	174,692	7	28,932
(Gain)/Loss	12/31/2017	115,459	10	122,750	9	16,392
(Gain)/Loss	12/31/2018	182,419	10	204,031	10	24,960
Total				\$ 1,367,237		\$ 213,648

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 20 - POAM Police Offrs & Detective

Table 10-20: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 4,570,532	23	\$ 4,872,573	20	\$ 353,700
(Gain)/Loss	12/31/2016	523,250	22	591,822	20	42,960
(Gain)/Loss	12/31/2017	781,095	21	877,588	20	63,708
(Gain)/Loss	12/31/2018	(410,238)	20	(458,841)	20	(33,312)
Total				\$ 5,883,142		\$ 427,056

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 21 - TPOAM

Table 10-21: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 4,878,219	23	\$ 5,208,087	20	\$ 378,048
(Gain)/Loss	12/31/2016	670,286	22	758,130	20	55,032
(Gain)/Loss	12/31/2017	40,256	21	45,225	20	3,288
(Gain)/Loss	12/31/2018	602,288	20	673,643	20	48,900
Total				\$ 6,685,085		\$ 485,268

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 22 - COAM Command

Table 10-22: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 3,464,047	23	\$ 3,649,881	20	\$ 264,948
(Gain)/Loss	12/31/2016	715,298	22	809,041	20	58,728
(Gain)/Loss	12/31/2017	(166,093)	21	(186,613)	20	(13,548)
(Gain)/Loss	12/31/2018	1,150,065	20	1,286,318	20	93,372
Total				\$ 5,558,627		\$ 403,500

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Division 50 - IAFF after 7/1/2011

Table 10-50: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
(Gain)/Loss	12/31/2017	\$ (4,853)	15	\$ (5,350)	14	\$ (504)
(Gain)/Loss	12/31/2018	18,468	15	20,656	15	1,836
Amendment	12/31/2018	(24,907)	10	(27,858)	10	(3,408)
Total				\$ (12,552)		\$ (2,076)

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, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 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 68 Information

The following information has been prepared to provide some of the information necessary to complete GASB Statement No. 68 disclosures. Statement 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:	12/31/2018
Measurement Date of the Total Pension Liability (TPL):	12/31/2018
At 12/31/2018, 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):	18
Active employees:	<u>101</u>
	299
Total Pension Liability as of 12/31/2017 measurement date:	\$ 90,107,099
Total Pension Liability as of 12/31/2018 measurement date:	\$ 92,924,904
Service Cost for the year ending on the 12/31/2018 measurement date:	\$ 1,056,603
Change in the Total Pension Liability due to:	
- Benefit changes ¹ :	\$ 44,818
- Differences between expected and actual experience ² :	\$ 805,483
- Changes in assumptions ² :	\$ 0

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

²Changes 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.

Average expected remaining service lives of all employees (active and inactive):	3
Covered employee payroll: (Needed for Required Supplementary Information)	\$ 5,928,099

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

	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Change in Net Pension Liability as of 12/31/2018:	\$ 10,731,161	\$ -	\$ (8,981,581)

Note: The current discount rate shown for GASB 68 purposes is higher than the MERS assumed rate of return. This is because for GASB 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

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	25 Years & Out
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	10 Year Vesting
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
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	25 Years & Out
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	Benefit FAC-4 (4 Year Final Average Compensation)
7/1/2010	10 Year Vesting
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
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	E2 2% Comp COLA for future retirees (01/01/2010)

02 - POAM Dispatchers

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

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 25 Years & Out
7/1/2010 Benefit D2 - 66.67% FAC
7/1/2010 Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010 10 Year Vesting
7/1/2010 Exclude Temporary Employees requiring less than 12 months
7/1/2010 Non Standard Compensation Definition
7/1/2010 Non Standard Death Benefit
7/1/2010 Non Standard Disability
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 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

12/1/2016 Service Credit Purchase Estimates - Yes
1/1/2011 E1 2% COLA for past retirees (07/01/2010)
7/1/2010 25 Years & Out
7/1/2010 Benefit D2 - 66.67% FAC
7/1/2010 Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010 10 Year Vesting
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 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

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)

20 - POAM Police Offrs & Detective

1/1/2011	Flexible E 2% COLA Adopted (01/01/2011)
7/1/2010	25 Years & Out
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	10 Year Vesting
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
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

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	25 Years & Out
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	10 Year Vesting
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
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	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)
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

22 - COAM Command

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)

22 - COAM Command

7/1/2010	25 Years & Out
7/1/2010	Benefit D2 - 66.67% FAC
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	10 Year Vesting
7/1/2010	Exclude Temporary Employees requiring less than 12 months
7/1/2010	Non Standard Compensation Definition
7/1/2010	Non Standard Death Benefit
7/1/2010	Non Standard Disability
7/1/2010	Annuity Withdrawal - T-Bill Rate
7/1/2010	Sick Eligibility - up to 60 days paid at 50% of pay
7/1/2010	Day of work defined as 80 Hours a Month for All employees.
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	25 Years & Out
7/1/2011	Benefit D2 - 66.67% FAC
7/1/2011	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2011	10 Year Vesting
7/1/2011	Non Standard Compensation Definition
7/1/2011	Non Standard Death Benefit
7/1/2011	Non Standard Disability
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	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
	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%	3.84%
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%	3.84%
21 - TPOAM	3.00%	0.00%
22 - COAM Command	0.00%	3.84%
50 - IAFF after 7/1/2011	3.00%	0.00%

Withdrawal Rate Scaling Factor

Division	Withdrawal Rate Scaling Factor
01 - GCSPPA & Library	70%
02 - POAM Dispatchers	70%
05 - IAFF Fire	70%
10 - Retirees 1968 - October 1993	100%
20 - POAM Police Offrs & Detective	70%
21 - TPOAM	70%
22 - COAM Command	70%
50 - IAFF after 7/1/2011	70%

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 3%.

Amortization Policy for Closed Divisions

Closed Division	Amortization Option
10 - Retirees 1968 - October 1993	Accelerated to 5-Year Amortization

Please see Appendix on MERS website for a detailed description of the amortization options available for closed divisions within an open municipality.

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:

1. Ratio of the market value of assets to total payroll	9.1
2. Ratio of actuarial accrued liability to payroll	16.1
3. Ratio of actives to retirees and beneficiaries	0.6
4. Ratio of market value of assets to benefit payments	8.8
5. Ratio of net cash flow to market value of assets (boy)	-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 active 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 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, 2018		
11	Indicate number of active members	101
12	Indicate number of inactive members	3
13	Indicate number of retirees and beneficiaries	180
14 Investment Performance for Calendar Year Ending December 31, 2018¹		
15	Enter actual rate of return - prior 1-year period	-3.64%
16	Enter actual rate of return - prior 5-year period	4.94%
17	Enter actual rate of return - prior 10-year period	8.25%
18 Actuarial Assumptions		
19	Actuarial assumed rate of investment return ²	7.75%
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	20
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	\$58,823,439
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions	\$103,656,065
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending June 30,2019	\$3,632,292

1. The Municipal Employees’ Retirement System’s investment performance has been provided to GRS from MERS Investment Staff and included here for reporting purposes. This investment performance figures reported are net of fees 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.”