Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report
December 31, 2018 - Oscoda Co (6801)

GRS Retirement Consulting

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Spring, 2019

Oscoda Co

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

This report presents the results of the Annual Actuarial Valuation, prepared for Oscoda Co (6801) as of December 31, 2018. The report includes the determination of liabilities and contribution rates resulting from the participation in the Municipal Employees' Retirement System of Michigan ("MERS"). This report contains the minimum actuarially determined contribution requirement, in alignment with the MERS Plan Document, Actuarial Policy, and the Michigan Constitution and governing statutes. Oscoda Co is responsible for the employer contributions needed to provide MERS benefits for its employees and former employees.

The purposes of this valuation are to:

- Measure funding progress as of December 31, 2018,
- Establish contribution requirements for the fiscal year beginning January 1, 2020,
- Provide information regarding the identification and assessment of risk,
- Provide actuarial information in connection with applicable Governmental Accounting Standards Board (GASB) statements, and
- Provide information to assist the local unit of government with state reporting requirements.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through December 31, 2018. The valuation was based upon information furnished by MERS concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by MERS.

The Municipal Employees' Retirement Act, PA 427 of 1984 and the MERS' Plan Document Article VI sec. 71 (1)(d), provides the MERS Board with the authority to set actuarial assumptions and methods after consultation with the actuary. As the fiduciary of the plan, MERS Retirement Board sets certain assumptions for funding and GASB purposes. These assumptions are checked regularly through a comprehensive study, called an Experience Study. The most recent study was completed in 2015, as prepared by the prior actuary, and is the basis of the assumptions and methods currently in place. **At the February 28, 2019 board meeting, the MERS Retirement Board adopted new economic assumptions effective with the December 31, 2019 annual actuarial valuation, which will impact contributions beginning in 2021.** An illustration of the potential impact is found in this report.

The Michigan Department of Treasury provides required assumptions to be used for purposes of Public Act 202 reporting. These assumptions are for reporting purposes only and do not impact required contributions. Please refer to the State Reporting page found at the end of this report for information for this filing.

For a full list of all the assumptions used, please refer to the division-specific assumptions described in table(s) in this report, and to the Appendix on the MERS website at:
http://www.mersofmich.com/Portals/0/Assets/Resources/AAV-Appendix/MERS-2018AnnualActuarialValuation-Appendix.pdf.

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

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of Oscoda Co as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and with applicable statutes.

David T. Kausch, Rebecca L. Stouffer, and Mark Buis are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor. GRS maintains independent consulting agreements with certain local units of government for services unrelated to the actuarial consulting services provided in this report.

The Retirement Board of the Municipal Employees' Retirement System of Michigan confirms that the System provides for payment of the required employer contribution as described in Section 20m of Act No. 314 of 1965 (MCL 38.1140m).

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

This report was prepared at the request of the MERS Retirement Board and may be provided only in its entirety by the municipality to other interested parties (MERS customarily provides the full report on request to associated third parties such as the auditor for the municipality). GRS is not responsible for the consequences of any unauthorized use. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

If you have reason to believe that the plan provisions are incorrectly described, that important plan provisions relevant to this valuation are not described, that conditions have changed since the calculations were made, that the information provided in this report is inaccurate or is in anyway incomplete, or if you need further information in order to make an informed decision on the subject matter in this report, please contact your Regional Manager at 1.800.767.MERS (6377).

Sincerely,

David T Kausch

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

Rebecca L. Stouffer

Rebecca L. Stouffer, ASA, FCA, MAAA

Mark Buis

Mark Buis, FSA, FCA, EA, MAAA

Table of Contents

Executive Summary

Funded Ratio

The funded ratio of a plan is the percentage of the dollar value of the actuarial accrued liability that is covered by the actuarial value of assets. While funding ratio may be a useful plan measurement, understanding a plan's funding trend may be more important than a particular point in time. Refer to Table 7 to find a history of this information.

	12/31/2018	12/31/2017
Funded Ratio*	69%	69%

* Reflects assets from Surplus divisions, if any.

There has been a change in actuary and actuarial software since the December 31, 2017 valuation. Throughout this report are references to valuation results generated prior to the 2018 valuation date. Results prior to 2018 were received directly from the prior actuary or extracted from the previous valuation system by MERS's technology service provider.

Required Employer Contributions:

Your required employer contributions are shown in the following table. Employee contributions, if any, are in addition to the employer contributions. Changes to the actuarial assumptions and methods based on the 2015 Experience Study are phased-in over a 5-year period. This valuation reflects the fourth year of the phase-in.

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

	Percentage of Payroll				Monthly $ Based on Projected Payroll			
	Phase-in	No Phase-in	Phase-in	No Phase-in	Phase-in	No Phase-in	Phase-in	No Phase-in
Valuation Date:	12/31/2018	12/31/2018	12/31/2017	12/31/2017	12/31/2018	12/31/2018	12/31/2017	12/31/2017
Fiscal Year Beginning:	January 1, 2020	January 1, 2020	January 1, 2019	January 1, 2019	January 1, 2020	January 1, 2020	January 1, 2019	January 1, 2019
Division								
01 - Gnrl Union	12.18%	12.36%	12.01%	12.38%	$ 7,586	$ 7,700	$ 7,333	$ 7,561
02 - Shrff Union	19.40%	19.77%	17.35%	18.13%	11,226	11,440	9,471	9,899
10 - Gnrl Non Union	-	-	-	-	12,942	13,374	9,368	10,232
11 - Emplys 1/93	10.37%	10.37%	14.14%	14.14%	3,981	3,981	7,745	7,745
12 - Division Trans	11.31%	11.89%	13.13%	14.05%	1,702	1,790	2,514	2,690
13 - 23rd Circuit Crt EEs Assoc	6.04%	6.16%	4.53%	4.81%	828	845	542	576
Municipality Total					**$ 38,265**	**$ 39,130**	**$ 36,973**	**$ 38,703**

Employee contribution rates:

	Employee Contribution Rate	
Valuation Date:	12/31/2018	12/31/2017
Division		
01 - Gnrl Union	1.50%	1.50%
02 - Shrff Union	4.08%	4.08%
10 - Gnrl Non Union	4.50%	4.50%
11 - Emplys 1/93	1.50%	1.50%
12 - Division Trans	1.50%	1.50%
13 - 23rd Circuit Crt EEs Assoc	2.00%	2.00%

The employer may contribute more than the minimum required contributions, as these additional contributions will earn investment income and may result in lower future contribution requirements. Employers making contributions in excess of the minimum requirements may elect to apply the excess contribution immediately to a particular division, or segregate the excess into one or more of what MERS calls "Surplus" divisions. An election in the first case would immediately reduce any unfunded accrued liability and lower the amortization payments throughout the remaining amortization period. An election to set up Surplus divisions would not immediately lower future contributions, however the assets from the Surplus division could be transferred to an unfunded division in the future to reduce the unfunded liability in future years, or to be used to pay all or a portion of the minimum required contribution in a future year. For purposes of this report, the assets in any Surplus division have been included in the municipality's total assets, unfunded accrued liability and funded status, however, these assets are not used in calculating the minimum required contribution.

MERS strongly encourages employers to contribute more than the minimum contribution shown above.

Assuming that experience of the plan meets actuarial assumptions:

• To accelerate to a 100% funding ratio in 10 years, estimated monthly employer contributions for the fiscal year beginning in 2020 for the entire employer would be $53,475, instead of $39,130.

How and Why Do These Numbers Change?

In a defined benefit plan contributions vary from one annual actuarial valuation to the next as a result of the following:

- Changes in benefit provisions (see Table 2)
- Changes in actuarial assumptions and methods (see the Appendix)
- Experience of the plan (investment experience and demographic experience); this is the difference between actual experience of the plan and the actuarial assumptions.

Comments on Investment Rate of Return Assumption

A defined benefit plan is funded by employer contributions, participant contributions, and investment earnings. Investment earnings have historically provided **more than half** of the funding. The larger the share of benefits being provided from investment returns, the smaller the required contributions, and vice versa. Determining the contributions required to prefund the promised retirement benefits requires an assumption of what investment earnings are expected to add to the fund over a long period of time. This is called the **Investment Return Assumption**.

The MERS Investment Return Assumption is **7.75%** per year. This, along with all of our other actuarial assumptions, is reviewed at least every five years in an Experience Study that compares the assumptions used against actual experience and recommends adjustments if necessary. If your municipality would like to explore contributions at lower assumed investment return assumptions, please review the "what if" projection scenarios later in this report.

Assumption Change in 2019

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

Comments on Asset Smoothing

To avoid dramatic spikes and dips in annual contribution requirements due to short term fluctuations in asset markets, MERS applies a technique called **asset smoothing**. This spreads out each year's investment gains or losses over the prior year and the following four years. This smoothing method is used to determine your actuarial value of assets (valuation assets), which is then used to determine both your funded ratio and your required contributions. The (smoothed) **actuarial rate of return for 2018 was 3.80%, while the actual market rate of return was (4.12)%.** To see historical details of the market rate of return, compared to the smoothed actuarial rate of return, refer to this report's Appendix, or view the "How Smoothing Works" video on the Defined Benefit resource page of the MERS website.

As of December 31, 2018 the actuarial value of assets is 110% of market value due to asset smoothing. This means that meeting the actuarial assumption in the next few years will require average annual market returns that exceed the 7.75% investment return assumption, or contribution requirements will continue to increase.

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

- The funded percent of your entire municipality would be 63% (instead of 69%); and
- Your total employer contribution requirement for the fiscal year starting January 1, 2020 would be $523,884 (instead of $469,560)

Alternate Scenarios to Estimate the Potential Volatility of Results ("What If Scenarios")

The calculations in this report are based on assumptions about long-term economic and demographic behavior. These assumptions will never materialize in a given year, except by coincidence. Therefore the results will vary from one year to the next. The volatility of the results depends upon the characteristics of the plan. For example:

- Open divisions that have substantial assets compared to their active employee payroll will have more volatile employer contribution rates due to investment return fluctuations.
- Open divisions that have substantial accrued liability compared to their active employee payroll will have more volatile employer contribution rates due to demographic experience fluctuations.
- Small divisions will have more volatile contribution patterns than larger divisions because statistical fluctuations are relatively larger among small populations.
- Shorter amortization periods result in more volatile contribution patterns.

Many assumptions are important in determining the required employer contributions. In the following table, we show the impact of varying the Investment Return assumption and the Wage Inflation assumption. Lower investment returns would result in higher required employer contributions, and vice-versa. Lower wage inflation generally results in lower required employer contributions as a dollar amount in the long run, and vice versa.

The relative impact of each economic scenario below will vary from year to year, as the participant demographics change. The impact of each scenario should be analyzed for a given year, not from year to year. The results in the table are based on the December 31, 2018 valuation, and are for the municipality in total, not by division. These results do not reflect a 5-year phase in of the impact of the new actuarial assumptions.

It is important to note that calculations in this report are mathematical estimates based upon assumptions regarding future events, which may or may not materialize. Actuarial calculations can and do vary from one valuation to the next, sometimes significantly depending on the group's size. Projections are not predictions. Future valuations will be based on actual future experience.

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

	Assumed Future Annual Smoothed Rate of Investment Return		
12/31/2018 Valuation Results	**Lower Future Annual Returns**	**Adopted 2019 Assumption**	**Valuation Assumptions**
Investment Return Assumption	**5.75%**	**7.35%**	**7.75%**
Wage Increase Assumption	**3.75%**	**3.00%**	**3.75%**
Accrued Liability	$ 13,759,112	$ 11,522,123	$ 11,180,146
Valuation Assets[1]	$ 7,713,550	$ 7,713,550	$ 7,713,550
Unfunded Accrued Liability	$ 6,045,562	$ 3,808,573	$ 3,466,596
Funded Ratio	56%	67%	69%
Monthly Normal Cost	$ 30,106	$ 17,797	$ 17,950
Monthly Amortization Payment	$ 32,056	$ 24,000	$ 21,180
Total Employer Contribution[2]	$ 62,162	$ 41,797	$ 39,130

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

[2] If assets exceed accrued liabilities for a division, the division may have an overfunding credit to reduce the division's employer contribution requirement. If the overfunding credit is larger than the normal cost, the division's full credit is included in the municipality's amortization payment above but the division's total contribution requirement is zero. This can cause the displayed normal cost and amortization payment to not add up to the displayed total employer contribution.

Projection Scenarios

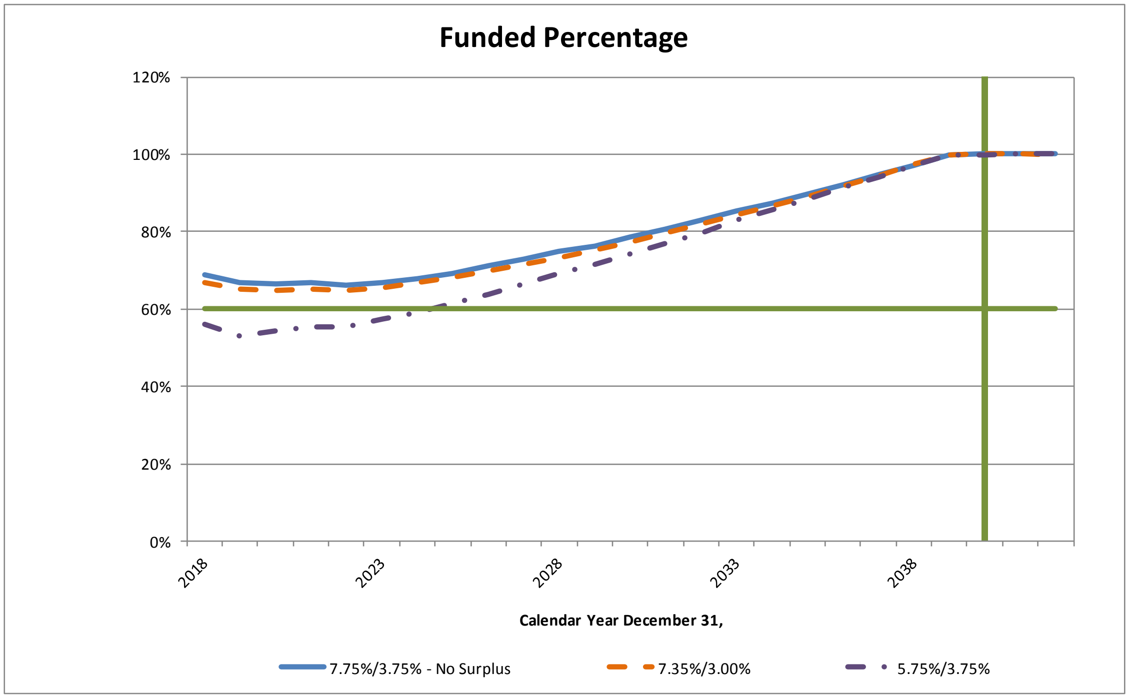
The next two pages show projections of the plan's funded ratio and computed employer contributions under the actuarial assumptions used in the valuation and alternate economic scenarios. All three projections take into account the past investment losses that will continue to affect the actuarial rate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

The 7.75%/3.75% scenario provides an estimate of computed employer contributions based on current actuarial assumptions, and a projected 7.75% market return. The other two scenarios may be useful if the municipality chooses to budget more conservatively, and make contributions in addition to the minimum requirements. The 7.35%/3.00% and 5.75%/3.75% projections provide an indication of the potential required employer contribution if these assumptions were met over the long-term.

Valuation Year Ending 12/31	Fiscal Year Beginning 1/1	Actuarial Accrued Liability	Valuation Assets[2]	Funded Percentage	Computed Annual Employer Contribution
7.75%[1]/3.75%					
NO 5-YEAR PHASE-IN					
2018	2020	$ 11,180,146	$ 7,713,550	69%	$ 469,560
2019	2021	$ 11,500,000	$ 7,700,000	67%	$ 514,000
2020	2022	$ 11,900,000	$ 7,930,000	67%	$ 542,000
2021	2023	$ 12,200,000	$ 8,150,000	67%	$ 575,000
2022	2024	$ 12,600,000	$ 8,330,000	66%	$ 614,000
2023	2025	$ 12,900,000	$ 8,630,000	67%	$ 642,000
7.35%[1]/3.00%					
NO 5-YEAR PHASE-IN					
2018	2020	$ 11,522,123	$ 7,713,550	67%	$ 501,564
2019	2021	$ 11,800,000	$ 7,670,000	65%	$ 544,000
2020	2022	$ 12,200,000	$ 7,900,000	65%	$ 570,000
2021	2023	$ 12,500,000	$ 8,120,000	65%	$ 600,000
2022	2024	$ 12,800,000	$ 8,290,000	65%	$ 635,000
2023	2025	$ 13,100,000	$ 8,590,000	66%	$ 659,000
5.75%[1]/3.75%					
NO 5-YEAR PHASE-IN					
2018	2020	$ 13,759,112	$ 7,713,550	56%	$ 745,944
2019	2021	$ 14,200,000	$ 7,550,000	53%	$ 806,000
2020	2022	$ 14,600,000	$ 7,920,000	54%	$ 842,000
2021	2023	$ 15,000,000	$ 8,300,000	55%	$ 883,000
2022	2024	$ 15,500,000	$ 8,590,000	55%	$ 934,000
2023	2025	$ 15,900,000	$ 9,110,000	57%	$ 969,000

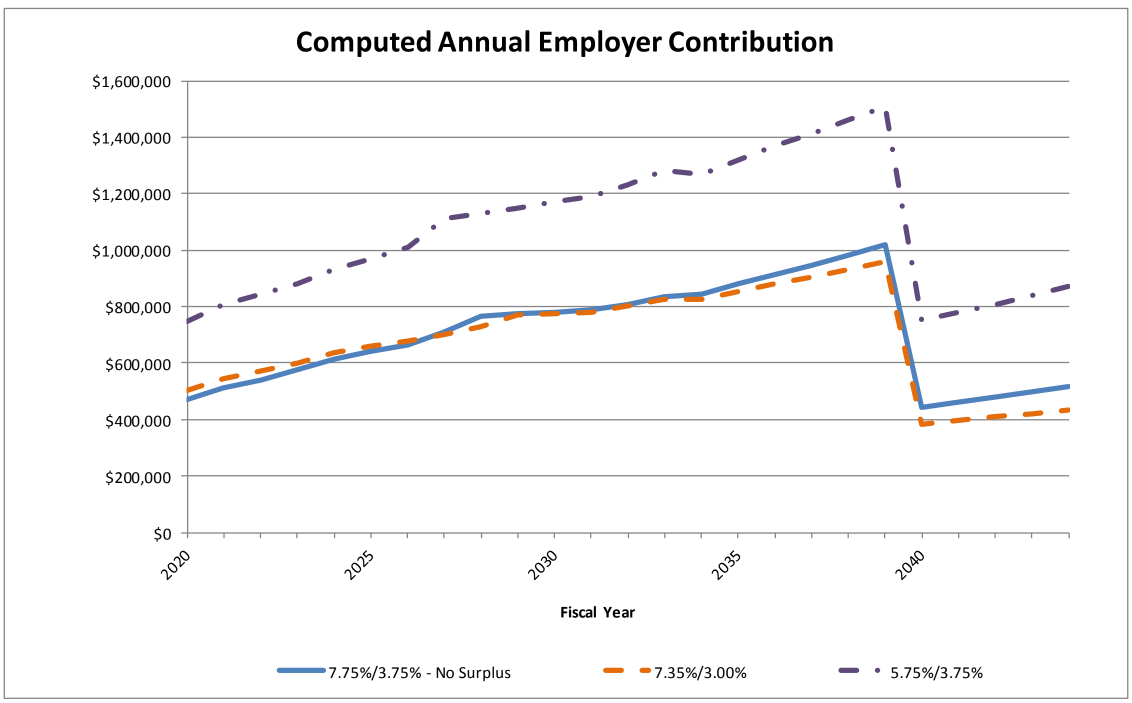
[1] Represents both the interest rate for discounting liabilities and the future investment return assumption on the Market Value of assets.

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



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

The green indicator lines have been added at 60% funded and 22 years following the valuation date for PA 202 purposes.



Notes:
All projected contributions are shown with no phase-in.

Table 1: Employer Contribution Details For the Fiscal Year Beginning January 1, 2020

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions[1]: Employer Normal Cost	Employer Contributions[1]: Payment of the Unfunded Accrued Liability[4]	Employer Contributions[1]: 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 - Gnrl Union	11.60%	1.50%	10.10%	2.26%	12.36%	12.18%			0.85%
02 - Shrff Union	13.48%	4.08%	9.40%	10.37%	19.77%	19.40%			0.87%
10 - Gnrl Non Union	15.32%	4.50%	-	-	-	-	43.16%	42.09%	
11 - Emplys 1/93	10.72%	1.50%	9.22%	1.15%	10.37%	10.37%	43.16%	42.09%	0.87%
12 - Division Trans	10.68%	1.50%	9.18%	2.71%	11.89%	11.31%			0.80%
13 - 23rd Circuit Crt EEs Assoc	10.01%	2.00%	8.01%	-1.85%	6.16%	6.04%			0.83%
Estimated Monthly Contribution[3]									
01 - Gnrl Union			$ 6,294	$ 1,406	$ 7,700	$ 7,586			
02 - Shrff Union			5,440	6,000	11,440	11,226			
10 - Gnrl Non Union			195	13,179	13,374	12,942			
11 - Emplys 1/93			3,541	440	3,981	3,981			
12 - Division Trans			1,382	408	1,790	1,702			
13 - 23rd Circuit Crt EEs Assoc			1,098	(253)	845	828			
Total Municipality			**$ 17,950**	**$ 21,180**	**$ 39,130**	**$ 38,265**			
Estimated Annual Contribution[3]			**$ 215,400**	**$ 254,160**	**$ 469,560**	**$ 459,180**			

[1] The above employer contribution requirements are in addition to the employee contributions, if any.

[2] If employee contributions are increased/decreased by 1.00% of pay, the employer contribution requirement will decrease/increase by the Employee Contribution Conversion Factor. The conversion factor is usually under 1%, because employee contributions may be refunded at termination of employment, and not used to fund retirement pensions. Employer contributions will all be used to fund pensions.

[3] For divisions that are open to new hires, estimated contributions are based on projected fiscal year payroll. Actual contributions will be based on actual reported monthly pays, and will be different from the above amounts. For divisions that will have no new hires (i.e., closed divisions), invoices will be based on the above dollar amounts which are based on projected fiscal year payroll. See description of Open Divisions and Closed Divisions in the Appendix.

[4] Note that if the overfunding credit is larger than the normal cost, the full credit is shown above but the total contribution requirement is zero. This will cause the displayed normal cost and unfunded accrued liability contributions to not add across.

[5] For linked divisions, the employer will be invoiced the Computed Employer Contribution with Phase-in rate shown above for each linked division (a contribution rate for the open division; a contribution dollar for the closed-but-linked division), unless the employer elects to contribute the Blended Employer Contribution rate shown above, by contacting MERS at 800-767-MERS (6377).

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

Table 2: Benefit Provisions

01 - Gnrl Union: Open Division

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.25% Multiplier (80% max)	2.25% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/15	55/15
Early Retirement (Reduced):	50/25	50/25
Final Average Compensation:	3 years	3 years
Employee Contributions:	1.50%	1.50%
Act 88:	Yes (Adopted 9/9/1980)	Yes (Adopted 9/9/1980)

02 - Shrff Union: Open Division

	2018 Valuation	2017 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):	50/25	50/25
	55/15	55/15
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
Employee Contributions:	4.08%	4.08%
Act 88:	Yes (Adopted 9/9/1980)	Yes (Adopted 9/9/1980)

10 - Gnrl Non Union: Closed to new hires, linked to Division 11

	2018 Valuation	2017 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):	55/15	55/15
Early Retirement (Reduced):	50/25	50/25
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
COLA for Current Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	4.50%	4.50%
Act 88:	Yes (Adopted 9/9/1980)	Yes (Adopted 9/9/1980)

11 - Emplys 1/93: Open Division, linked to Division 10

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.25% Multiplier (80% max)	2.25% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	1.50%	1.50%
Act 88:	Yes (Adopted 9/9/1980)	Yes (Adopted 9/9/1980)

12 - Division Trans: Open Division

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.25% Multiplier (80% max)	2.25% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/15	55/15
Early Retirement (Reduced):	50/25	50/25
Final Average Compensation:	3 years	3 years
Employee Contributions:	1.50%	1.50%
Act 88:	Yes (Adopted 9/9/1980)	Yes (Adopted 9/9/1980)

13 - 23rd Circuit Crt EEs Assoc: Open Division

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.25% Multiplier (80% max)	2.25% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	2.00%	2.00%
Act 88:	Yes (Adopted 9/9/1980)	Yes (Adopted 9/9/1980)

Table 3: Participant Summary

Division	2018 Valuation Number	2018 Valuation Annual Payroll[1]	2017 Valuation Number	2017 Valuation Annual Payroll[1]	2018 Valuation Average Age	2018 Valuation Average Benefit Service[2]	2018 Valuation Average Eligibility Service[2]
01 - Gnrl Union							
Active Employees	18	$ 694,709	19	$ 680,866	45.3	6.8	7.7
Vested Former Employees	1	1,151	2	3,450	66.5	1.2	37.8
Retirees and Beneficiaries	12	80,370	11	68,592	71.9		
02 - Shrff Union							
Active Employees	15	$ 645,195	14	$ 608,819	38.2	6.4	7.6
Vested Former Employees	9	67,506	9	67,506	38.8	6.9	12.3
Retirees and Beneficiaries	14	177,543	12	141,999	64.0		
10 - Gnrl Non Union							
Active Employees	1	$ 38,840	1	$ 38,041	63.0	31.8	31.8
Vested Former Employees	2	10,097	2	10,097	58.7	12.1	12.1
Retirees and Beneficiaries	24	368,102	25	367,225	74.5		
11 - Emplys 1/93							
Active Employees	12	$ 409,419	19	$ 592,710	51.0	8.4	9.9
Vested Former Employees	2	2,112	2	3,199	45.2	4.0	18.1
Retirees and Beneficiaries	9	42,987	8	41,227	73.6		
12 - Division Trans							
Active Employees	4	$ 167,770	5	$ 213,432	57.5	28.6	28.6
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	2	17,606	2	17,606	59.4		
13 - 23rd Circuit Crt EEs Assoc							
Active Employees	5	$ 152,838	5	$ 133,608	49.4	7.9	7.9
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
Total Municipality							
Active Employees	**55**	**$ 2,108,771**	**63**	**$ 2,267,476**	**46.2**	**9.2**	**10.1**
Vested Former Employees	**14**	**80,866**	**15**	**84,252**	**44.5**	**6.8**	**14.9**
Retirees and Beneficiaries	**61**	**686,608**	**58**	**636,649**	**71.0**		
Total Participants	**130**		**136**				

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

[2] Descriptions can be found under Miscellaneous and Technical Assumptions in the Appendix.

Table 4: Reported Assets (Market Value)

Division	2018 Valuation		2017 Valuation	
	Employer and Retiree[1]	Employee[2]	Employer and Retiree[1]	Employee[2]
01 - Gnrl Union	$ 1,062,296	$ 52,572	$ 1,089,964	$ 45,744
02 - Shrff Union	1,766,039	250,506	1,844,538	267,794
10 - Gnrl Non Union	1,696,592	57,553	2,124,423	54,375
11 - Emplys 1/93	813,178	74,483	708,533	64,216
12 - Division Trans	1,033,488	46,857	1,072,223	47,129
13 - 23rd Circuit Crt EEs Assoc	171,434	17,142	174,006	13,724
Municipality Total[3]	**$ 6,543,027**	**$ 499,112**	**$ 7,013,687**	**$ 492,982**
Combined Assets[3]	**$7,042,138**		**$7,506,669**	

[1] Reserve for Employer Contributions and Benefit Payments.
[2] Reserve for Employee Contributions.
[3] Totals may not add due to rounding.

The December 31, 2018 valuation assets (actuarial value of assets) are equal to 1.095342 times the reported market value of assets (compared to 1.011321 as of December 31, 2017). Refer to the Appendix for a description of the valuation asset derivation and a detailed calculation of valuation assets.

Table 5: Flow of Valuation Assets

Year Ended 12/31	Employer Contributions Required	Employer Contributions Additional	Employee Contributions	Investment Income (Valuation Assets)	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
2008	$ 212,148		$ 35,545	$ 258,090	$ (381,605)	$ 0	$ 0	$ 6,084,355
2009	286,954		34,015	248,877	(498,376)	(585)	0	6,155,240
2010	317,912		32,551	326,318	(498,048)	(248)	0	6,333,725
2011	294,839	$ 14,142	34,249	312,390	(535,386)	(2,582)	0	6,451,377
2012	261,039	36,015	38,415	280,564	(542,990)	(15,436)	0	6,508,984
2013	303,545	18,014	43,150	381,770	(557,606)	0	(1)	6,697,856
2014	436,030	0	43,916	389,911	(560,198)	(1,062)	0	7,006,453
2015	389,627	10,000	48,727	350,172	(588,613)	(9,726)	0	7,206,640
2016	362,567	50,820	47,907	376,121	(617,562)	(6,726)	16,946	7,436,713
2017	419,230	28,800	50,084	433,167	(628,817)	(14,684)	(132,842)	7,591,651
2018	437,768	2,975	55,323	279,758	(649,467)	(4,458)	0	7,713,550

Notes:

Transfers in and out are usually related to the transfer of participants between municipalities, and to employer and employee payments for service credit purchases (if any) that the governing body has approved.

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

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

The Valuation Asset balance includes assets from Surplus divisions, if any.

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

Table 6: Actuarial Accrued Liabilities and Valuation Assets as of December 31, 2018

Division	Actuarial Accrued Liability: Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
01 - Gnrl Union	$ 708,180	$ 11,053	$ 720,888	$ 15,327	$ 1,455,448	$ 1,221,161	83.9%	$ 234,287
02 - Shrff Union	957,858	281,610	1,935,653	8,965	3,184,086	2,208,806	69.4%	975,280
10 - Gnrl Non Union	311,899	113,320	3,634,096	41	4,059,356	1,921,389	47.3%	2,137,967
11 - Emplys 1/93	632,050	9,861	374,048	26,778	1,042,737	972,292	93.2%	70,445
12 - Division Trans	1,052,315	0	204,914	0	1,257,229	1,183,347	94.1%	73,882
13 - 23rd Circuit Crt EEs Assoc	178,736	0	0	2,554	181,290	206,555	113.9%	(25,265)
Total	**$ 3,841,038**	**$ 415,844**	**$ 6,869,599**	**$ 53,665**	**$ 11,180,146**	**$ 7,713,550**	**69.0%**	**$ 3,466,596**

The following results show the combined accrued liabilities and assets for each set of linked divisions. These results are already shown in the table on the prior page(s).

Table 6 (continued)

Division	Actuarial Accrued Liability: Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
Linked Divisions 11, 10	$ 943,949	$ 123,181	$ 4,008,144	$ 26,819	$ 5,102,093	$ 2,893,681	56.7%	$ 2,208,412

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

Table 7: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2004	$ 6,565,467	$ 4,853,054	74%	$ 1,712,413
2005	6,841,511	5,154,367	75%	1,687,144
2006	7,175,131	5,540,659	77%	1,634,472
2007	7,746,453	5,960,177	77%	1,786,276
2008	8,513,442	6,084,355	71%	2,429,087
2009	8,711,783	6,155,240	71%	2,556,543
2010	8,891,801	6,333,725	71%	2,558,076
2011	9,191,920	6,451,377	70%	2,740,543
2012	9,380,409	6,508,984	69%	2,871,425
2013	9,349,319	6,697,856	72%	2,651,463
2014	9,768,493	7,006,453	72%	2,762,040
2015	10,838,241	7,206,640	67%	3,631,601
2016	10,903,641	7,436,713	68%	3,466,928
2017	11,003,519	7,591,651	69%	3,411,868
2018	11,180,146	7,713,550	69%	3,466,596

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

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

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

Tables 8 and 9: Division-Based Comparative Schedules

Division 01 - Gnrl Union

Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	$ 855,511	$ 698,144	82%	$ 157,367
2009	867,726	730,114	84%	137,612
2010	863,283	715,614	83%	147,669
2011	900,831	759,137	84%	141,694
2012	958,513	799,457	83%	159,056
2013	1,056,782	859,812	81%	196,970
2014	1,159,298	924,755	80%	234,543
2015	1,279,858	935,440	73%	344,418
2016	1,388,235	1,030,782	74%	357,453
2017	1,427,735	1,148,565	80%	279,170
2018	1,455,448	1,221,161	84%	234,287

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

Table 9-01: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2008	14	$ 324,652	12.39%	1.00%
2009	15	353,017	11.80%	1.00%
2010	16	408,820	11.77%	1.00%
2011	16	398,448	11.94%	1.00%
2012	15	380,714	12.58%	1.00%
2013	15	428,582	12.80%	1.00%
2014	15	440,230	13.36%	1.00%
2015	17	545,937	14.18%	1.00%
2016	26	913,690	12.90%	1.00%
2017	19	680,866	12.38%	1.50%
2018	18	694,709	12.36%	1.50%

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 contributon will be adjusted.

Note: The contributions shown in Table 9 for the 12/31/2015 through 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Table 8-02: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	$ 1,853,839	$ 1,494,432	81%	$ 359,407
2009	1,938,299	1,598,332	82%	339,967
2010	2,100,858	1,723,826	82%	377,032
2011	2,260,122	1,802,165	80%	457,957
2012	2,271,702	1,862,600	82%	409,102
2013	2,544,477	1,697,968	67%	846,509
2014	2,698,342	1,770,470	66%	927,872
2015	3,070,751	1,915,831	62%	1,154,920
2016	2,910,952	2,021,170	69%	889,782
2017	2,943,844	2,136,246	73%	807,598
2018	3,184,086	2,208,806	69%	975,280

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

Table 9-02: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2008	14	$ 519,286	12.14%	3.58%
2009	15	574,412	12.00%	3.58%
2010	13	496,986	13.18%	3.58%
2011	15	561,589	13.28%	4.08%
2012	13	487,688	13.88%	4.08%
2013	15	619,571	17.34%	4.08%
2014	15	641,532	17.63%	4.08%
2015	16	709,679	19.65%	4.08%
2016	14	569,382	19.04%	4.08%
2017	14	608,819	18.13%	4.08%
2018	15	645,195	19.77%	4.08%

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 contributon will be adjusted.

Note: The contributions shown in Table 9 for the 12/31/2015 through 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Division 10 - Gnrl Non Union

Table 8-10: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	$ 4,680,492	$ 2,981,041	64%	$ 1,699,451
2009	4,722,057	2,727,218	58%	1,994,839
2010	4,603,159	2,450,476	53%	2,152,683
2011	4,610,597	2,166,863	47%	2,443,734
2012	4,630,817	1,853,664	40%	2,777,153
2013	4,013,079	1,604,348	40%	2,408,731
2014	4,005,672	1,630,338	41%	2,375,334
2015	4,292,187	1,350,403	32%	2,941,784
2016	4,240,370	1,022,739	24%	3,217,631
2017	4,140,517	2,203,464	53%	1,937,053
2018	4,059,356	1,921,389	47%	2,137,967

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

Table 9-10: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2008	3	$ 72,069	$ 8,757	4.00%
2009	3	74,003	$ 10,054	4.00%
2010	2	65,047	$ 10,693	4.00%
2011	2	66,598	$ 12,374	4.50%
2012	2	66,198	258.76%	4.50%
2013	3	100,599	$ 12,811	4.50%
2014	3	104,207	$ 13,089	4.50%
2015	1	38,600	$ 16,846	4.50%
2016	1	37,541	$ 30,129	4.50%
2017	1	38,041	$ 10,232	4.50%
2018	1	38,840	$ 13,374	4.50%

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 contributon will be adjusted.

Note: The contributions shown in Table 9 for the 12/31/2015 through 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Table 8-11: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	$ 504,038	$ 435,911	86%	$ 68,127
2009	576,102	572,368	99%	3,734
2010	620,033	793,111	128%	(173,078)
2011	579,882	891,562	154%	(311,680)
2012	607,772	1,089,341	179%	(481,569)
2013	694,612	1,548,259	223%	(853,647)
2014	780,414	1,618,318	207%	(837,904)
2015	896,336	1,864,734	208%	(968,398)
2016	977,504	2,138,254	219%	(1,160,750)
2017	1,042,920	781,497	75%	261,423
2018	1,042,737	972,292	93%	70,445

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		
2008	14	$ 348,237	8.91%	1.00%
2009	19	508,284	7.84%	1.00%
2010	20	518,955	4.07%	1.00%
2011	17	423,140	0.05%	1.00%
2012	11	341,912	0.00%	1.50%
2013	15	432,390	0.00%	1.50%
2014	17	465,833	0.00%	1.50%
2015	18	517,350	0.00%	1.50%
2016	17	508,815	0.00%	1.50%
2017	19	592,710	14.14%	1.50%
2018	12	409,419	10.37%	1.50%

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 contributon will be adjusted.

Note: The contributions shown in Table 9 for the 12/31/2015 through 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Table 8-12: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	$ 619,562	$ 474,827	77%	$ 144,735
2009	607,599	527,208	87%	80,391
2010	704,468	650,698	92%	53,770
2011	754,404	714,137	95%	40,267
2012	807,906	770,858	95%	37,048
2013	911,502	836,315	92%	75,187
2014	975,075	893,260	92%	81,815
2015	1,176,975	983,644	84%	193,331
2016	1,248,304	1,051,291	84%	197,013
2017	1,299,222	1,132,024	87%	167,198
2018	1,257,229	1,183,347	94%	73,882

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

Table 9-12: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2008	4	$ 153,996	13.81%	1.00%
2009	4	149,664	11.95%	1.00%
2010	5	173,582	10.95%	1.00%
2011	4	144,948	10.56%	1.50%
2012	4	146,264	10.60%	1.50%
2013	4	150,686	12.15%	1.50%
2014	4	150,840	12.35%	1.50%
2015	5	195,217	15.39%	1.50%
2016	5	209,912	14.96%	1.50%
2017	5	213,432	14.05%	1.50%
2018	4	167,770	11.89%	1.50%

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 contributon will be adjusted.

Note: The contributions shown in Table 9 for the 12/31/2015 through 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Table 8-13: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	$ 0	$ 0	0%	$ 0
2009	0	0	0%	0
2010	0	0	0%	0
2011	86,084	117,513	137%	(31,429)
2012	103,699	133,064	128%	(29,365)
2013	128,867	151,154	117%	(22,287)
2014	149,692	169,312	113%	(19,620)
2015	122,134	156,588	128%	(34,454)
2016	138,276	172,477	125%	(34,201)
2017	149,281	189,855	127%	(40,574)
2018	181,290	206,555	114%	(25,265)

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

Table 9-13: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution[1]	Employee Contribution Rate[2]
	Number	Annual Payroll		
2008	0	$ 0	$ 0	0.00%
2009	0	0	$ 0	0.00%
2010	0	0	$ 0	0.00%
2011	5	129,816	5.08%	1.00%
2012	5	136,189	5.36%	1.00%
2013	5	139,218	6.06%	1.00%
2014	5	134,643	5.36%	2.00%
2015	4	103,996	4.20%	2.00%
2016	5	144,206	4.32%	2.00%
2017	5	133,608	4.81%	2.00%
2018	5	152,838	6.16%	2.00%

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 contributon will be adjusted.

Note: The contributions shown in Table 9 for the 12/31/2015 through 12/31/2019 valuations do **not** reflect the phase-in of the increased contribution requirements associated with the new actuarial assumptions. The full contribution without phase-in is shown in Table 9 above. The contribution requirements including the 5-year phase-in are shown on page 2.

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

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

Table 10: Division-Based Layered Amortization Schedule

Division 01 - Gnrl Union

Table 10-01: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2020: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 344,418	23	$ 359,557	20	$ 26,100
(Gain)/Loss	12/31/2016	4,923	22	5,370	20	396
(Gain)/Loss	12/31/2017	(79,580)	21	(86,138)	20	(6,252)
Amendment	12/31/2017	(2,111)	21	(2,289)	20	(168)
(Gain)/Loss	12/31/2018	(40,961)	20	(44,135)	20	(3,204)
Total				**$ 232,365**		**$ 16,872**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

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

The unfunded accrued liability (UAL) as of December 31, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Table 10-02: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2020: Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 1,154,920	23	$ 1,205,151	20	$ 87,480
(Gain)/Loss	12/31/2016	(291,734)	22	(317,890)	20	(23,076)
(Gain)/Loss	12/31/2017	(69,808)	21	(75,553)	20	(5,484)
(Gain)/Loss	12/31/2018	167,239	20	180,200	20	13,080
Total				**$ 991,908**		**$ 72,000**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

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

The unfunded accrued liability (UAL) as of December 31, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Table 10-10: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2020 Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
Initial	12/31/2015	$ 2,941,784	23	$ 2,927,840	20	$ 212,532
(Gain)/Loss	12/31/2016	207,172	22	225,736	20	16,392
(Gain)/Loss	12/31/2017	(1,322,626)	21	(1,431,581)	20	(103,920)
(Gain)/Loss	12/31/2018	423,761	20	456,603	20	33,144
Total				**$ 2,178,598**		**$ 158,148**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

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

The unfunded accrued liability (UAL) as of December 31, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Table 10-11: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance[1]	Original Amortization Period[2]	Amounts for Fiscal Year Beginning 1/1/2020 Outstanding UAL Balance[3]	Remaining Amortization Period[2]	Annual Amortization Payment
(Gain)/Loss	12/31/2017	$ 385,941	15	$ 409,668	14	$ 38,388
(Gain)/Loss	12/31/2018	(345,398)	15	(372,166)	15	(33,108)
Total				**$ 37,502**		**$ 5,280**

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

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

Division 12 - Division Trans

Table 10-12: Layered Amortization Schedule

				Amounts for Fiscal Year Beginning 1/1/2020		
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	$ 193,331	23	$ 205,382	20	$ 14,904
(Gain)/Loss	12/31/2016	(4,343)	22	(4,722)	20	(348)
(Gain)/Loss	12/31/2017	(31,222)	21	(33,795)	20	(2,448)
(Gain)/Loss	12/31/2018	(92,229)	20	(99,377)	20	(7,212)
Total				**$ 67,488**		**$ 4,896**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

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

The unfunded accrued liability (UAL) as of December 31, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

Table 10-13: Layered Amortization Schedule

				Amounts for Fiscal Year Beginning 1/1/2020		
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	$ (34,454)	10	$ (29,394)	10	$ (3,600)
(Gain)/Loss	12/31/2016	33	15	42	13	0
(Gain)/Loss	12/31/2017	(8,073)	15	(8,563)	14	(804)
(Gain)/Loss	12/31/2018	14,316	15	15,425	15	1,368
Total				**$ (22,490)**		**$ (3,036)**

[1] For each type of UAL (layer), this is the original balance as of the date the layer was established.

[2] According to the MERS amortization policy, each type of UAL (layer) is amortized over a specific period (see Appendix on MERS website).

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

The unfunded accrued liability (UAL) as of December 31, 2018 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2018 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

GASB 68 Information

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

Actuarial Valuation Date:		12/31/2018
Measurement Date of the Total Pension Liability (TPL):		12/31/2018
At 12/31/2018, the following employees were covered by the benefit terms:		
Inactive employees or beneficiaries currently receiving benefits:		61
Inactive employees entitled to but not yet receiving benefits (including refunds):		68
Active employees:		55
		184
Total Pension Liability as of 12/31/2017 measurement date:	$	10,736,237
Total Pension Liability as of 12/31/2018 measurement date:	$	10,915,546
Service Cost for the year ending on the 12/31/2018 measurement date:	$	232,745
Change in the Total Pension Liability due to:		
- Benefit changes[1]:	$	0
- Differences between expected and actual experience[2]:	$	(241,563)
- 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):		3
Covered employee payroll: (Needed for Required Supplementary Information)	$	2,108,771

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:	$ 1,129,874	$ -	$ (955,509)

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:	12/31/2018
Measurement Date of the Total Pension Liability (TPL):	12/31/2019

At 12/31/2018, the following employees were covered by the benefit terms:

Inactive employees or beneficiaries currently receiving benefits:	61
Inactive employees entitled to but not yet receiving benefits (including refunds):	68
Active employees:	55
	184

Total Pension Liability as of 12/31/2018 measurement date:	$	11,155,202
Total Pension Liability as of 12/31/2019 measurement date:	$	11,234,660
Service Cost for the year ending on the 12/31/2019 measurement date:	$	246,578

Change in the Total Pension Liability due to:

- Benefit changes[1]:	$	0
- Differences between expected and actual experience[2]:	$	(258,828)
- 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):		3
Covered employee payroll: (Needed for Required Supplementary Information)	$	2,108,771

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 12/31/2019:	$ 1,162,383	$ -	$ (982,106)

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 - Gnrl Union

1/1/2018	Participant Contribution Rate 1.5%
12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2009	E 2% COLA Adopted (01/01/2009)
4/1/2008	Day of work defined as 130 Hours a Month for All employees.
1/1/2008	E 2% COLA Adopted (01/01/2008)
1/1/2007	E 2% COLA Adopted (01/01/2007)
1/1/2006	E 2% COLA Adopted (01/01/2006)
1/1/2005	E 2% COLA Adopted (01/01/2005)
1/1/2004	E 2% COLA Adopted (01/01/2004)
1/1/2003	E 2% COLA Adopted (01/01/2003)
1/1/2002	E 2% COLA Adopted (01/01/2002)
1/1/2001	E 2% COLA Adopted (01/01/2001)
1/1/2000	E 2% COLA Adopted (01/01/2000)
1/1/1999	Flexible E 2% COLA Adopted (01/01/1999)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	Flexible E 2% COLA Adopted (01/01/1990)
1/1/1989	E 2% COLA Adopted (01/01/1989)
5/1/1988	Benefit FAC-3 (3 Year Final Average Compensation)
5/1/1988	Benefit B-3 (80% max)
5/1/1988	Benefit F55 (With 15 Years of Service)
1/1/1988	E 2% COLA Adopted (01/01/1988)
1/1/1987	E 2% COLA Adopted (01/01/1987)
1/1/1985	Member Contribution Rate 1.00%
9/9/1980	Covered by Act 88
4/1/1977	Benefit FAC-5 (5 Year Final Average Compensation)
4/1/1977	10 Year Vesting
4/1/1977	Benefit C-1 (Old)
4/1/1977	Member Contribution Rate 3.00% Under $4,200.00 - Then 5.00%
4/1/1977	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

02 - Shrff Union

12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2011	Member Contribution Rate 4.08%
1/1/2009	E 2% COLA Adopted (01/01/2009)
1/1/2008	E 2% COLA Adopted (01/01/2008)
1/1/2007	E 2% COLA Adopted (01/01/2007)
1/1/2006	E 2% COLA Adopted (01/01/2006)
1/1/2005	E 2% COLA Adopted (01/01/2005)
1/1/2004	E 2% COLA Adopted (01/01/2004)
1/1/2003	E 2% COLA Adopted (01/01/2003)

02 - Shrff Union

1/1/2002	E 2% COLA Adopted (01/01/2002)
12/1/2001	Benefit B-4 (80% max)
12/1/2001	Member Contribution Rate 3.58%
1/1/2001	Benefit F50 (With 25 Years of Service)
1/1/2001	E 2% COLA Adopted (01/01/2001)
1/1/2000	E 2% COLA Adopted (01/01/2000)
1/1/1999	Flexible E 2% COLA Adopted (01/01/1999)
1/1/1990	Flexible E 2% COLA Adopted (01/01/1990)
1/1/1989	E 2% COLA Adopted (01/01/1989)
5/1/1988	Benefit FAC-3 (3 Year Final Average Compensation)
5/1/1988	Benefit B-3 (80% max)
5/1/1988	Benefit F55 (With 15 Years of Service)
1/1/1988	E 2% COLA Adopted (01/01/1988)
1/1/1987	E 2% COLA Adopted (01/01/1987)
1/1/1985	Member Contribution Rate 1.00%
9/9/1980	Covered by Act 88
4/1/1977	Benefit FAC-5 (5 Year Final Average Compensation)
4/1/1977	10 Year Vesting
4/1/1977	Benefit C-1 (Old)
4/1/1977	Member Contribution Rate 3.00% Under $4,200.00 - Then 5.00%
4/1/1977	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

10 - Gnrl Non Union

12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2011	Member Contribution Rate 4.50%
4/1/2008	Day of work defined as 130 Hours a Month for All employees.
1/1/2003	E 2% COLA Adopted (01/01/2003)
1/1/1992	Member Contribution Rate 4.00%
12/31/1991	Member Contribution Rate 0.00%
1/1/1991	E1 2.5% COLA for past retirees (09/01/1990)
1/1/1991	E2 2.5% COLA for future retirees (09/01/1990)
9/1/1990	Benefit FAC-3 (3 Year Final Average Compensation)
9/1/1990	10 Year Vesting
9/1/1990	Benefit B-4 (80% max)
9/1/1990	Benefit F55 (With 15 Years of Service)
9/1/1990	Member Contribution Rate 1.00%
1/1/1990	Flexible E 2% COLA Adopted (01/01/1990)
1/1/1989	E 2% COLA Adopted (01/01/1989)
1/1/1988	E 2% COLA Adopted (01/01/1988)
1/1/1987	E 2% COLA Adopted (01/01/1987)
9/9/1980	Covered by Act 88
4/1/1977	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

11 - Emplys 1/93

12/1/2016	Service Credit Purchase Estimates - Yes

11 - Emplys 1/93

1/1/2012	Day of work defined as 130 Hours a Month for All employees.
1/1/2012	Member Contribution Rate 1.50%
8/1/2000	Benefit B-3 (80% max)
1/1/1993	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1993	10 Year Vesting
1/1/1993	Benefit C-1 (New)
1/1/1993	Member Contribution Rate 1.00%
9/9/1980	Covered by Act 88
4/1/1977	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

12 - Division Trans

12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2011	Member Contribution Rate 1.50%
4/1/2008	Day of work defined as 130 Hours a Month for All employees.
7/1/2000	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2000	10 Year Vesting
7/1/2000	Benefit B-3 (80% max)
7/1/2000	Benefit F55 (With 15 Years of Service)
7/1/2000	Member Contribution Rate 1.00%
9/9/1980	Covered by Act 88
4/1/1977	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

13 - 23rd Circuit Crt EEs Assoc

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2015	Participant Contribution Rate 2%
10/1/2011	Benefit FAC-5 (5 Year Final Average Compensation)
10/1/2011	10 Year Vesting
10/1/2011	Day of work defined as 130 Hours a Month for All employees.
10/1/2011	Benefit B-3 (80% max)
10/1/2011	Member Contribution Rate 1.00%
9/9/1980	Covered by Act 88
4/1/1977	Fiscal Month - January
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

Plan Provisions, Actuarial Assumptions, and Actuarial Funding Method

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

Increase in Final Average Compensation

Division	FAC Increase Assumption
All Divisions	2.00%

Withdrawal Rate Scaling Factor

Division	Withdrawal Rate Scaling Factor
All Divisions	100%

Miscellaneous and Technical Assumptions

Loads – None.

Risk Commentary

Determination of the accrued liability, the employer contribution, and the funded ratio requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability, the actuarially determined contribution and the funded ratio that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

- **Investment Risk** – actual investment returns may differ from the expected returns;
- **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
- **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
- **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
- **Other Demographic Risks –** members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

  The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

1. Ratio of the market value of assets to total payroll	3.3
2. Ratio of actuarial accrued liability to payroll	5.3
3. Ratio of actives to retirees and beneficiaries	0.9
4. Ratio of market value of assets to benefit payments	10.8
5. Ratio of net cash flow to market value of assets (boy)	-2.1%

RATIO OF MARKET VALUE OF ASSETS TO TOTAL PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF MARKET VALUE OF ASSETS TO BENEFIT PAYMENTS

The MERS' Actuarial Policy requires a total minimum contribution equal to the excess (if any) of three times the expected annual benefit payments over the projected market value of assets as of the participating municipality or court's Fiscal Year for which the contribution applies. The ratio of market value of assets to benefit payments as of the valuation date provides an indication of whether the division is at risk for triggering the minimum contribution rule in the near term. If the division triggers this minimum contribution rule, the required employer contributions could increase dramatically relative to previous valuations.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

State Reporting

The following information has been prepared to provide some of the information necessary to complete the pension reporting requirements for the State of Michigan's Local Government Retirement System Annual Report (Form No. 5572). Additional resources are available at www.mersofmich.com and on the State website.

Form 5572 Line Reference	Description	Result
10	**Membership as of December 31, 2018**	
11	Indicate number of active members	55
12	Indicate number of inactive members	14
13	Indicate number of retirees and beneficiaries	61
14	**Investment Performance for Calendar Year Ending December 31, 2018**[1]	
15	Enter actual rate of return - prior 1-year period	-3.64%
16	Enter actual rate of return - prior 5-year period	4.94%
17	Enter actual rate of return - prior 10-year period	8.25%
18	**Actuarial Assumptions**	
19	Actuarial assumed rate of investment return[2]	7.75%
20	Amortization method utilized for funding the system's unfunded actuarial accrued liability, if any	Level Percent
21	Amortization period utilized for funding the system's unfunded actuarial accrued liability, if any[3]	20
22	Is each division within the system closed to new employees?[4]	No
23	**Uniform Assumptions**	
24	Enter retirement pension system's actuarial value of assets using uniform assumptions	$7,713,550
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions	$12,045,420
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending December 31,2019	$548,172

1. The Municipal Employees' Retirement System's investment performance has been provided to GRS from MERS Investment Staff and included here for reporting purposes. This investment performance figures reported are net of fees on a rolling calendar-year basis for the previous 1-, 5-, and 10-year periods as required under PA 530.
2. Net of administrative and investment expenses.
3. Populated with the longest amortization period remaining in the amortization schedule, across all divisions in the plan. This is when each division and the plan in total is expected to reach 100% funded if all assumptions are met.
4. If all divisions within the employer are closed, "yes." If at least one division is open (including shadow divisions) indicate "no."