MUNICIPAL EMPLOYEES' RETIREMENT SYSTEM OF MICHIGAN

ANNUAL ACTUARIAL VALUATION REPORT DECEMBER 31, 2016

OTSEGO CRC (6901)

Spring, 2017

Otsego CRC

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

This report presents the results of the Annual Actuarial Valuation, prepared as of December 31, 2016. The report includes the determination of liabilities and contribution rates resulting from the participation of Otsego CRC (6901) in the Municipal Employees' Retirement System of Michigan ("MERS"). MERS is a nonprofit organization, independent from the State, that has provided retirement plans for municipal employees for 70 years. Otsego CRC 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, 2016 annual actuarial valuation is to:

- Measure funding progress
- Establish contribution requirements for the fiscal year beginning January 1, 2018
- 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, 2016 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-2016AnnualActuarialValuation-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

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Executive Summary

Actuarial Assumptions and Methods Adopted with the December 31, 2015 Valuations

The actuarial assumptions and methods are adopted by the MERS Retirement Board, and are reviewed every five years in an Experience Study. The Experience Study is a comprehensive, detailed analysis that reviews MERS' funding policy and compares actual experience with the current actuarial assumptions; the study recommends adjustments as necessary. The most recent study was completed in 2015 and 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 report continues to provide contributions both with and without the phase-in adjustments.

The assumptions and methods are described in the Appendix on the MERS website.

As part of the recent Experience Study, the following changes are first reflected in the December 31, 2016 annual valuation:

- The asset smoothing was changed from 10 to 5 years. The gain (loss) recognized each year will be 20% of the current year's gain (loss) plus 20% of the gain (loss) from each of the 4 preceding years. The cumulative difference between the market value and valuation assets as of December 31, 2015 will be recognized over 4 years.
- Annual changes in Unfunded Accrued Liability (UAL) will be amortized over fixed periods, creating "layers" of UAL. This will require removing and creating "layers" of UAL on an annual basis.
    - Once the amortization period drops below 15 years (10 years for closed divisions), any future liability and asset gains or losses will be spread over a 15-year fixed period for open divisions and a 10-year fixed period for closed divisions — creating "layers" of UAL on an annual basis.
    - This transparent method allows tracking of what changed your UAL, and sets a fixed period in time in which that UAL change will be fully funded.

MERS created a dedicated resource page on their website for additional information on these topics (http://www.mersofmich.com/Employer/Work-Scenarios/Unfunded-Liability).

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:

	12/31/2016	12/31/2015
Funded Ratio	56%	58%

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 second 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 2017 your municipality is making employer contributions based on rates without the phase-in applied, contact MERS to ensure this rate is used again for 2018 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:	12/31/2016	12/31/2016	12/31/2015	12/31/2015	12/31/2016	12/31/2016	12/31/2015	12/31/2015
Fiscal Year Beginning:	January 1, 2018	January 1, 2018	January 1, 2017	January 1, 2017	January 1, 2018	January 1, 2018	January 1, 2017	January 1, 2017
Division								
01 - General	-	-	-	-	$ 24,904	$ 26,821	$ 20,492	$ 23,108
10 - General after 10/16/20	3.29%	3.34%	5.03%	5.12%	835	847	885	901
11 - Non-Union employees	32.90%	35.22%	36.77%	41.03%	13,465	14,413	11,154	12,446
Municipality Total					**$ 39,204**	**$ 42,081**	**$ 32,531**	**$ 36,455**

Employee contribution rates reflected in the valuations are shown below:

	Employee Contribution Rate	
Valuation Date:	12/31/2016	12/31/2015
Division		
01 - General	3.50%	2.50%
10 - General after 10/16/20	3.50%	2.50%
11 - Non-Union employees	3.50%	2.50%

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. **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 entire employer would be $ 66,914, instead of $ 42,081.
- To accelerate to a 100% funding ratio in 20 years, estimated monthly employer contributions for the entire employer would be $ 44,173, instead of $ 42,081.

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 Asset Smoothing

The actuarial value of assets, used to determine both your funded ratio and your required employer contribution, is based on a smoothed value of assets (10-year smoothing prior to 2016; 5-year smoothing beginning in 2016). A smoothing method reduces the volatility of the valuation results, which affects your required employer contribution and funded ratio. The smoothed actuarial rate of return for 2016 was 5.14%.

As of December 31, 2016 the actuarial value of assets is 108% of market value. 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.

If the December 31, 2016 valuation results were based on market value on that date instead of smoothed funding value: i) the funded percent of your entire municipality would be 52% (instead of 56%); and ii) your total employer contribution requirement for the fiscal year starting January 1, 2018 would be $ 541,020 (instead of $ 504,972).

The asset smoothing method is a powerful tool for reducing the volatility of your required employer contributions. **However, if the current 8% difference between the smoothed value and the market value of assets is not made up, the result would be gradual increases in your employer contribution requirement over the next few years (to around the levels described above).**

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. Risk may be managed through a plan design that provides benefits that are sustainable in the long run. An Experience Study is completed every five years to review the assumptions and methods. The next Experience Study will be completed in 2020.

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 one actuarial assumption: the future annual rate of investment return. 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, 2016 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 Rate of Investment Return			
	Lower Future Annual Returns		Valuation Assumption	Higher Returns
12/31/2016 Valuation Results	**5.75%**	**6.75%**	**7.75%**	**8.75%**
Accrued Liability	$ 15,145,884	$ 13,564,991	$ 12,227,243	$ 11,087,549
Valuation Assets	$ 6,820,832	$ 6,820,832	$ 6,820,832	$ 6,820,832
Unfunded Accrued Liability	$ 8,325,052	$ 6,744,159	$ 5,406,411	$ 4,266,717
Funded Ratio	45%	50%	56%	62%
Monthly Normal Cost	$ 20,122	$ 14,950	$ 10,977	$ 7,921
Monthly Amortization Payment	$ 40,634	$ 35,894	$ 31,104	$ 26,278
Total Employer Contribution[1]	$ 60,756	$ 50,844	$ 42,081	$ 34,199

[1] 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.

Projection Scenarios

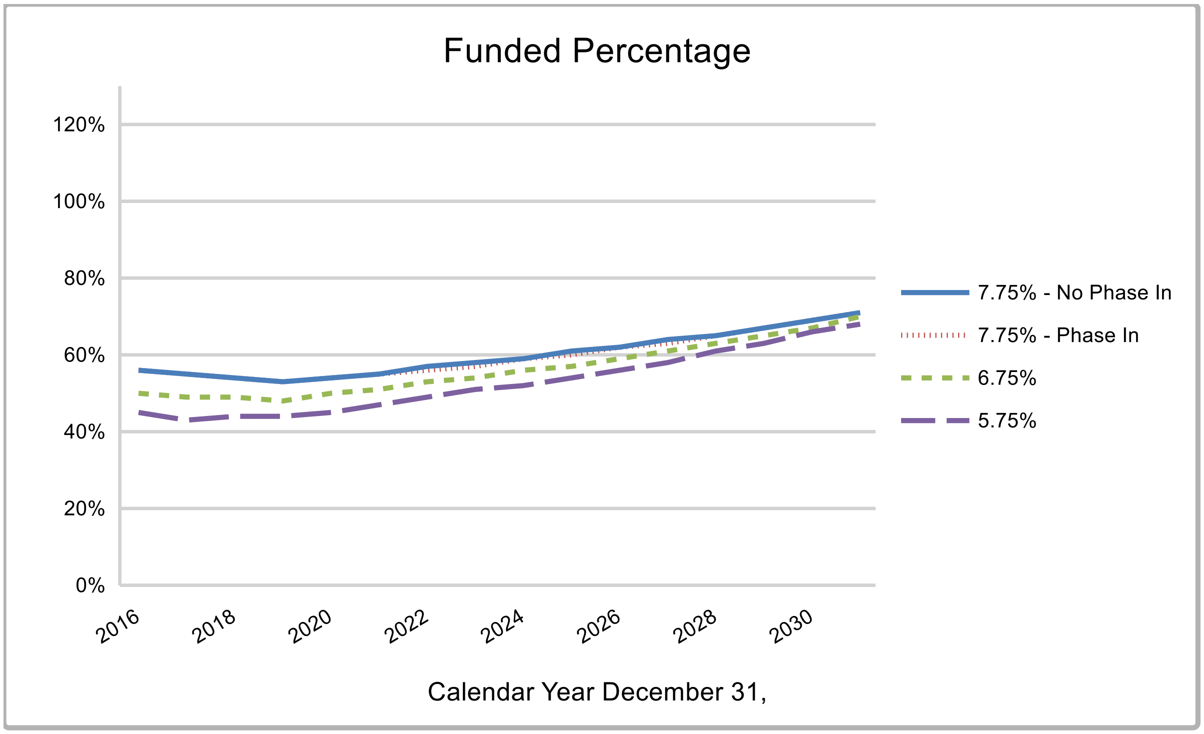
The next two pages show projections of the plan's funded ratio and computed employer contributions under the actuarial assumptions used in the valuation and alternate assumed long-term investment return scenarios. All four projections take into account the past investment losses that will continue to affect the smoothed rate of return in the short term. Under the 7.75% scenarios, two sets of projections are shown:

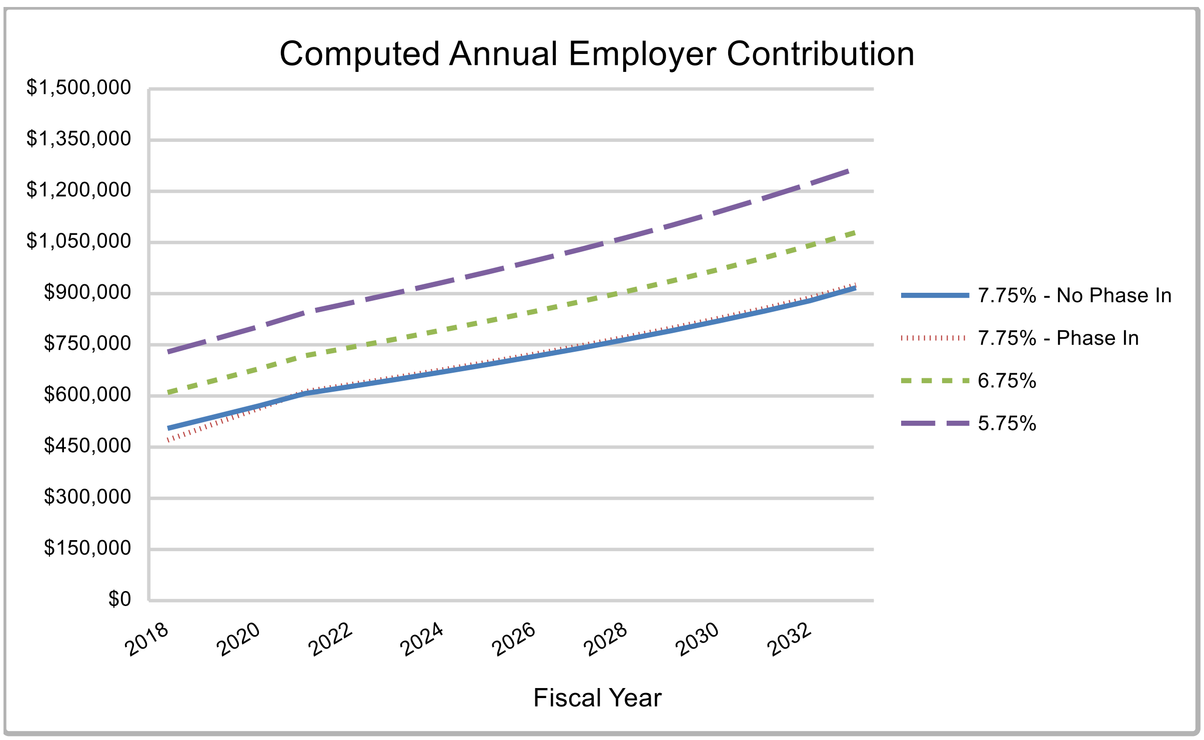
- Based on the phase-in over 5 fiscal years (beginning in 2017) of the increased contribution requirements associated with the new actuarial assumptions. This projects your minimum required contribution.
- Based on no phase-in of the increased contribution requirements.

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 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 fifteen years.

Valuation Year Ending 12/31	Fiscal Year Beginning 1/1	Actuarial Accrued Liability	Valuation Assets	Funded Percentage	Computed Annual Employer Contribution
7.75% Assumed Interest Discount Rate and Future Annual Market Rate of Return					
WITH 5-YEAR PHASE-IN					
2016	2018	$ 12,227,243	$ 6,820,832	56%	$ 470,448
2017	2019	12,500,000	6,840,000	55%	518,000
2018	2020	12,900,000	6,890,000	54%	564,000
2019	2021	13,200,000	6,960,000	53%	613,000
2020	2022	13,500,000	7,260,000	54%	634,000
2021	2023	13,900,000	7,620,000	55%	655,000
NO 5-YEAR PHASE-IN					
2016	2018	$ 12,227,243	$ 6,820,832	56%	$ 504,972
2017	2019	12,500,000	6,840,000	55%	538,000
2018	2020	12,900,000	6,930,000	54%	571,000
2019	2021	13,200,000	7,020,000	53%	607,000
2020	2022	13,500,000	7,340,000	54%	628,000
2021	2023	13,900,000	7,690,000	55%	649,000
6.75% Assumed Interest Discount Rate and Future Annual Market Rate of Return					
NO 5-YEAR PHASE-IN					
2016	2018	$ 13,564,991	$ 6,820,832	50%	$ 610,128
2017	2019	13,900,000	6,780,000	49%	645,000
2018	2020	14,200,000	6,910,000	49%	680,000
2019	2021	14,600,000	7,040,000	48%	718,000
2020	2022	15,000,000	7,400,000	50%	743,000
2021	2023	15,300,000	7,810,000	51%	767,000
5.75% Assumed Interest Discount Rate and Future Annual Market Rate of Return					
NO 5-YEAR PHASE-IN					
2016	2018	$ 15,145,884	$ 6,820,832	45%	$ 729,072
2017	2019	15,500,000	6,710,000	43%	766,000
2018	2020	15,900,000	6,900,000	44%	804,000
2019	2021	16,200,000	7,090,000	44%	844,000
2020	2022	16,600,000	7,520,000	45%	873,000
2021	2023	17,000,000	7,980,000	47%	903,000


Funded Percentage
120%
100%
80%
60%
40%
20%
0%
2016
2018
2020
2022
2024
2026
2028
2030
Calendar Year December 31,
7.75% - No Phase In
7.75% - Phase In
6.75%
5.75%


Computed Annual Employer Contribution
$1,500,000
$1,350,000
$1,200,000
$1,050,000
$900,000
$750,000
$600,000
$450,000
$300,000
$150,000
$0
2018
2020
2022
2024
2026
2028
2030
2032
Fiscal Year
7.75% - No Phase In
7.75% - Phase In
6.75%
5.75%

Employer Contribution Details For the Fiscal Year Beginning January 1, 2018

Table 1

Division	Employer Contributions[1] 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. Rate	Employee Contribut. Conversion Factor[2]
Percentage of Payroll								
01 - General	-	-	-	-	27.53%	25.61%	3.50%	
10 - General after 10/1	4.62%	-1.28%	3.34%	3.29%	27.53%	25.61%	3.50%	0.83%
11 - Non-Union employee	9.88%	25.34%	35.22%	32.90%			3.50%	0.89%
Estimated Monthly Contribution[3]								
01 - General	$ 5,763	$ 21,058	$ 26,821	$ 24,904				
10 - General after 10/1	1,171	(324)	847	835				
11 - Non-Union employee	4,043	10,370	14,413	13,465				
Total Municipality	**$ 10,977**	**$ 31,104**	**$ 42,081**	**$ 39,204**				
Estimated Annual Contribution[3]	**$ 131,724**	**$ 373,248**	**$ 504,972**	**$ 470,448**				

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 (ie 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, 2018 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 800-767-2308.

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

Benefit Provisions

Table 2

01 - General: Closed to new hires, linked to Division 10

	2016 Valuation	2015 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:	3.50%	2.50%
Act 88:	Yes (Adopted 11/23/1970)	Yes (Adopted 11/23/1970)

10 - General after 10/16/2012: Open Division, linked to Division 01

	2016 Valuation	2015 Valuation
Benefit Multiplier:	2.00% Multiplier (no max)	2.00% Multiplier (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	3.50%	2.50%
Act 88:	Yes (Adopted 11/23/1970)	Yes (Adopted 11/23/1970)

11 - Non-Union employees: Open Division

	2016 Valuation	2015 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:	3.50%	2.50%
Act 88:	Yes (Adopted 11/23/1970)	Yes (Adopted 11/23/1970)

Participant Summary

Table 3

Division	2016 Valuation Number	2016 Valuation Annual Payroll[1]	2015 Valuation Number	2015 Valuation Annual Payroll[1]	2016 Valuation Average Age	Average Benefit Service[2]	Average Eligibility Service[2]
01 - General							
Active Employees	20	$ 903,489	19	$ 781,328	48.3	15.8	15.8
Vested Former Employees	3	25,010	4	36,722	50.7	10.6	10.6
Retirees and Beneficiaries	36	557,801	36	556,622	73.6		
10 - General after 10/16/							
Active Employees	5	$ 216,756	4	$ 136,814	32.6	1.9	1.9
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
11 - Non-Union employees							
Active Employees	8	$ 456,246	6	$ 338,165	50.1	10.9	13.1
Vested Former Employees	2	38,615	2	38,615	52.6	14.0	14.9
Retirees and Beneficiaries	13	234,384	13	234,384	68.9		
Total Municipality							
Active Employees	**33**	**$ 1,576,491**	**29**	**$ 1,256,307**	**46.4**	**12.5**	**13.0**
Vested Former Employees	**5**	**63,625**	**6**	**75,337**	**51.5**	**12.0**	**12.3**
Retirees and Beneficiaries	**49**	**792,185**	**49**	**791,006**	**72.4**		
Total Participants	**87**		**84**				

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	2016 Valuation		2015 Valuation	
	Employer and Retiree[1]	Employee[2]	Employer and Retiree[1]	Employee[2]
01 - General	$ 4,244,997	$ 57,290	$ 4,045,412	$ 34,787
10 - General after 10/16/2012	67,117	7,754	12,740	2,655
11 - Non-Union employees	1,873,095	82,366	1,762,420	70,453
Municipality Total	**$ 6,185,209**	**$ 147,410**	**$ 5,820,572**	**$ 107,895**
Combined Reserves	**$ 6,332,619**		**$ 5,928,467**	

[1] Reserve for Employer Contributions and Benefit Payments

[2] Reserve for Employee Contributions

The December 31, 2016 valuation assets are equal to 1.077095 times the reported market value of assets (compared to 1.135382 as of December 31, 2015). 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 Required	Employer Contributions Additional	Employee Contributions	Investment Income	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
2006	$ 219,486		$ 0	$ 476,626	$ (345,444)	$ 0	$ 0	$ 6,281,809
2007	224,003		0	510,079	(427,009)	0	0	6,588,882
2008	213,426		0	271,778	(480,497)	0	0	6,593,589
2009	248,246		0	237,106	(537,178)	0	0	6,541,763
2010	258,856		0	276,166	(657,354)	0	0	6,419,431
2011	314,852	$ 70,000	0	288,406	(712,669)	0	0	6,380,020
2012	318,244	120,000	1,167	264,987	(715,449)	0	0	6,368,969
2013	297,129	123,077	15,965	357,620	(716,526)	0	0	6,446,234
2014	327,449	129,967	19,228	360,894	(716,135)	0	0	6,567,637
2015	377,216	121,576	20,794	326,468	(738,956)	0	56,340	6,731,075
2016	388,482	120,000	39,016	334,583	(792,324)	0	0	6,820,832

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.

In the actuarial valuation additional employer contributions are combined with required contributions and used to reduce computed future required employer contributions.

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

Actuarial Accrued Liabilities and Valuation Assets
As of December 31, 2016

Table 6

Division	Actuarial Accrued Liability	Valuation Assets[1]	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
01 - General				
Active Employees	$ 2,982,412	$ 57,290	1.9%	$ 2,925,122
Vested Former Employees	129,055	0	0.0%	129,055
Retirees And Beneficiaries	5,165,381	4,576,682	88.6%	588,699
Pending Refunds	0	0	0.0%	0
Total	**$ 8,276,848**	**$ 4,633,972**	**56.0%**	**$ 3,642,876**
10 - General after 10/16/2012				
Active Employees	$ 40,930	$ 80,643	197.0%	$ (39,713)
Vested Former Employees	0	0	0.0%	0
Retirees And Beneficiaries	0	0	0.0%	0
Pending Refunds	0	0	0.0%	0
Total	**$ 40,930**	**$ 80,643**	**197.0%**	**$ (39,713)**
11 - Non-Union employees				
Active Employees	$ 1,154,489	$ 79,411	6.9%	$ 1,075,078
Vested Former Employees	253,663	2,716	1.1%	250,947
Retirees And Beneficiaries	2,501,074	2,023,851	80.9%	477,223
Pending Refunds	239	239	100.0%	0
Total	**$ 3,909,465**	**$ 2,106,217**	**53.9%**	**$ 1,803,248**
Total Municipality				
Active Employees	**$ 4,177,831**	**$ 217,344**	**5.2%**	**$ 3,960,487**
Vested Former Employees	**382,718**	**2,716**	**0.7%**	**380,002**
Retirees and Beneficiaries	**7,666,455**	**6,600,533**	**86.1%**	**1,065,922**
Pending Refunds	**239**	**239**	**100.0%**	**0**
Total Participants	**$ 12,227,243**	**$ 6,820,832**	**55.8%**	**$ 5,406,411**
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 10, 01				
Active Employees	$ 3,023,342	$ 137,933	4.6%	$ 2,885,409
Vested Former Employees	129,055	0	0.0%	129,055
Retirees and Beneficiaries	5,165,381	4,576,682	88.6%	588,699
Pending Refunds	0	0	0.0%	0
Total	**$ 8,317,778**	**$ 4,714,615**	**56.7%**	**$ 3,603,163**

[1] Includes both employer and employee assets.

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

See Section 46 of the Plan Document for MERS Fiscal Responsibility policy, on the MERS website at: https://employerportal.mersofmich.com/SharePointFormsService/Default.aspx?Publication=MERSPlanDocument.pdf.

Actuarial Accrued Liabilities - Comparative Schedule

Table 7

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2002	$ 6,320,484	$ 5,304,571	84%	$ 1,015,913
2003	6,783,459	5,493,694	81%	1,289,765
2004	7,209,588	5,706,795	79%	1,502,793
2005	7,422,771	5,931,141	80%	1,491,630
2006	7,649,844	6,281,809	82%	1,368,035
2007	8,539,999	6,588,882	77%	1,951,117
2008	8,917,923	6,593,589	74%	2,324,334
2009	9,253,348	6,541,763	71%	2,711,585
2010	9,550,340	6,419,431	67%	3,130,909
2011	10,032,901	6,380,020	64%	3,652,881
2012	10,240,166	6,368,969	62%	3,871,197
2013	10,612,828	6,446,234	61%	4,166,594
2014	10,689,921	6,567,637	61%	4,122,284
2015	11,530,201	6,731,075	58%	4,799,126
2016	12,227,243	6,820,832	56%	5,406,411

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

Division 01 - General

Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2006	$ 7,649,844	$ 6,281,809	82%	$ 1,368,035
2007	8,539,999	6,588,882	77%	1,951,117
2008	8,917,923	6,593,589	74%	2,324,334
2009	9,253,348	6,541,763	71%	2,711,585
2010	9,550,340	6,419,431	67%	3,130,909
2011	10,032,901	6,380,020	64%	3,652,881
2012	10,240,365	6,368,699	62%	3,871,666
2013	10,609,990	6,442,511	61%	4,167,479
2014	7,245,030	4,540,879	63%	2,704,151
2015	7,761,452	4,632,585	60%	3,128,867
2016	8,276,848	4,633,972	56%	3,642,876

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	Active Employees		Computed Employer	Employee Contribution
December 31	Number	Annual Payroll	Contribution[1]	Rate[2]
2006	43	$ 1,608,666	12.96%	0.00%
2007	38	1,402,311	17.03%	0.00%
2008	35	1,360,494	18.85%	0.00%
2009	34	1,365,098	20.59%	0.00%
2010	31	1,198,321	24.05%	0.00%
2011	31	1,285,741	25.61%	0.00%
2012	30	1,336,430	$ 29,156	1.00%
2013	29	1,363,276	$ 31,164	1.25%
2014	22	975,961	$ 20,270	1.50%
2015	19	781,328	$ 23,108	2.50%
2016	20	903,489	$ 26,821	3.50%

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

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

Note: The contributions shown in Table 9 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 7.

See the Benefit Provision History on page 30 for past benefit provision changes.

Division 10 - General after 10/16/2012

Table 8-10: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2012	$ (199)	$ 270	0%	$ (469)
2013	2,838	3,723	131%	(885)
2014	9,066	7,490	83%	1,576
2015	17,278	17,479	101%	(201)
2016	40,930	80,643	197%	(39,713)

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		
2012	1	$ 33,158	6.32%	1.00%
2013	1	36,508	5.97%	1.25%
2014	2	70,930	5.94%	1.50%
2015	4	136,814	5.12%	2.50%
2016	5	216,756	3.34%	3.50%

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

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

Note: The contributions shown in Table 9 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 7.

See the Benefit Provision History on page 30 for past benefit provision changes.

Division 11 - Non-Union employees

Table 8-11: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2014	$ 3,435,825	$ 2,019,268	59%	$ 1,416,557
2015	3,751,471	2,081,011	56%	1,670,460
2016	3,909,465	2,106,217	54%	1,803,248

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

Table 9-11: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2014	7	$ 362,782	32.73%	1.50%
2015	6	338,165	41.03%	2.50%
2016	8	456,246	35.22%	3.50%

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

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

Note: The contributions shown in Table 9 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 7.

See the Benefit Provision History on page 30 for past benefit provision changes.

Division 01 - General

Table 10-01: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance	Original Amortization Period**	Amounts for Fiscal Year Beginning 1/1/2018: Outstanding UAL Balance*	Amortization Period**	Amortization Payment
Initial	12/31/2015	$ 3,128,867	23	$ 3,215,982	22	$ 219,312
Gain/Loss	12/31/2016	464,505	22	500,504	22	34,128
Plan Amendments	12/31/2016	(10,089)	22	(10,871)	22	(744)
Total				**$ 3,705,615**		**$ 252,696**

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

** Please see the Appendix on the MERS website for a description of the amortization policy.

The unfunded accrued liability as of December 31, 2016 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2016 valuation to take into account the expected future contributions that are based on past valuations. The projected unfunded accrued liability is amortized over the appropriate period.

Division 10 - General after 10/16/2012

Table 10-10: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance	Original Amortiza-tion Period**	Amounts for Fiscal Year Beginning 1/1/2018		
				Outstanding UAL Balance*	Amortiza-tion Period**	Amortization Payment
Initial	12/31/2015	$ (201)	10	$ (1,397)	10	$ (168)
Gain/Loss	12/31/2016	(36,595)	15	(39,431)	15	(3,504)
Plan Amendments	12/31/2016	(1,659)	10	(1,788)	10	(216)
Total				**$ (42,616)**		**$ (3,888)**

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

** Please see the Appendix on the MERS website for a description of the amortization policy.

The unfunded accrued liability as of December 31, 2016 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2016 valuation to take into account the expected future contributions that are based on past valuations. The projected unfunded accrued liability is amortized over the appropriate period.

Division 11 - Non-Union employees

Table 10-11: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance	Original Amortization Period**	Amounts for Fiscal Year Beginning 1/1/2018: Outstanding UAL Balance*	Amortization Period**	Amortization Payment
Initial	12/31/2015	$ 1,670,460	23	$ 1,731,116	22	$ 118,056
Gain/Loss	12/31/2016	87,581	22	94,368	22	6,432
Plan Amendments	12/31/2016	(628)	22	(677)	22	(48)
Total				**$ 1,824,807**		**$ 124,440**

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

** Please see the Appendix on the MERS website for a description of the amortization policy.

The unfunded accrued liability as of December 31, 2016 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2016 valuation to take into account the expected future contributions that are based on past valuations. The projected unfunded accrued liability is amortized over the appropriate period.

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:	12/31/2016
Measurement Date of Total Pension Liability (TPL):	12/31/2016

At 12/31/2016, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits:	49
Inactive employees entitled to but not yet receiving benefits:	5
Active employees:	33
	87

Total Pension Liability as of 12/31/2015 measurement date:	$	11,249,020
Total Pension Liability as of 12/31/2016 measurement date:	$	11,925,335
Service Cost for the year ending on the 12/31/2016 measurement date:	$	162,180

Change in the Total Pension Liability due to:

- Benefit changes[1]:	$	(12,383)
- Differences between expected and actual experience[2]:	$	444,126
- 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.

Average expected remaining service lives of all employees (active and inactive):		4
Covered employee payroll: (Needed for Required Supplementary Information)	$	1,576,491

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 12/31/2016:	$ 1,284,357	-	$ (1,096,155)

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:		12/31/2016
Measurement Date of Total Pension Liability (TPL):		12/31/2017
At 12/31/2016, the following employees were covered by the benefit terms:		
Inactive employees or beneficiaries currently receiving benefits:		49
Inactive employees entitled to but not yet receiving benefits:		5
Active employees:		33
		87
Total Pension Liability as of 12/31/2016 measurement date:	$	11,457,463
Total Pension Liability as of 12/31/2017 measurement date:	$	12,227,596
Service Cost for the year ending on the 12/31/2017 measurement date:	$	171,132
Change in the Total Pension Liability due to:		
- Benefit changes[1]:	$	(10,166)
- Differences between expected and actual experience[2]:	$	518,676
- 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.

Average expected remaining service lives of all employees (active and inactive):		4
Covered employee payroll: (Needed for Required Supplementary Information)	$	1,576,491

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:	$ 1,302,202	-	$ (1,113,104)

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 - General

1/1/2017	Participant Contribution Rate 3.5%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2016	Participant Contribution Rate 2.5%
6/1/2014	Member Contribution Rate 1.50%
7/1/2013	Member Contribution Rate 1.25%
12/1/2012	Member Contribution Rate 1.00%
2/1/2007	Benefit B-4 (80% max)
1/1/2004	Benefit F55 (With 25 Years of Service)
4/1/2002	Benefit B-3 (80% max)
1/1/2000	Benefit B-2
6/7/1999	Day of work defined as 8 Hours a Day for All employees.
4/1/1990	Benefit F55 (With 30 Years of Service)
1/1/1988	Flexible E 2% COLA Adopted (01/01/1988)
1/1/1986	Benefit B-1
2/1/1981	Member Contribution Rate 0.00%
5/21/1975	Exclude Temporary Employees
2/1/1971	Benefit C-1 (Old)
11/23/1970	Covered by Act 88
7/1/1959	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/1959	10 Year Vesting
7/1/1959	Benefit C (Old)
7/1/1959	Member Contribution Rate 3.00% Under $4,200.00 - Then 5.00%
7/1/1959	Fiscal Month - January

10 - General after 10/16/2012

1/1/2017	Participant Contribution Rate 3.5%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2016	Participant Contribution Rate 2.5%
6/1/2014	Member Contribution Rate 1.50%
7/1/2013	Member Contribution Rate 1.25%
12/1/2012	Member Contribution Rate 1.00%
11/1/2012	Day of work defined as 8 Hours a Day for All employees.
11/1/2012	Benefit FAC-5 (5 Year Final Average Compensation)
11/1/2012	Non Standard Compensation Definition
11/1/2012	10 Year Vesting
11/1/2012	Benefit B-2
11/1/2012	Member Contribution Rate 0.00%
11/23/1970	Covered by Act 88
7/1/1959	Fiscal Month - January

11 - Non-Union employees

1/1/2017	Participant Contribution Rate 3.5%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2016	Participant Contribution Rate 2.5%
7/1/2014	Day of work defined as 8 Hours a Day for All employees.
7/1/2014	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/2014	Exclude Temporary Employees requiring less than 12 months
7/1/2014	10 Year Vesting
7/1/2014	Benefit B-4 (80% max)
7/1/2014	Benefit F55 (With 25 Years of Service)
7/1/2014	Member Contribution Rate 1.50%
11/23/1970	Covered by Act 88
7/1/1959	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	3.00%

Withdrawal Rate Scaling Factor

Division	Withdrawal Rate Scaling Factor
All Divisions	100%

Miscellaneous and Technical Assumptions

Loads – None.