MUNICIPAL EMPLOYEES' RETIREMENT SYSTEM OF MICHIGAN

ANNUAL ACTUARIAL VALUATION REPORT DECEMBER 31, 2017

FLINT, CHTR TWP OF (2512)

Spring, 2018

Flint, Chtr Twp 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 as of December 31, 2017. The report includes the determination of liabilities and contribution rates resulting from the participation of Flint, Chtr Twp of (2512) in the Municipal Employees' Retirement System of Michigan ("MERS"). MERS is an independent, professional retirement services company that was created to administer retirement plans for Michigan municipalities on a not-for-profit basis. This report contains the minimum actuarially determined contribution requirement, in alignment with the MERS Plan Documents, funding policy and Michigan Constitution. Flint, Chtr Twp of is responsible for the employer contributions needed to provide MERS benefits for its employees and former employees under the Michigan Constitution and the MERS Plan Document.

The purpose of the December 31, 2017 annual actuarial valuation is to:

- Measure funding progress
- Establish contribution requirements for the fiscal year beginning January 1, 2019
- Provide actuarial information in connection with applicable Governmental Accounting Standards Board (GASB) statements

This valuation report should not be relied upon for any other purpose. Reliance on information contained in this report by anyone for anything other than the intended purpose could be misleading.

The valuation uses financial data, plan provision data, and participant data as of December 31, 2017 furnished by MERS. In accordance with Actuarial Standards of Practice No. 23, the data was checked for internal and year to year consistency as well as general reasonableness, but was not otherwise audited. CBIZ Retirement Plan Services does not assume responsibility for the accuracy or completeness of the data used in this valuation.

The actuarial assumptions and methods are adopted by the MERS Retirement Board, and are reviewed every five years in an Experience Study. The most recent study was completed in 2015. Please refer to the division-specific assumptions described in table(s) in this report, and to the Appendix on the MERS website at:
www.mersofmich.com/Portals/0/Assets/Resources/AAV-Appendix/MERS-2017AnnualActuarialValuation-Appendix.pdf.

The actuarial assumptions used for this valuation produce results that we believe are reasonable.

To the best of our knowledge, this report is complete and accurate, was prepared in conformity with generally recognized actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and is in compliance with Act No. 220 of the Public Acts of 1996, as amended, and the MERS Plan Document as revised. All of the undersigned are members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. 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 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). CBIZ Retirement Plan Services is not responsible for the consequences of any unauthorized use.

You should notify MERS if you disagree with anything contained in the report or are aware of any information that would affect the results of the report that have not been communicated to us. 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,

Cathy Nagy, MAAA, FSA
Jim Koss, MAAA, ASA
Curtis Powell, MAAA, EA

TABLE OF CONTENTS

Executive Summary

Funded Ratio and Required Employer Contributions

The MERS Defined Benefit Plan is an agent multiple-employer plan, meaning that assets are pooled for investment purposes but separate accounts are maintained for each individual employer. Each municipality is responsible for their own plan liabilities; MERS does not borrow from one municipality's account to pay for another.

The funded ratio of a plan is the percentage of the dollar value of the accrued benefits that is covered by the actuarial value of assets.

Your Funded Ratio:

	12/31/2017 *	12/31/2016
Funded Ratio	63%	64%

* Reflects assets from Surplus divisions, if any.

Michigan Law requires that pension plans be pre-funded, meaning money is set aside now to pay for future benefits. Pension plans are usually funded by employer and employee contributions, and investment income.

How quickly a plan attains the 100% funding goal depends on many factors such as:

- The current funded ratio
- The future experience of the plan
- The amortization period

It is more important to look at the trend in the funded ratio over a period of time than at a particular point in time.

Your Required Employer Contributions:

Your computed employer contributions are shown in the following table. Employee contributions, if any, are in addition to the computed employer contributions. Changes to the assumptions and methods based on the 2015 Experience Study were first reflected in the December 31, 2015 valuations. The impact of these changes is being phased-in over a 5 year period. The phase-in allows the employer to spread the impact of the new assumptions over 5 fiscal years. This valuation reflects the third 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 for 2018 your municipality is making employer contributions based on rates without the phase-in applied, contact MERS to ensure the No Phase-in rate is used again for 2019 and not the defaulted phase-in rates.

	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:	12/31/2017	12/31/2017	12/31/2016	12/31/2016	12/31/2017	12/31/2017	12/31/2016	12/31/2016
Fiscal Year Beginning:	January 1, 2019	January 1, 2019	January 1, 2018	January 1, 2018	January 1, 2019	January 1, 2019	January 1, 2018	January 1, 2018
Division								
01 - Cler Union/Non	8.53%	8.53%	7.47%	7.47%	$ 5,889	$ 5,889	$ 4,636	$ 4,636
02 - Plc Officrs	-	-	-	-	52,092	54,382	46,637	50,072
05 - IAFF EE Hired aft 1/1/	3.57%	3.57%			467	467		
20 - Police Chief	3.00%	4.00%	4.47%	6.09%	293	391	405	552
21 - Police Command Officer	38.98%	40.94%	36.40%	39.34%	25,161	26,429	23,572	25,474
22 - Pol Off hired after 1/	2.76%	2.76%	2.84%	2.84%	2,698	2,698	2,406	2,406
Municipality Total					**$ 86,600**	**$ 90,256**	**$ 77,656**	**$ 83,140**

Employee contribution rates reflected in the valuations are shown below:

	Employee Contribution Rate			
	Phase-in	No Phase-in	Phase-in	No Phase-in
Valuation Date:	12/31/2017	12/31/2017	12/31/2016	12/31/2016
Fiscal Year Beginning:	January 1, 2019	January 1, 2019	January 1, 2018	January 1, 2018
Division				
01 - Cler Union/Non	8.53%	8.53%	7.47%	7.47%
02 - Plc Officrs	10.00%	10.00%	10.00%	10.00%
05 - IAFF EE Hired aft 1/1/	10.00%	10.00%	0.00%	0.00%
20 - Police Chief	7.00%	7.00%	7.00%	7.00%
21 - Police Command Officer	10.00%	10.00%	10.00%	10.00%
22 - Pol Off hired after 1/	10.00%	10.00%	10.00%	10.00%

Allocation of the phase-in contributions between the employer and members was done in a manner which the actuaries believe to be equitable, based on information provided by MERS. The actuaries assume no responsibility if the allocation method conflicts with any particular employer cap agreement.

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 divisions 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 2019 for the entire employer would be $145,388, instead of $90,256.

If you are interested in making additional contributions, please contact MERS and they can assist you with evaluating your options.

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. For example:
    - Lower actual investment returns would result in higher required employer contributions, and vice-versa.
    - Smaller than assumed pay increases would lower required employer contributions.
    - Reductions in the number of active employees would lower required contribution dollars, but would usually increase the contribution rate expressed as a percentage of (the now lower) payroll.
    - Retirements at earlier ages than assumed would usually increase required employer contributions.
    - More non-vested terminations of employment than assumed would decrease required contributions.
    - More disabilities or survivor (death) benefits than assumed would increase required contributions.
    - Longer lifetimes after retirement than assumed would increase required employer contributions.

Actuarial valuations do not affect the ultimate cost of the plan; the benefit payments (current and future) determine the cost of the plan. Actuarial valuations only affect the timing of the contributions into the plan. Because assumptions are for the long term, plan experience will not match the actuarial assumptions in any given year (except by coincidence). Each annual actuarial valuation will adjust the required employer contributions up or down based on the prior year's actual experience.

Comments on Investment Return Assumption and Asset Smoothing

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 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 investment return assumptions, please review the budget projection scenarios later in this report.

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 2017 was 6.08%, while the actual market rate of return was 13.07%**. 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 visit our Defined Benefit resource page on the MERS website.

As of December 31, 2017 the actuarial value of assets is 101% 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, 2017 valuation results were based on market value instead of the actuarial value:

- The funded percent of your entire municipality would be 62% (instead of 63%); and
- Your total employer contribution requirement for the fiscal year starting January 1, 2019 would be $1,101,372 (instead of $1,083,072).

Risk Characteristics of Defined Benefit Plans

It is important to understand that Defined Benefit retirement plans, the plan sponsor, and the plan participants are exposed to certain risks. While risks cannot be eliminated entirely, they can be managed through various strategies. Below are a few examples of risk (this is not an all-inclusive list):

- Economic - investment return, wage inflation, etc.
- Demographic - longevity, disability, retirement, etc.
- Plan Sponsor and Employees - contribution volatility, attract/retain employees, etc.

The MERS Retirement Board adopts certain assumptions and methods to manage the economic and demographic risks, and the contribution volatility risks. For example, the investment risk is the largest economic risk and is managed by having a balanced portfolio and a clearly defined investment strategy. Demographic risks are managed by preparing special studies called experience studies on a regular basis to determine if the assumptions used are reasonable compared to the experience. An Experience Study is completed every five years to review the assumptions and methods. The next Experience Study will be completed in 2020.

Risk can also be managed through a plan design that provides benefits that are sustainable in the long run.

The Actuarial Standards Board has issued Actuarial Standards of Practice (ASOP) No. 51. This standard will be effective for any actuarial work with a measurement date on or after November 1, 2018. This means, the December 31, 2018 and later annual actuarial valuation reports for MERS will have to comply with this standard. This standard will require the actuary to identify risks that, in the actuary's professional judgment may significantly impact the plan's future financial condition. The actuary will have to assess the potential effects of the identified risks on the plan's future financial condition. The assessment may or may not be based on numerical calculations. However, the assessment should reflect the specifics of the plan (i.e. funded status, plan demographics, funding policy, etc.). If the actuary concludes that numerical calculations are necessary to assess the risk, the actuary can use various methods to quantify the risk such as scenario tests, sensitivity tests, stress tests, etc.

Some of these risk assessment measures have already been incorporated in the MERS annual valuation reports. For example, the projections of funded percentage and employer contributions shown on the following pages could be used to gauge the risk associated with long term investment rates of return different than the assumed 7.75% annual rate. A history of the municipality's funded percentage as shown in Table 7, could indicate the trend in funded status over time.

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.

The analysis in this section is intended to review the potential volatility of the actuarial valuation results. 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.

Many assumptions are important in determining the required employer contributions. In the table below, we show the impact of varying the Investment Return Assumption. Lower investment returns would result in higher required employer contributions, and vice-versa.

The relative impact of each investment return 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, 2017 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.

	Assumed Future Annual Smoothed Investment Return Assumption			
	Lower Future Annual Returns		**Valuation Assumption**	**Higher Returns**
12/31/2017 Valuation Results	**5.75%**	**6.75%**	**7.75%**	**8.75%**
Accrued Liability	$ 43,078,946	$ 37,944,455	$ 33,740,975	$ 30,270,989
Valuation Assets[1]	$ 21,218,681	$ 21,218,681	$ 21,218,681	$ 21,218,681
Unfunded Accrued Liability	$ 21,860,265	$ 16,725,774	$ 12,522,294	$ 9,052,308
Funded Ratio	49%	56%	63%	70%
Monthly Normal Cost	$ 44,414	$ 28,210	$ 16,366	$ 7,583
Monthly Amortization Payment	$ 107,775	$ 89,974	$ 73,890	$ 56,476
Total Employer Contribution[2,3]	$ 152,189	$ 118,184	$ 90,256	$ 65,543

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

2 If assets exceed accrued liabilities for a division, the division's amortization payment is negative and is used 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.

3 The above total employer contributions for the 5.75%, 6.75% and 8.75% scenarios do not reflect the changes in the employee contribution rates due to the impact of a cap, if any, on employer contributions. Those scenarios are based on the same employee contribution rates as the 7.75% scenario.

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 assumed long-term investment return assumption scenarios. All four projections take into account the past investment losses that will continue to affect the actuarial rate of return in the short term. Under the 7.75% scenarios in the table on the next page, two sets of projections are shown:

- Based on the phase-in over 5 fiscal years (beginning in 2017) of the increased contribution requirements associated with the new actuarial assumptions. This projects your minimum required contribution.
- Based on no phase-in of the increased contribution requirements.

The 7.75% scenarios provide 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 6.75% and 5.75% projections provide an indication of the potential required employer contribution if MERS were to realize annual investment returns of 6.75% and 5.75% over the long-term.

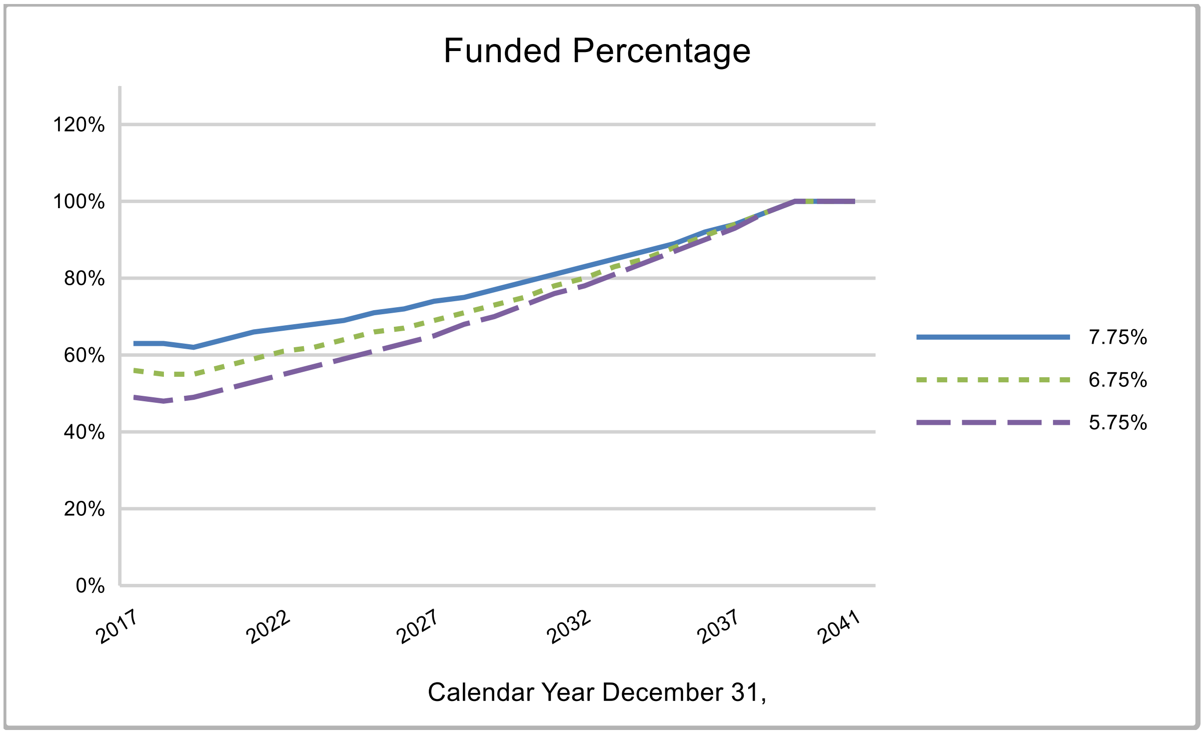
The projections are shown both in tabular and graphical form in total for the employer. The tables show projections for six years. The graphs show projections for twenty five years.

Valuation Year Ending 12/31	Fiscal Year Beginning 1/1	Actuarial Accrued Liability	Valuation Assets[2]	Funded Percentage	Computed Annual Employer Contribution [3]
7.75%[1]					
WITH 5-YEAR PHASE-IN					
2017	2019	$ 33,740,975	$ 21,218,681	63%	$ 1,039,200
2018	2020	34,800,000	21,800,000	63%	1,130,000
2019	2021	35,900,000	22,400,000	62%	1,230,000
2020	2022	37,000,000	23,700,000	64%	1,250,000
2021	2023	38,200,000	25,100,000	66%	1,280,000
2022	2024	39,300,000	26,200,000	67%	1,320,000
NO 5-YEAR PHASE-IN					
2017	2019	$ 33,740,975	$ 21,218,681	63%	$ 1,083,072
2018	2020	34,800,000	21,800,000	63%	1,150,000
2019	2021	35,900,000	22,400,000	62%	1,220,000
2020	2022	37,000,000	23,700,000	64%	1,250,000
2021	2023	38,200,000	25,100,000	66%	1,270,000
2022	2024	39,300,000	26,300,000	67%	1,320,000
6.75%[1]					
NO 5-YEAR PHASE-IN					
2017	2019	$ 37,944,455	$ 21,218,681	56%	$ 1,418,208
2018	2020	39,100,000	21,600,000	55%	1,520,000
2019	2021	40,300,000	22,300,000	55%	1,610,000
2020	2022	41,500,000	23,800,000	57%	1,650,000
2021	2023	42,800,000	25,400,000	59%	1,690,000
2022	2024	44,000,000	26,700,000	61%	1,750,000
5.75%[1]					
NO 5-YEAR PHASE-IN					
2017	2019	$ 43,078,946	$ 21,218,681	49%	$ 1,826,268
2018	2020	44,300,000	21,400,000	48%	1,970,000
2019	2021	45,700,000	22,300,000	49%	2,070,000
2020	2022	47,000,000	24,000,000	51%	2,120,000
2021	2023	48,400,000	25,800,000	53%	2,180,000
2022	2024	49,700,000	27,500,000	55%	2,260,000

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

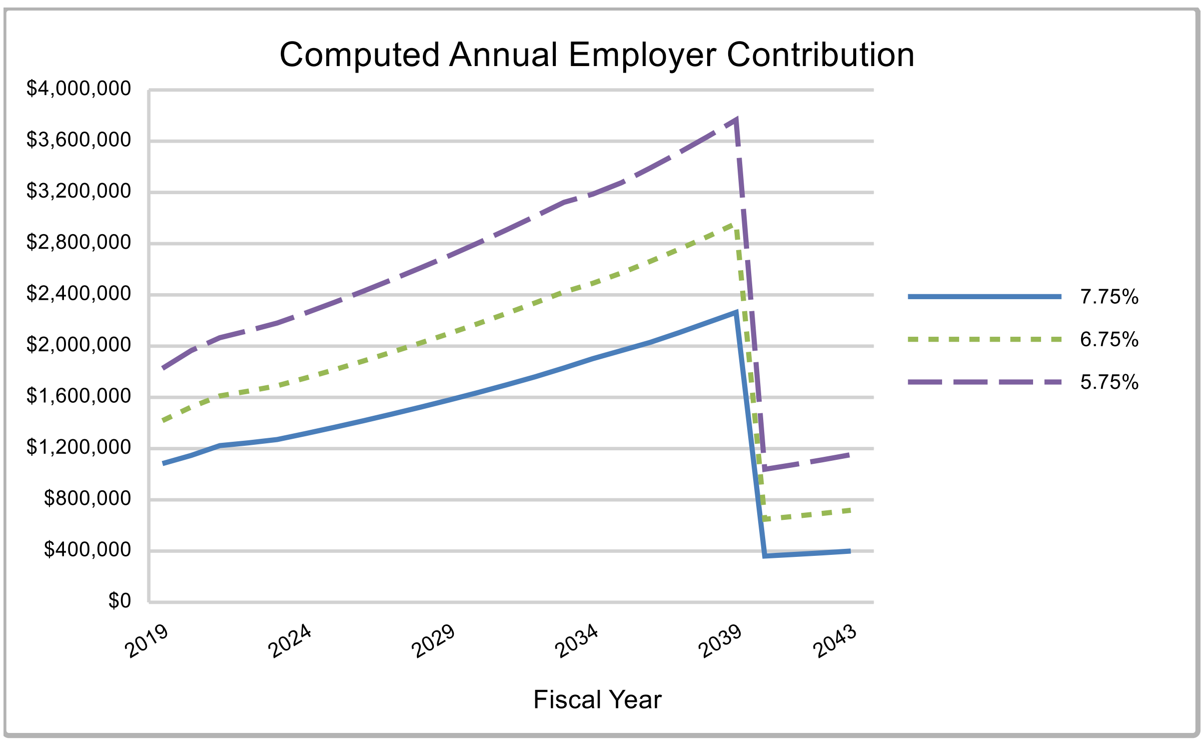
2 Valuation Assets do not include assets from Surplus divisions, if any.

3 The above required annual employer contribution does not reflect future changes in the employee contribution rates due to the impact of a cap, if any, on employer contributions.



Notes:

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



Notes:

All projected contributions are shown with no phase-in.

The above required annual employer contribution does not reflect future changes in the employee contribution rates due to the impact of a cap, if any, on employer contributions.

Employer Contribution Details For the Fiscal Year Beginning January 1, 2019

Table 1

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions[1] Employer Normal Cost	Payment of the Unfunded Accrued Liability[4]	Computed Employer Contribut. No Phase-In	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]
Percentage of Payroll									
01 - Cler Union/Non	12.80%	8.53%	4.27%	4.26%	8.53%	8.53%			0.78%
02 - Plc Officrs	16.64%	10.00%	-	-	-	-	33.45%	32.11%	
05 - IAFF EE Hired aft	13.75%	10.00%	3.75%	-0.18%	3.57%	3.57%			0.74%
20 - Police Chief	16.01%	7.00%	9.01%	-5.01%	4.00%	3.00%			0.42%
21 - Police Command Off	16.45%	10.00%	6.45%	34.49%	40.94%	38.98%			0.78%
22 - Pol Off hired afte	13.11%	10.00%	3.11%	-0.35%	2.76%	2.76%	33.45%	32.11%	0.75%
Estimated Monthly Contribution[3]									
01 - Cler Union/Non			$ 2,949	$ 2,940	$ 5,889	$ 5,889			
02 - Plc Officrs			4,844	49,538	54,382	52,092			
05 - IAFF EE Hired aft			490	(23)	467	467			
20 - Police Chief			881	(490)	391	293			
21 - Police Command Off			4,164	22,265	26,429	25,161			
22 - Pol Off hired afte			3,038	(340)	2,698	2,698			
Total Municipality			**$ 16,366**	**$ 73,890**	**$ 90,256**	**$ 86,600**			
Estimated Annual Contribution[3]			**$ 196,392**	**$ 886,680**	**$ 1,083,072**	**$ 1,039,200**			

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 If projected assets exceed projected liabilities as of the beginning of the January 1, 2019 fiscal year, the negative unfunded accrued liability is treated as overfunding credit and is used to reduce the contribution. This amortization is used to reduce the employer contribution rate. 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).

Note that employer contribution caps are in effect for Division(s): 01. For these divisions the employee contribution rates in Table 1 do **not** reflect phase-in over 5 fiscal years (beginning in 2017) of the increased employee contribution requirements associated with the new actuarial assumptions. The full employee contribution rate without phase-in is shown in Table 1 above. The contribution requirements including the 5-year phase-in are shown on page 7.

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

Benefit Provisions

Table 2

01 - Cler Union/Non: Open Division

	2017 Valuation	2016 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	8.53%	7.47%
Act 88:	No	No

02 - Plc Officrs: Closed to new hires, linked to Division 22

	2017 Valuation	2016 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 and Out	25 and Out
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	10%	10%
Act 88:	No	No

05 - IAFF EE Hired aft 1/1/12: Open Division

	2017 Valuation	2016 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	-
Normal Retirement Age:	60	-
Vesting:	10 years	-
Early Retirement (Unreduced):	55/25	-
Early Retirement (Reduced):	50/25 55/15	-
Final Average Compensation:	3 years	-
Employee Contributions:	10%	-
Act 88:	No	

Table 2 (continued)

20 - Police Chief: Open Division

	2017 Valuation	2016 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 and Out	25 and Out
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	7%	7%
Act 88:	No	No

21 - Police Command Officers: Open Division

	2017 Valuation	2016 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	25 and Out	25 and Out
Early Retirement (Reduced):	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	10%	10%
Act 88:	No	No

22 - Pol Off hired after 1/1/2012: Open Division, linked to Division 02

	2017 Valuation	2016 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	10%	10%
Act 88:	No	No

Note that employer contribution caps are in effect for Division(s): 01. For these divisions the employee contribution rates in Table 2 do **not** reflect phase-in over 5 fiscal years of the increased employee contribution requirements associated with the new actuarial assumptions. The full employee contribution rate without phase-in is shown in Table 2 above. The contribution requirements including the 5-year phase-in are shown on page 7.

Participant Summary

Table 3

Division	2017 Valuation		2016 Valuation		2017 Valuation		
	Number	Annual Payroll[1]	Number	Annual Payroll[1]	Average Age	Average Benefit Service[2]	Average Eligibility Service[2]
01 - Cler Union/Non							
Active Employees	20	$ 769,937	19	$ 692,264	49.9	10.2	11.2
Vested Former Employees	2	18,371	2	18,371	45.7	11.7	18.5
Retirees and Beneficiaries	8	183,639	8	183,252	64.1		
02 - Plc Officrs							
Active Employees	12	$ 851,827	14	$ 991,345	39.0	12.9	13.0
Vested Former Employees	2	31,905	3	67,818	54.1	11.6	11.6
Retirees and Beneficiaries	26	1,112,554	23	969,413	58.1		
05 - IAFF EE Hired aft 1/							
Active Employees	3	$ 145,760		$	36.1	0.3	0.3
Vested Former Employees	0	0			0.0	0.0	0.0
Retirees and Beneficiaries	0	0			0.0		
20 - Police Chief							
Active Employees	1	$ 108,969	1	$ 100,922	55.7	31.8	31.8
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
21 - Police Command Offic							
Active Employees	8	$ 719,663	8	$ 721,921	39.7	13.4	13.5
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	12	586,178	12	573,367	59.2		
22 - Pol Off hired after							
Active Employees	19	$ 1,050,455	15	$ 850,650	28.6	1.8	2.3
Vested Former Employees	1	4,889	1	4,889	32.0	3.1	5.8
Retirees and Beneficiaries	0	0	0	0	0.0		
Total Municipality							
Active Employees	**63**	**$ 3,646,611**	**57**	**$ 3,357,102**	**39.5**	**8.5**	**9.0**
Vested Former Employees	**5**	**55,165**	**6**	**91,078**	**46.3**	**9.9**	**13.2**
Retirees and Beneficiaries	**46**	**1,882,371**	**43**	**1,726,032**	**59.4**		
Total Participants	**114**		**106**				

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

2 Description can be found under Miscellaneous and Technical Assumptions in the Appendix.

Reported Assets (Market Value)

Table 4

Division	2017 Valuation		2016 Valuation	
	Employer and Retiree[1]	Employee[2]	Employer and Retiree[1]	Employee[2]
01 - Cler Union/Non	$ 2,807,028	$ 655,476	$ 2,580,781	$ 588,703
02 - Plc Officrs	8,134,247	1,158,935	7,179,031	1,294,241
05 - IAFF EE Hired aft 1/1/12	1,341	3,644		
20 - Police Chief	880,476	180,945	752,033	170,320
21 - Police Command Officers	6,072,961	730,153	5,542,692	646,803
22 - Pol Off hired after 1/1/2012	123,020	232,928	63,938	145,499
Municipality Total	**$ 18,019,073**	**$ 2,962,081**	**$ 16,118,475**	**$ 2,845,566**
Combined Assets	**$20,981,154**		**$18,964,041**	

[1] Reserve for Employer Contributions and Benefit Payments

[2] Reserve for Employee Contributions

The December 31, 2017 valuation assets (actuarial value of assets) are equal to 1.011321 times the reported market value of assets (compared to 1.077095 as of December 31, 2016). The derivation of valuation assets is described, and detailed calculations of valuation assets are shown, in the Appendix.

Flow of Valuation Assets

Table 5

Year Ended 12/31	Employer Contributions		Employee Contributions	Investment Income (Valuation Assets)	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
	Required	Additional						
2007	$ 293,480		$ 338,665	$ 1,033,827	$ (248,382)	$ 0	$ 0	$ 14,091,471
2008	317,338		363,813	714,564	(289,467)	(3,358)	0	15,194,361
2009	332,933		427,207	899,257	(471,437)	(74,564)	0	16,307,757
2010	353,075		361,322	978,574	(652,498)	(43,827)	11,757	17,316,160
2011	416,282	$ 2,271	267,764	897,488	(983,535)	(3,161)	1	17,913,270
2012	473,065	1,392	261,705	811,358	(1,170,358)	(20,431)	0	18,270,001
2013	563,117	0	277,827	1,097,566	(1,240,528)	(4,433)	0	18,963,550
2014	652,492	0	281,448	1,087,346	(1,396,512)	(3,699)	3,888	19,588,513
2015	698,561	0	283,875	966,002	(1,504,600)	0	0	20,032,351
2016	820,161	0	315,795	1,020,847	(1,660,044)	(103,036)	0	20,426,074
2017	856,887	250,000	331,690	1,217,761	(1,804,406)	(59,325)	0	21,218,681

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 Assets include assets from Surplus divisions, if any.

Actuarial Accrued Liabilities and Valuation Assets
As of December 31, 2017

Table 6

Division	Actuarial Accrued Liability	Valuation Assets[1]	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
01 - Cler Union/Non				
Active Employees	$ 1,958,267	$ 1,474,760	75.3%	$ 483,507
Vested Former Employees	72,339	72,339	100.0%	0
Retirees And Beneficiaries	1,933,553	1,933,553	100.0%	0
Pending Refunds	21,051	21,051	100.0%	0
Total	**$ 3,985,210**	**$ 3,501,703**	**87.9%**	**$ 483,507**
02 - Plc Officrs				
Active Employees	$ 2,893,787	$ 1,007,024	34.8%	$ 1,886,763
Vested Former Employees	246,884	91,737	37.2%	155,147
Retirees And Beneficiaries	14,564,225	8,239,455	56.6%	6,324,770
Pending Refunds	60,174	60,174	100.0%	0
Total	**$ 17,765,070**	**$ 9,398,390**	**52.9%**	**$ 8,366,680**
05 - IAFF EE Hired aft 1/1/12				
Active Employees	$ 2,132	$ 5,041	236.4%	$ (2,909)
Vested Former Employees	0	0	0.0%	0
Retirees And Beneficiaries	0	0	0.0%	0
Pending Refunds	0	0	0.0%	0
Total	**$ 2,132**	**$ 5,041**	**236.4%**	**$ (2,909)**
20 - Police Chief				
Active Employees	$ 1,010,774	$ 1,073,437	106.2%	$ (62,663)
Vested Former Employees	0	0	0.0%	0
Retirees And Beneficiaries	0	0	0.0%	0
Pending Refunds	0	0	0.0%	0
Total	**$ 1,010,774**	**$ 1,073,437**	**106.2%**	**$ (62,663)**
21 - Police Command Officers				
Active Employees	$ 2,681,917	$ 730,153	27.2%	$ 1,951,764
Vested Former Employees	0	0	0.0%	0
Retirees And Beneficiaries	7,972,559	6,149,979	77.1%	1,822,580
Pending Refunds	0	0	0.0%	0
Total	**$ 10,654,476**	**$ 6,880,132**	**64.6%**	**$ 3,774,344**
22 - Pol Off hired after 1/1/2012				
Active Employees	$ 287,410	$ 324,075	112.8%	$ (36,665)
Vested Former Employees	17,931	17,931	100.0%	0
Retirees And Beneficiaries	0	0	0.0%	0
Pending Refunds	17,972	17,972	100.0%	0
Total	**$ 323,313**	**$ 359,978**	**111.3%**	**$ (36,665)**

Table 6 (continued)

Division	Actuarial Accrued Liability	Valuation Assets[1]	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
Total Municipality				
Active Employees	**$ 8,834,287**	**$ 4,614,490**	**52.2%**	**$ 4,219,797**
Vested Former Employees	**337,154**	**182,007**	**54.0%**	**155,147**
Retirees and Beneficiaries	**24,470,337**	**16,322,987**	**66.7%**	**8,147,350**
Pending Refunds	**99,197**	**99,197**	**100.0%**	**0**
Total	**$ 33,740,975**	**$ 21,218,681**	**62.9%**	**$ 12,522,294**
The following results show the combined accrued liabilities and assets for each set of linked divisions. These results are already included in the table above.				
Linked Divisions 22, 02				
Active Employees	$ 3,181,197	$ 1,331,099	41.8%	$ 1,850,098
Vested Former Employees	264,815	109,668	41.4%	155,147
Retirees and Beneficiaries	14,564,225	8,239,455	56.6%	6,324,770
Pending Refunds	78,146	78,146	100.0%	0
Total	**$ 18,088,383**	**$ 9,758,368**	**53.9%**	**$ 8,330,015**

1 Includes both employer and employee assets.

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

Actuarial Accrued Liabilities - Comparative Schedule

Table 7

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2003	$ 11,083,801	$ 9,205,466	83%	$ 1,878,335
2004	13,083,813	10,269,581	78%	2,814,232
2005	14,113,372	11,303,146	80%	2,810,226
2006	15,935,423	12,673,881	80%	3,261,542
2007	17,408,350	14,091,471	81%	3,316,879
2008	18,880,101	15,194,361	80%	3,685,740
2009	20,934,702	16,307,757	78%	4,626,945
2010	22,548,851	17,316,160	77%	5,232,691
2011	24,571,966	17,913,270	73%	6,658,696
2012	25,788,260	18,270,001	71%	7,518,259
2013	26,994,498	18,963,550	70%	8,030,948
2014	28,826,786	19,588,513	68%	9,238,273
2015	31,078,970	20,032,351	65%	11,046,619
2016	32,114,545	20,426,074	64%	11,688,471
2017	33,740,975	21,218,681	63%	12,522,294

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.

Division 01 - Cler Union/Non

Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2007	$ 2,019,551	$ 1,896,484	94%	$ 123,067
2008	2,235,899	2,098,552	94%	137,347
2009	2,262,258	2,332,894	103%	(70,636)
2010	2,489,011	2,608,968	105%	(119,957)
2011	2,810,357	2,797,623	100%	12,734
2012	2,945,518	2,902,881	99%	42,637
2013	3,096,564	3,090,359	100%	6,205
2014	3,382,367	3,220,758	95%	161,609
2015	3,722,406	3,330,360	90%	392,046
2016	3,686,721	3,413,835	93%	272,886
2017	3,985,210	3,501,703	88%	483,507

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		
2007	22	$ 768,727	5.61%	6.45%
2008	23	863,449	5.64%	6.56%
2009	22	835,182	5.18%	5.18%
2010	21	798,054	4.83%	4.83%
2011	19	717,252	5.97%	5.97%
2012	20	760,372	6.06%	6.06%
2013	19	692,328	5.94%	5.94%
2014	18	682,289	6.83%	6.83%
2015	18	666,717	8.26%	8.26%
2016	19	692,264	7.47%	7.47%
2017	20	769,937	8.53%	8.53%

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 6.

See the Benefit Provision History on page 39 for past benefit provision changes.

Division 02 - Plc Officrs

Table 8-02: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2007	$ 15,388,799	$ 12,194,987	79%	$ 3,193,812
2008	16,644,202	13,095,809	79%	3,548,393
2009	18,672,444	13,974,863	75%	4,697,581
2010	13,203,572	9,364,962	71%	3,838,610
2011	13,565,372	8,919,615	66%	4,645,757
2012	13,592,462	8,724,981	64%	4,867,481
2013	14,168,125	8,909,097	63%	5,259,028
2014	15,618,573	9,052,983	58%	6,565,590
2015	16,448,537	9,066,418	55%	7,382,119
2016	16,906,127	9,126,519	54%	7,779,608
2017	17,765,070	9,398,390	53%	8,366,680

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 Number	Active Employees Annual Payroll	Computed Employer Contribution[1]	Employee Contribution Rate[2]
2007	39	$ 2,642,965	7.00%	14.37%
2008	43	2,820,999	7.00%	15.92%
2009	43	2,813,269	9.84%	16.13%
2010	29	1,738,005	17.60%	10.00%
2011	24	1,446,530	$ 29,614	10.00%
2012	23	1,438,661	$ 31,231	10.00%
2013	23	1,458,895	$ 34,400	10.00%
2014	21	1,495,438	$ 42,529	10.00%
2015	17	1,203,340	$ 48,104	10.00%
2016	14	991,345	$ 50,072	10.00%
2017	12	851,827	$ 54,382	10.00%

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 6.

See the Benefit Provision History on page 39 for past benefit provision changes.

Division 05 - IAFF EE Hired aft 1/1/12

Table 8-05: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2017	$ 2,132	$ 5,041	236%	$ (2,909)

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		
2017	3	$ 145,760	3.57%	10.00%

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 6.

See the Benefit Provision History on page 39 for past benefit provision changes.

Division 20 - Police Chief

Table 8-20: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 713,936	$ 579,650	81%	$ 134,286
2011	809,711	650,596	80%	159,115
2012	829,481	710,372	86%	119,109
2013	869,669	782,780	90%	86,889
2014	887,919	853,741	96%	34,178
2015	944,297	921,626	98%	22,671
2016	961,854	993,462	103%	(31,608)
2017	1,010,774	1,073,437	106%	(62,663)

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 Number	Active Employees Annual Payroll	Computed Employer Contribution[1]	Employee Contribution Rate[2]
2010	1	$ 94,987	15.84%	7.00%
2011	1	102,644	17.18%	7.00%
2012	1	100,279	15.68%	7.00%
2013	1	98,982	14.06%	7.00%
2014	1	99,482	10.81%	7.00%
2015	1	98,187	10.42%	7.00%
2016	1	100,922	6.09%	7.00%
2017	1	108,969	4.00%	7.00%

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 6.

See the Benefit Provision History on page 39 for past benefit provision changes.

Division 21 - Police Command Officers

Table 8-21: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2010	$ 6,142,332	$ 4,762,580	78%	$ 1,379,752
2011	7,386,526	5,545,436	75%	1,841,090
2012	8,409,770	5,917,101	70%	2,492,669
2013	8,825,456	6,145,415	70%	2,680,041
2014	8,879,354	6,399,917	72%	2,479,437
2015	9,880,818	6,601,982	67%	3,278,836
2016	10,359,898	6,666,674	64%	3,693,224
2017	10,654,476	6,880,132	65%	3,774,344

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		
2010	7	$ 564,376	18.12%	10.81%
2011	7	572,799	24.02%	10.00%
2012	7	589,549	31.61%	10.00%
2013	7	569,847	35.19%	10.00%
2014	7	589,637	31.83%	10.00%
2015	8	664,078	37.62%	10.00%
2016	8	721,921	39.34%	10.00%
2017	8	719,663	40.94%	10.00%

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 6.

See the Benefit Provision History on page 39 for past benefit provision changes.

Division 22 - Pol Off hired after 1/1/2012

Table 8-22: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2012	11,029	14,666	133%	(3,637)
2013	34,684	35,899	104%	(1,215)
2014	58,573	61,114	104%	(2,541)
2015	82,912	111,965	135%	(29,053)
2016	199,945	225,584	113%	(25,639)
2017	323,313	359,978	111%	(36,665)

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 Number	Active Employees Annual Payroll	Computed Employer Contribution[1]	Employee Contribution Rate[2]
2011	0	$ 0	0.00%	0.00%
2012	3	133,923	2.77%	10.00%
2013	3	150,681	3.11%	10.00%
2014	3	168,238	2.76%	10.00%
2015	9	447,105	2.75%	10.00%
2016	15	850,650	2.84%	10.00%
2017	19	1,050,455	2.76%	10.00%

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 6.

See the Benefit Provision History on page 39 for past benefit provision changes.

Division 01 - Cler Union/Non

Table 10-01: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2019: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 392,046	23	$ 411,999	21	$ 28,956
(Gain)/Loss	12/31/2016	(135,599)	22	(147,090)	21	(10,344)
Plan Amendments	12/31/2016	2,713	22	2,938	21	204
(Gain)/Loss	12/31/2017	221,975	21	239,178	21	16,812
Plan Amendments	12/31/2017	(4,544)	21	(4,896)	21	(348)
Total				**$ 502,129**		**$ 35,280**

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, 2017 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2017 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.

Division 02 - Plc Officrs

Table 10-02: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2019 Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 7,382,119	23	$ 7,623,946	21	$ 535,824
(Gain)/Loss	12/31/2016	271,185	22	294,153	21	20,676
(Gain)/Loss	12/31/2017	501,238	21	540,084	21	37,956
Total				**$ 8,458,183**		**$ 594,456**

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, 2017 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2017 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.

Division 05 - IAFF EE Hired aft 1/1/12

Table 10-05: Layered Amortization Schedule

				Amounts for Fiscal Year Beginning 1/1/2019		
Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2017	$ (2,909)	15	$ (3,134)	15	$ (276)
Total				**$ (3,134)**		**$ (276)**

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, 2017 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2017 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.

Division 20 - Police Chief

Table 10-20: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2019: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2016	$ (33,042)	15	$ (35,073)	14	$ (3,288)
(Gain)/Loss	12/31/2017	(27,060)	15	(29,157)	15	(2,592)
Total				**$ (64,230)**		**$ (5,880)**

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, 2017 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2017 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.

Division 21 - Police Command Officers

Table 10-21: Layered Amortization Schedule

				Amounts for Fiscal Year Beginning 1/1/2019		
Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 3,278,836	23	$ 3,403,533	21	$ 239,208
(Gain)/Loss	12/31/2016	341,246	22	370,149	21	26,016
(Gain)/Loss	12/31/2017	25,748	21	27,743	21	1,956
Total				**$ 3,801,425**		**$ 267,180**

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, 2017 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2017 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.

Division 22 - Pol Off hired after 1/1/2012

Table 10-22: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2019 Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ (29,053)	10	$ (25,590)	10	$ (3,132)
(Gain)/Loss	12/31/2016	2,675	15	2,844	14	264
(Gain)/Loss	12/31/2017	(12,628)	15	(13,607)	15	(1,212)
Total				**$ (36,353)**		**$ (4,080)**

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.

The unfunded accrued liability (UAL) as of December 31, 2017 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2017 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.

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 www.mersofmich.com.

Actuarial Valuation Date:	12/31/2017
Measurement Date of Total Pension Liability (TPL):	12/31/2017

At 12/31/2017, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits:	46
Inactive employees entitled to but not yet receiving benefits:	5
Active employees:	63
	114

Covered employee payroll: (Needed for Required Supplementary Information)	$	3,646,611
Average expected remaining service lives of all employees (active and inactive):		6
Total Pension Liability as of 12/31/2016 measurement date:	$	31,221,673
Total Pension Liability as of 12/31/2017 measurement date:	$	32,812,452
Service Cost for the year ending on the 12/31/2017 measurement date:	$	505,085

Change in the Total Pension Liability due to:

- Benefit changes[1]:	$	(4,623)
- Differences between expected and actual experience[2]:	$	528,422
- Changes in assumptions[2]:	$	0

[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.

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 12/31/2017:	$ 4,002,312	-	$ (3,314,921)

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.

GASB 68 Information

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

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

Actuarial Valuation Date:		12/31/2017
Measurement Date of Total Pension Liability (TPL):		12/31/2018
At 12/31/2017, the following employees were covered by the benefit terms:		
Inactive employees or beneficiaries currently receiving benefits:		46
Inactive employees entitled to but not yet receiving benefits:		5
Active employees:		63
		114
Covered employee payroll: (Needed for Required Supplementary Information)	$	3,646,611
Average expected remaining service lives of all employees (active and inactive):		6
Total Pension Liability as of 12/31/2017 measurement date:	$	32,321,221
Total Pension Liability as of 12/31/2018 measurement date:	$	33,927,309
Service Cost for the year ending on the 12/31/2018 measurement date:	$	522,717
Change in the Total Pension Liability due to:		
- Benefit changes[1]:	$	(2,585)
- Differences between expected and actual experience[2]:	$	533,226
- Changes in assumptions[2]:	$	0

[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.

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:	$ 4,092,497	-	$ (3,391,426)

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 - Cler Union/Non

1/1/2018	Participant Contribution Rate 7.47%
1/1/2017	Participant Contribution Rate 7.4%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2016	Participant Contribution Rate 6.83%
1/1/2015	Member Contribution Rate 5.94%
1/1/2014	Member Contribution Rate 6.06%
1/1/2013	Member Contribution Rate 5.97%
1/1/2012	Member Contribution Rate 4.83%
1/1/2011	Member Contribution Rate 5.18%
1/1/2010	Member Contribution Rate 6.56%
1/1/2009	Member Contribution Rate 6.45%
1/1/2008	Member Contribution Rate 6.91%
1/1/2007	Member Contribution Rate 6.46%
1/1/2006	Member Contribution Rate 6.81%
1/1/2005	Member Contribution Rate 7.00%
1/1/2004	Member Contribution Rate 6.49%
1/1/2003	Member Contribution Rate 6.25%
1/1/2002	Member Contribution Rate 4.15%
7/1/2001	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/2001	10 Year Vesting
7/1/2001	Benefit B-4 (80% max)
7/1/2001	Benefit F55 (With 25 Years of Service)
7/1/2001	Member Contribution Rate 5.50%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
	Fiscal Month - January

02 - Plc Officrs

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2011	Member Contribution Rate 10.00%
1/1/2010	Member Contribution Rate 12.31%
1/1/2009	Member Contribution Rate 11.53%
1/1/2008	Member Contribution Rate 11.23%
1/1/2007	Member Contribution Rate 11.05%
1/1/2006	Member Contribution Rate 10.70%
1/1/2005	Member Contribution Rate 9.99%
1/1/2004	Member Contribution Rate 10.42%
1/1/2003	Member Contribution Rate 8.69%
1/1/2002	Member Contribution Rate 6.68%
1/1/2002	E2 2.5% COLA for future retirees (07/01/2001)

02 - Plc Officrs

7/1/2001	Member Contribution Rate 5.37%
1/1/2001	Member Contribution Rate 3.22%
1/1/2000	Member Contribution Rate 3.05%
3/1/1999	Member Contribution Rate 3.85%
1/1/1999	Member Contribution Rate 5.15%
7/1/1997	Member Contribution Rate 4.69%
4/1/1996	Member Contribution Rate 6.10%
7/1/1994	25 Years & Out
7/1/1994	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/1994	10 Year Vesting
7/1/1994	Benefit B-4 (80% max)
7/1/1994	Member Contribution Rate 0.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
	Fiscal Month - January

05 - IAFF EE Hired aft 1/1/12

9/1/2017	Day of work defined as 100 Hours a Month for All employees.
9/1/2017	Benefit FAC-3 (3 Year Final Average Compensation)
9/1/2017	Non Standard Compensation Definition
9/1/2017	10 Year Vesting
9/1/2017	Defined Benefit Normal Retirement Age - 60
9/1/2017	Service Credit Purchase Estimates - Yes
9/1/2017	Benefit B-4 (80% max)
9/1/2017	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
9/1/2017	Benefit F55 (With 25 Years of Service)
9/1/2017	Participant Contribution Rate 10%
	Fiscal Month - January

20 - Police Chief

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2011	E2 2.5% COLA for future retirees (05/01/2010)
5/1/2010	25 Years & Out
5/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
5/1/2010	10 Year Vesting
5/1/2010	Benefit B-4 (80% max)
5/1/2010	Member Contribution Rate 7.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
	Fiscal Month - January

21 - Police Command Officers

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2011	Member Contribution Rate 10.00%
1/1/2010	Member Contribution Rate 10.81%

21 - Police Command Officers

1/1/2010	E2 2.5% COLA for future retirees (01/01/2009)
1/1/2009	10 Year Vesting
1/1/2009	Benefit B-4 (80% max)
1/1/2009	Member Contribution Rate 10.33%
1/1/2009	25 Years & Out
1/1/2009	Benefit FAC-3 (3 Year Final Average Compensation)
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
	Fiscal Month - January

22 - Pol Off hired after 1/1/2012

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2012	Benefit FAC-3 (3 Year Final Average Compensation)
1/1/2012	10 Year Vesting
1/1/2012	Benefit B-4 (80% max)
1/1/2012	Benefit F55 (With 25 Years of Service)
1/1/2012	Member Contribution Rate 10.00%
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years
	Fiscal Month - January

Plan Provisions, Actuarial Assumptions, and Actuarial Funding Method

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

Increase in Final Average Compensation

Division	FAC Increase Assumption
All Divisions	2.00%

Withdrawal Rate Scaling Factor

Division	Withdrawal Rate Scaling Factor
All Divisions	100%

Miscellaneous and Technical Assumptions

Loads – None.