



# Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report  
December 31, 2019 - Hastings, City of (0801)





Spring, 2020

Hastings, City of

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

This report presents the results of the Annual Actuarial Valuation, prepared for Hastings, City of (0801) as of December 31, 2019. 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. Hastings, City of is responsible for the employer contributions needed to provide MERS benefits for its employees and former employees.

The purposes of this valuation are to:

- Measure funding progress as of December 31, 2019,
- Establish contribution requirements for the fiscal year beginning July 1, 2021,
- 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, 2019. 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. A study was completed in 2015, as prepared by the prior actuary, and is the basis of the demographic 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. **At the February 27, 2020 board meeting, the MERS Retirement Board adopted demographic assumptions effective with the December 31, 2020 annual actuarial valuation, which will impact contributions beginning in 2022.** 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-2019AnnualActuarialValuation-Appendix.pdf>

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

**This report does not reflect the recent and still developing impact of COVID-19, which is likely to influence demographic and economic experience, at least in the short-term. We will continue to monitor these developments and their impact on the MERS Defined Benefit and Hybrid plans. Actual experience will be reflected in each subsequent annual valuation, as experience emerges.**

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

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

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



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

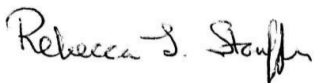
This report was prepared at the request of the MERS Retirement Board and may be provided only in its entirety by the municipality to other interested parties (MERS customarily provides the full report on request to associated third parties such as the auditor for the municipality). GRS is not responsible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

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

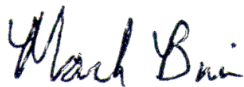
Sincerely,



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



Rebecca L. Stouffer, ASA, FCA, MAAA



Mark Buis, FSA, FCA, EA, MAAA



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# Executive Summary

## Funded Ratio

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

	12/31/2019	12/31/2018
Funded Ratio*	46%	50%

\* Reflects assets from Surplus divisions, if any.

Throughout this report are references to valuation results generated prior to the 2018 valuation date. Results prior to 2018 were received directly from the prior actuary or extracted from the previous valuation system by MERS's technology service provider.

## Required Employer Contributions:

Your required employer contributions are shown in the following table. Employee contributions, if any, are in addition to the employer contributions. Changes to the actuarial assumptions and methods based on the 2015 Experience Study are fully phased-in with this valuation.

Effective this valuation, the MERS Retirement Board has adopted a reduction in the investment rate of return assumption from 7.75% to 7.35% and a reduction in the rate of wage inflation from 3.75% to 3.00%. Changes to these assumptions are effective for contributions beginning in 2021 and may be phased-in. This valuation reflects the first year of phase-in.

By default, MERS will invoice you based on the amount in the “No Phase-in” columns. This amount will be considered the minimum required contribution unless you request to be billed the “Phase-in” rates. If you wish to be billed using the phased-in rates, please contact MERS, at which point the alternate minimum required contribution will be the amount in the “Phase-in” columns. Please note that this approach is different than in years past.

	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: 12/31/2019	12/31/2019	12/31/2018	12/31/2018	12/31/2019	12/31/2019	12/31/2018	12/31/2018
Fiscal Year Beginning:	July 1, 2021	July 1, 2021	July 1, 2020	July 1, 2020	July 1, 2021	July 1, 2021	July 1, 2020	July 1, 2020
<b>Division</b>								
01 - General	-	-	-	-	\$ 31,413	\$ 33,168	\$ 27,761	\$ 28,353
02 - Police	-	-	-	-	13,604	14,564	11,403	11,695
05 - Fire FT	-	-	-	-	3,997	4,264	3,183	3,264
11 - Dpt Pblc Srv	-	-	-	-	14,315	15,260	12,947	13,254
12 - City Council	-	-	-	-	471	477	707	708
51 - Fire Vlnkeer	-	-	-	-	0	0	0	0
HA - Dpt of Pub Svs hired af 7/1/07	4.32%	4.27%	4.01%	4.01%	1,695	1,677	1,704	1,705
HB - General hired after 7/1/08	5.53%	5.54%	5.31%	5.33%	3,214	3,220	2,881	2,891
HC - Fire FT after 7/1/07	-	-	-	-	0	0	0	0
HD - Police after 7/01/10	4.06%	4.01%	4.58%	4.58%	1,857	1,836	1,605	1,606
HE - City Cncil aft 1/1/16 -Volntry	5.51%	5.51%	5.42%	5.42%	15	15	15	15
<b>Municipality Total</b>					<b>\$ 70,581</b>	<b>\$ 74,481</b>	<b>\$ 62,206</b>	<b>\$ 63,491</b>

Employee contribution rates:

Valuation Date:	Employee Contribution Rate	
	12/31/2019	12/31/2018
<b>Division</b>		
01 - General	0.00%	0.00%
02 - Police	2.10%	2.10%
05 - Fire FT	0.00%	0.00%
11 - Dpt Pblc Srv	0.00%	0.00%
12 - City Council	0.00%	0.00%
51 - Fire Vlnkeer	3% < ; 5% >	3% < ; 5% >
HA - Dpt of Pub Svs hired af 7/1/07	0.00%	0.00%
HB - General hired after 7/1/08	0.00%	0.00%
HC - Fire FT after 7/1/07	0.00%	0.00%
HD - Police after 7/01/10	0.00%	0.00%
HE - City Cncil aft 1/1/16 -Volntry	0.00%	0.00%

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 2021 for the entire employer would be \$112,270, instead of \$74,481.

### **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 a significant portion of the funding. The larger the share of benefits being provided from investment returns, the smaller the required contributions, and vice versa. Determining the contributions required to prefund the promised retirement benefits requires an assumption of what investment earnings are expected to add to the fund over a long period of time. This is called the **Investment Return Assumption**.

The MERS Investment Return Assumption is **7.35%** per year. This, along with all of our other actuarial assumptions, is reviewed at least every five years in an Experience Study that compares the assumptions used against actual experience and recommends adjustments if necessary. If your municipality would like to explore contributions at lower assumed investment return assumptions, please review the "what if" projection scenarios later in this report.

### **Assumption Change in 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 from 7.75% 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.

### **Assumption Change in 2020**





A 5-year experience study analyzing historical experience from 2013 through 2018 was completed in February 2020. In addition to changes to the economic assumptions which will take effect with the Fiscal year 2021 contribution rates, the experience study recommends updated demographic assumptions, including adjustments to the following actuarial assumptions: mortality, retirement, disability, and termination rates. A complete description of the proposed assumptions may be found in the Appendix to the valuation. Changes to the demographic assumptions resulting from the experience study have been approved by the MERS Retirement Board and are to be effective beginning with the December 31, 2020 actuarial valuation first impacting 2022 contributions. This report includes a “What If” scenario of the approved 2020 assumption changes in an effort to show employers the anticipated impact on contribution rates.

## 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 2019 was 4.77%, while the actual market rate of return was 13.41%**. 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, 2019, the actuarial value of assets is 101% of market value due to asset smoothing. This means that meeting the actuarial assumption in the next few years will require average annual market returns that exceed the 7.35% investment return assumption, or contribution requirements will continue to increase.

If the December 31, 2019 valuation results were based on market value instead of actuarial value:

- The funded percent of your entire municipality would be 45% (instead of 46%); and
- Your total employer contribution requirement for the fiscal year starting July 1, 2021 would be \$902,664 (instead of \$893,772).

## 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 demographic assumptions. Lower



investment returns would result in higher required employer contributions, and vice-versa. Alternate demographic assumptions may result in higher or lower employer contributions depending on the demographic characteristics of the plan participants.

The relative impact of the economic and demographic scenarios below will vary from year to year, as the participant demographics change. The impact of each scenario should be analyzed for a given year, not from year to year. The results in the table are based on the December 31, 2019 valuation, and are for the municipality in total, not by division. These results do not reflect a phase in of the impact of the new actuarial assumptions.

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

**In addition to economic assumption changes effective with Fiscal Year 2021 contributions, the Retirement Board has also adopted a change to certain demographic and other assumptions effective for the December 31, 2020 valuation which will impact the Fiscal Year 2022 contributions. Please see the section labeled "Assumption Change in 2020" for more information. The scenario shown using these assumptions as of December 31, 2019 is illustrative only. The actual impact of this change when reflected in the 2020 Annual Actuarial Valuation report will be different.**

12/31/2019 Valuation Results	Assumed Future Annual Smoothed Rate of Investment Return		
	Lower Future Annual Returns <sup>3</sup>	2020 Adopted Demographic Assumptions	Valuation Assumptions
<b>Investment Return Assumption</b>	<b>5.35%</b>	<b>7.35%</b>	<b>7.35%</b>
<b>Wage Increase Assumption</b>	<b>3.00%</b>	<b>3.00%</b>	<b>3.00%</b>
Accrued Liability	\$ 21,402,778	\$ 18,010,753	\$ 17,547,641
Valuation Assets <sup>1</sup>	\$ 7,986,958	\$ 7,986,958	\$ 7,986,958
Unfunded Accrued Liability	\$ 13,415,820	\$ 10,023,795	\$ 9,560,683
<b>Funded Ratio</b>	<b>37%</b>	<b>44%</b>	<b>46%</b>
Monthly Normal Cost	\$ 19,369	\$ 12,036	\$ 11,884
Monthly Amortization Payment	\$ 74,784	\$ 65,745	\$ 62,396
<b>Total Employer Contribution<sup>2</sup></b>	<b>\$ 94,218</b>	<b>\$ 77,958</b>	<b>\$ 74,481</b>

<sup>1</sup> The Valuation Assets include assets from Surplus divisions, if any.

<sup>2</sup> 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.

<sup>3</sup> Based on current demographic assumptions.

## 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 and demographic assumption 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.



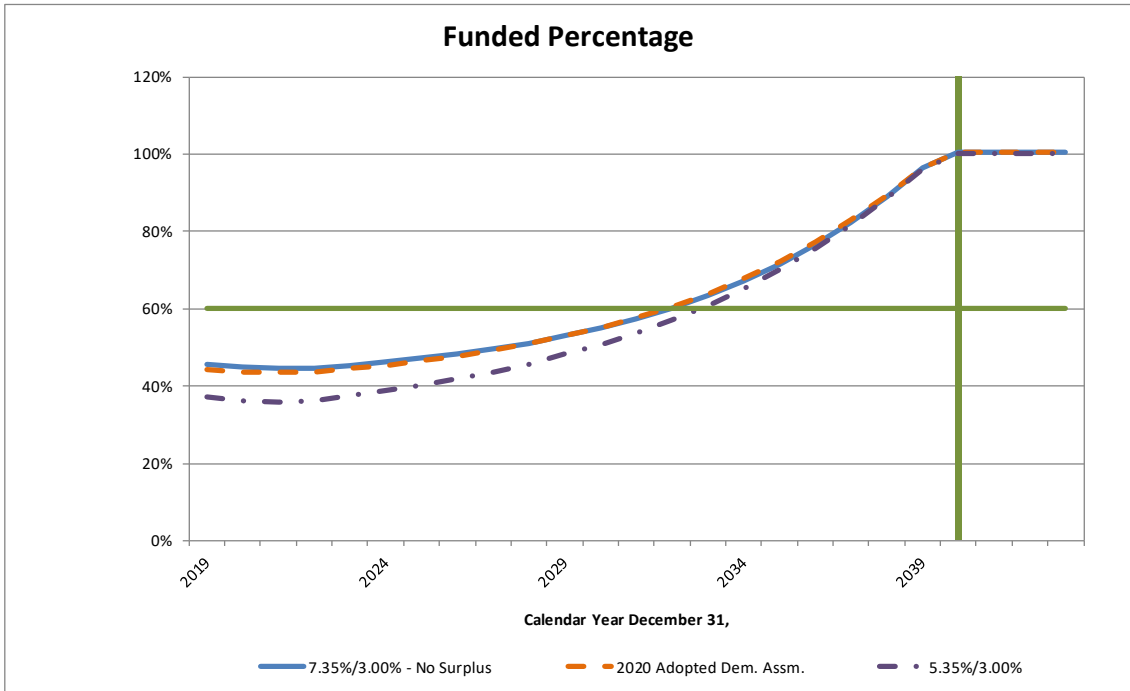
The 7.35%/3.00% scenario provides an estimate of computed employer contributions based on current actuarial assumptions, and a projected 7.35% market return. The other two scenarios may be useful if the municipality chooses to budget more conservatively, and make contributions in addition to the minimum requirements. The 2020 adopted demographic assumption and 5.35%/3.00% projection scenarios provide an indication of the potential required employer contribution if these assumptions were met over the long-term.

Please note that one or more of your divisions trigger the 3 times benefit payout minimum contribution requirement during the projection period (see table following the projections and the graphs). This contribution requirement was designed so that a plan does not run out of money. This means that if assets in the plan are not enough to pay 3 years of benefit payouts, a minimum contribution is required to raise the level of the assets to be equal to at least 3 years of benefit payments. For a full description of this contribution requirement see the Appendix on the MERS website.

Valuation Year Ending 12/31	Fiscal Year Beginning 7/1	Actuarial Accrued Liability	Valuation Assets <sup>2</sup>	Funded Percentage	Computed Annual Employer Contribution
<b>7.35%<sup>1</sup>/3.00% - Current Demographic Assumptions</b>					
<b>NO 5-YEAR PHASE-IN</b>					
2019	2021	\$ 17,547,641	\$ 7,986,958	46%	\$ 893,772
2020	2022	\$ 17,600,000	\$ 7,890,000	45%	\$ 919,000
2021	2023	\$ 17,600,000	\$ 7,850,000	45%	\$ 947,000
2022	2024	\$ 17,600,000	\$ 7,840,000	45%	\$ 983,000
2023	2025	\$ 17,600,000	\$ 7,970,000	45%	\$ 1,010,000
2024	2026	\$ 17,500,000	\$ 8,090,000	46%	\$ 1,030,000
<b>7.35%<sup>1</sup>/3.00% - Adopted 2020 Demographic Assumptions</b>					
<b>NO 5-YEAR PHASE-IN</b>					
2019	2021	\$ 18,010,753	\$ 7,986,958	44%	\$ 935,496
2020	2022	\$ 18,100,000	\$ 7,890,000	44%	\$ 962,000
2021	2023	\$ 18,100,000	\$ 7,870,000	43%	\$ 992,000
2022	2024	\$ 18,100,000	\$ 7,900,000	44%	\$ 1,030,000
2023	2025	\$ 18,200,000	\$ 8,080,000	44%	\$ 1,050,000
2024	2026	\$ 18,200,000	\$ 8,250,000	45%	\$ 1,080,000
<b>5.35%<sup>1</sup>/3.00% - Current Demographic Assumptions</b>					
<b>NO 5-YEAR PHASE-IN</b>					
2019	2021	\$ 21,402,778	\$ 7,986,958	37%	\$ 1,130,616
2020	2022	\$ 21,400,000	\$ 7,740,000	36%	\$ 1,170,000
2021	2023	\$ 21,300,000	\$ 7,660,000	36%	\$ 1,200,000
2022	2024	\$ 21,300,000	\$ 7,730,000	36%	\$ 1,240,000
2023	2025	\$ 21,200,000	\$ 7,970,000	38%	\$ 1,270,000
2024	2026	\$ 21,200,000	\$ 8,200,000	39%	\$ 1,310,000

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

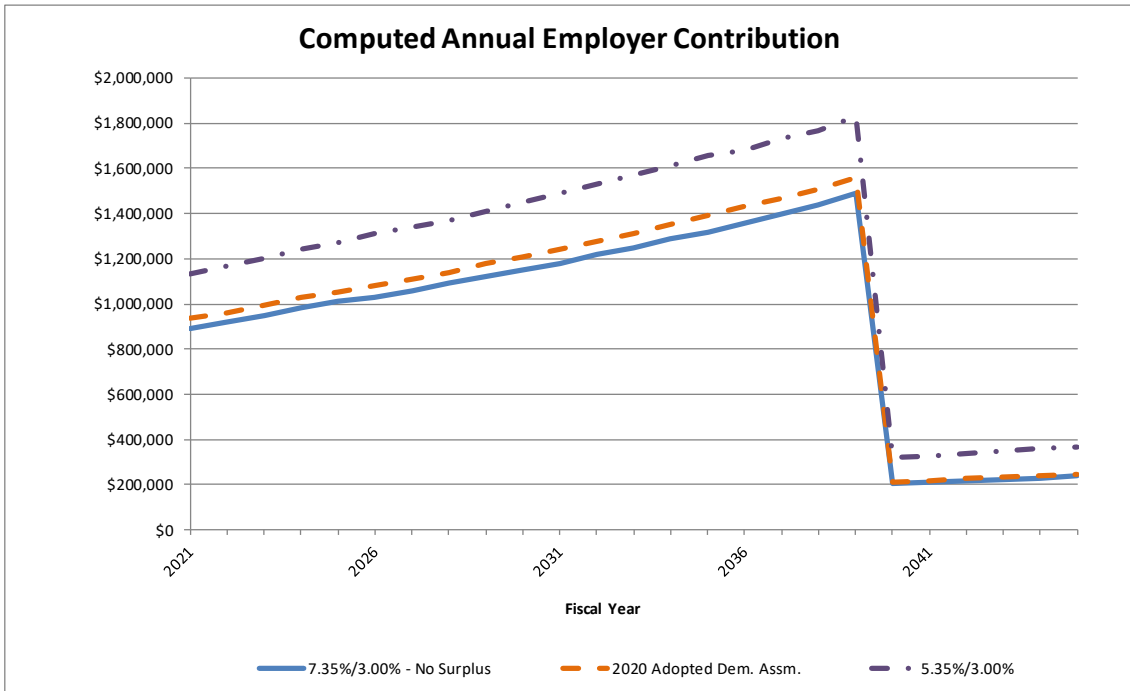
<sup>2</sup> Valuation Assets do not include assets from Surplus divisions, if any.



**Notes:**

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

The green indicator lines have been added at 60% funded and 21 years following the valuation date for PA 202 purposes.



**Notes:**

All projected contributions are shown with no phase-in.

Valuation Year Ending 12/31	Fiscal Year Beginning 7/1	7.35%/3.00% No Phase-In	2020 Dem. Assm. No Phase-In	5.35%/3.00% No Phase-In
2019	2021	12	12	12
2020	2022	12	12	12
2021	2023	12	12	12
2022	2024	12	12	12
2023	2025	12	12	12
2024	2026	12	12	12

This table shows in any given year which division(s) are impacted by the 3 times benefit payout minimum required contribution. If “No” appears in the table, it means none of the divisions are impacted.

## Table 1: Employer Contribution Details For the Fiscal Year Beginning July 1, 2021

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions <sup>1</sup>			Computed Employer Contribut. With Phase-In	Blended ER Rate No Phase-In <sup>5</sup>	Blended ER Rate With Phase-In <sup>5</sup>	Employee Contribut. Conversion Factor <sup>2</sup>
			Employer Normal Cost	Payment of the Unfunded Accrued Liability <sup>4</sup>	Computed Employer Contribut. No Phase-In				
<b>Percentage of Payroll</b>									
01 - General	8.74%	0.00%	-	-	-	-	40.81%	38.83%	
02 - Police	9.83%	2.10%	-	-	-	-	26.92%	25.38%	
05 - Fire FT	0.00%	0.00%	-	-	-	-	-	-	
11 - Dpt Pbhc Srv	7.67%	0.00%	-	-	-	-	31.64%	29.91%	
12 - City Council	9.96%	0.00%	-	-	-	-	119.18%	117.72%	
51 - Fire Vlnmeer	5.49%	3% < ; 5% >	-	-	-	-	-	-	
HA - Dpt of Pub Svs hired af 7/1/07	4.45%	0.00%	4.45%	-0.18%	4.27%	4.32%	31.64%	29.91%	
HB - General hired after 7/1/08	5.38%	0.00%	5.38%	0.16%	5.54%	5.53%	40.81%	38.83%	
HC - Fire FT after 7/1/07	0.00%	0.00%	-	-	-	-	-	-	
HD - Police after 7/01/10	4.31%	0.00%	4.31%	-0.30%	4.01%	4.06%	26.92%	25.38%	
HE - City Cncil aft 1/1/16 -Volntry	5.51%	0.00%	5.51%	0.00%	5.51%	5.51%	119.18%	117.72%	
<b>Estimated Monthly Contribution<sup>3</sup></b>									
01 - General			\$ 2,717	\$ 30,451	\$ 33,168	\$ 31,413			
02 - Police			1,168	13,396	14,564	13,604			
05 - Fire FT			0	4,264	4,264	3,997			
11 - Dpt Pbhc Srv			1,096	14,164	15,260	14,315			
12 - City Council			13	464	477	471			
51 - Fire Vlnmeer			30	(110)	0	0			
HA - Dpt of Pub Svs hired af 7/1/07			1,746	(69)	1,677	1,695			
HB - General hired after 7/1/08			3,125	95	3,220	3,214			
HC - Fire FT after 7/1/07			0	(121)	0	0			
HD - Police after 7/01/10			1,974	(138)	1,836	1,857			
HE - City Cncil aft 1/1/16 -Volntry			15	0	15	15			
<b>Total Municipality</b>			<b>\$ 11,884</b>	<b>\$ 62,396</b>	<b>\$ 74,481</b>	<b>\$ 70,581</b>			
<b>Estimated Annual Contribution<sup>3</sup></b>			<b>\$ 142,608</b>	<b>\$ 748,752</b>	<b>\$ 893,772</b>	<b>\$ 846,972</b>			

<sup>1</sup> The above employer contribution requirements are in addition to the employee contributions, if any.

<sup>2</sup> 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.

<sup>3</sup> 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.



- <sup>4</sup> 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.
- <sup>5</sup> For linked divisions, the employer will be invoiced the Computed Employer Contribution No Phase-in rate shown above for each linked division (a contribution rate for the open division; a contribution dollar for the closed-but-linked division), unless the employer elects to contribute the Blended Employer Contribution rate shown above, by contacting MERS at 800-767-MERS (6377).

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

## Table 2: Benefit Provisions

### 01 - General: Closed to new hires, linked to Division HB

	2019 Valuation	2018 Valuation
<b>Benefit Multiplier:</b>	Bridged Benefit: 2.50% Multiplier (80% max) Frozen FAC; 2.00% Multiplier (no max)	Bridged Benefit:2.50% Multiplier (80% max) Frozen FAC;2.00% Multiplier (no max)
<b>Bridged Benefit Date:</b>	6/30/2011	6/30/2011
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	10 years	10 years
<b>Early Retirement (Unreduced):</b>	55/25	55/25
<b>Early Retirement (Reduced):</b>	50/25 55/15	50/25 55/15
<b>Final Average Compensation:</b>	5 years	5 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

### 02 - Police: Closed to new hires, linked to Division HD

	2019 Valuation	2018 Valuation
<b>Benefit Multiplier:</b>	Bridged Benefit: 2.50% Multiplier (80% max) Frozen FAC; 2.25% Multiplier (80% max)	Bridged Benefit:2.50% Multiplier (80% max) Frozen FAC;2.25% Multiplier (80% max)
<b>Bridged Benefit Date:</b>	8/31/2011	8/31/2011
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	10 years	10 years
<b>Early Retirement (Unreduced):</b>	50/25	50/25
<b>Early Retirement (Reduced):</b>	55/15	55/15
<b>Final Average Compensation:</b>	5 years	5 years
<b>Employee Contributions:</b>	2.10%	2.10%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

### 05 - Fire FT: Closed to new hires

	2019 Valuation	2018 Valuation
<b>Benefit Multiplier:</b>	Bridged Benefit: 2.50% Multiplier (80% max) Frozen FAC; 2.00% Multiplier (no max)	Bridged Benefit:2.50% Multiplier (80% max) Frozen FAC;2.00% Multiplier (no max)
<b>Bridged Benefit Date:</b>	1/31/2011	1/31/2011
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	10 years	10 years
<b>Early Retirement (Unreduced):</b>	55/25	55/25
<b>Early Retirement (Reduced):</b>	50/25 55/15	50/25 55/15
<b>Final Average Compensation:</b>	5 years	5 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)





**11 - Dpt Pblc Srv: Closed to new hires, linked to Division HA**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	Bridged Benefit: 2.50% Multiplier (80% max) Frozen FAC; 2.00% Multiplier (no max)	Bridged Benefit:2.50% Multiplier (80% max) Frozen FAC;2.00% Multiplier (no max)
<b>Bridged Benefit Date:</b>	10/31/2011	10/31/2011
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	10 years	10 years
<b>Early Retirement (Unreduced):</b>	55/25	55/25
<b>Early Retirement (Reduced):</b>	50/25 55/15	50/25 55/15
<b>Final Average Compensation:</b>	5 years	5 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

**12 - City Council: Closed to new hires, linked to Division HE**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	Bridged Benefit: 2.50% Multiplier (80% max) Frozen FAC; 2.00% Multiplier (no max)	Bridged Benefit:2.50% Multiplier (80% max) Frozen FAC;2.00% Multiplier (no max)
<b>Bridged Benefit Date:</b>	6/30/2011	6/30/2011
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	10 years	10 years
<b>Early Retirement (Unreduced):</b>	55/25	55/25
<b>Early Retirement (Reduced):</b>	50/25 55/15	50/25 55/15
<b>Final Average Compensation:</b>	5 years	5 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

**51 - Fire Vlnnter: Closed to new hires**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	Svc x [1.20% x FAC<\$4,200, plus 1.70% x FAC>\$4,200] (no max)	Svc x [1.20% x FAC<\$4,200, plus 1.70% x FAC>\$4,200] (no max)
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	10 years	10 years
<b>Early Retirement (Unreduced):</b>	-	-
<b>Early Retirement (Reduced):</b>	50/25 55/15	50/25 55/15
<b>Final Average Compensation:</b>	5 years	5 years
<b>Employee Contributions:</b>	3.00% under \$4,200; 5.00% over \$4,200	3.00% under \$4,200; 5.00% over \$4,200
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

**HA - Dpt of Pub Svs hired af 7/1/07: Open Division, linked to Division 11**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	1.00% Multiplier (no max)	1.00% Multiplier (no max)
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	6 years	6 years
<b>Early Retirement (Unreduced):</b>	-	-
<b>Early Retirement (Reduced):</b>	-	-
<b>Final Average Compensation:</b>	3 years	3 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

**HB - General hired after 7/1/08: Open Division, linked to Division 01**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	1.00% Multiplier (no max)	1.00% Multiplier (no max)
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	6 years	6 years
<b>Early Retirement (Unreduced):</b>	-	-
<b>Early Retirement (Reduced):</b>	-	-
<b>Final Average Compensation:</b>	3 years	3 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

**HC - Fire FT after 7/1/07: Open Division**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	1.00% Multiplier (no max)	1.00% Multiplier (no max)
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	6 years	6 years
<b>Early Retirement (Unreduced):</b>	-	-
<b>Early Retirement (Reduced):</b>	-	-
<b>Final Average Compensation:</b>	3 years	3 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)

**HD - Police after 7/01/10: Open Division, linked to Division 02**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	1.00% Multiplier (no max)	1.00% Multiplier (no max)
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	6 years	6 years
<b>Early Retirement (Unreduced):</b>	-	-
<b>Early Retirement (Reduced):</b>	-	-
<b>Final Average Compensation:</b>	3 years	3 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	Yes (Adopted 10/26/2015)	Yes (Adopted 10/26/2015)



**HE - City Cncil aft 1/1/16 -Volntry: Open Division, linked to Division 12**

	<b>2019 Valuation</b>	<b>2018 Valuation</b>
<b>Benefit Multiplier:</b>	1.00% Multiplier (no max)	1.00% Multiplier (no max)
<b>Normal Retirement Age:</b>	60	60
<b>Vesting:</b>	6 years	6 years
<b>Early Retirement (Unreduced):</b>	-	-
<b>Early Retirement (Reduced):</b>	-	-
<b>Final Average Compensation:</b>	3 years	3 years
<b>Employee Contributions:</b>	0.00%	0.00%
<b>Act 88:</b>	No	No

### Table 3: Participant Summary

Division	2019 Valuation		2018 Valuation		2019 Valuation		
	Number	Annual Payroll <sup>1</sup>	Number	Annual Payroll <sup>1</sup>	Average Age	Average Benefit Service <sup>2</sup>	Average Eligibility Service <sup>2</sup>
<b>01 - General</b>							
Active Employees	9	\$ 438,592	11	\$ 576,615	54.7	20.0	20.6
Vested Former Employees	7	61,838	7	61,837	52.0	8.3	14.7
Retirees and Beneficiaries	32	607,047	30	538,073	74.5		
Pending Refunds	0		0				
<b>02 - Police</b>							
Active Employees	3	\$ 198,809	4	\$ 247,674	47.8	20.3	20.3
Vested Former Employees	3	51,304	3	51,328	50.5	12.7	21.4
Retirees and Beneficiaries	19	317,578	18	289,916	73.5		
Pending Refunds	0		0				
<b>05 - Fire FT</b>							
Active Employees	0	\$ 0	1	\$ 50,596	0.0	0.0	0.0
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	5	118,277	4	74,755	66.0		
Pending Refunds	0		0				
<b>11 - Dpt Pbhc Srv</b>							
Active Employees	3	\$ 165,238	4	\$ 202,248	46.4	23.4	23.4
Vested Former Employees	3	62,089	3	62,090	47.4	18.0	18.0
Retirees and Beneficiaries	16	313,572	15	287,832	72.3		
Pending Refunds	0		0				
<b>12 - City Council</b>							
Active Employees	1	\$ 2,300	1	\$ 2,300	63.4	11.4	11.4
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	3	7,726	3	7,726	78.5		
Pending Refunds	0		0				
<b>51 - Fire Vlntr</b>							
Active Employees	6	\$ 15,378	7	\$ 20,462	48.3	14.3	14.6
Vested Former Employees	6	2,513	5	1,678	50.0	12.2	13.3
Retirees and Beneficiaries	3	1,631	3	1,631	73.8		
Pending Refunds	15		16				
<b>HA - Dpt of Pub Svs hired af 7/1/07</b>							
Active Employees	11	\$ 431,287	11	\$ 433,802	40.6	4.4	4.8
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				

**Table 3 (continued)**

Division	2019 Valuation		2018 Valuation		2019 Valuation		
	Number	Annual Payroll <sup>1</sup>	Number	Annual Payroll <sup>1</sup>	Average Age	Average Benefit Service <sup>2</sup>	Average Eligibility Service <sup>2</sup>
<b>HB - General hired after 7/1/08</b>							
Active Employees	11	\$ 555,074	10	\$ 468,685	50.1	2.8	3.9
Vested Former Employees	1	4,780	1	4,780	59.3	7.6	7.6
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				
<b>HC - Fire FT after 7/1/07</b>							
Active Employees	0	\$ 0	0	\$ 0	0.0	0.0	0.0
Vested Former Employees	1	1,905	1	1,905	46.2	4.8	20.3
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				
<b>HD - Police after 7/01/10</b>							
Active Employees	10	\$ 479,988	7	\$ 351,380	32.7	1.6	3.6
Vested Former Employees	5	10,027	4	7,229	41.0	3.6	12.1
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				
<b>HE - City Cncl aft 1/1/16 -Volntry</b>							
Active Employees	1	\$ 2,300	1	\$ 2,300	61.4	2.9	2.9
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
Pending Refunds	0		0				
<b>Total Municipality</b>							
Active Employees	55	\$ 2,288,966	57	\$ 2,356,062	45.7	9.2	10.0
Vested Former Employees	26	194,457	24	190,847	48.8	9.8	15.0
Retirees and Beneficiaries	78	1,365,831	73	1,199,933	73.4		
Pending Refunds	15		16				
<b>Total Participants</b>	<b>174</b>		<b>170</b>				

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

<sup>2</sup> Descriptions can be found under Miscellaneous and Technical Assumptions in the Appendix.

## Table 4: Reported Assets (Market Value)

Division	2019 Valuation		2018 Valuation	
	Employer and Retiree <sup>1</sup>	Employee <sup>2</sup>	Employer and Retiree <sup>1</sup>	Employee <sup>2</sup>
01 - General	\$ 2,988,210	\$ 7,784	\$ 2,895,114	\$ 7,662
02 - Police	1,998,809	29,544	1,891,793	41,229
05 - Fire FT	575,277	0	543,944	23,259
11 - Dpt Pblc Srv	1,747,501	38,607	1,680,180	49,105
12 - City Council	13,952	73	14,782	72
51 - Fire Vlntr	46,032	17,243	38,897	18,544
HA - Dpt of Pub Svs hired af 7/1/07	149,334	0	117,391	0
HB - General hired after 7/1/08	149,214	0	109,471	0
HC - Fire FT after 7/1/07	17,848	0	15,728	0
HD - Police after 7/01/10	103,099	0	72,062	0
HE - City Cncil aft 1/1/16 -Volntry	542	0	290	0
<b>Municipality Total<sup>3</sup></b>	<b>\$ 7,789,817</b>	<b>\$ 93,250</b>	<b>\$ 7,379,653</b>	<b>\$ 139,871</b>
<b>Combined Assets<sup>3</sup></b>	<b>\$7,883,067</b>		<b>\$7,519,524</b>	

<sup>1</sup> Reserve for Employer Contributions and Benefit Payments.

<sup>2</sup> Reserve for Employee Contributions.

<sup>3</sup> Totals may not add due to rounding.

The December 31, 2019 valuation assets (actuarial value of assets) are equal to 1.013179 times the reported market value of assets (compared to 1.095342 as of December 31, 2018). Refer to the Appendix for a description of the valuation asset derivation and a detailed calculation of valuation assets.

### Table 5: Flow of Valuation Assets

Year Ended 12/31	Employer Contributions		Employee Contributions	Investment Income (Valuation Assets)	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
	Required	Additional						
2009	\$ 442,866		\$ 9,804	\$ 325,782	\$ (846,304)	\$ (412)	\$ (2,075)	\$ 9,223,821
2010	458,911		8,809	410,751	(932,997)	0	0	9,169,295
2011	456,280	\$ 0	4,656	398,992	(981,373)	0	0	9,047,850
2012	412,447	110,000	9,272	341,883	(1,078,739)	0	0	8,842,713
2013	448,213	110,000	8,630	466,942	(1,089,562)	(1,903)	0	8,785,033
2014	488,213	110,000	8,466	473,375	(1,122,956)	0	0	8,742,131
2015	523,390	110,000	7,266	402,518	(1,128,342)	(22,517)	0	8,634,446
2016	567,651	150,000	5,649	404,019	(1,164,203)	0	0	8,597,562
2017	609,436	0	5,784	480,509	(1,223,752)	0	0	8,469,539
2018	638,128	0	7,647	295,757	(1,174,619)	0	0	8,236,452
2019	677,236	0	5,717	358,596	(1,290,204)	(839)	0	7,986,958

**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, 2019**

Division	Actuarial Accrued Liability					Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
	Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total			
01 - General	\$ 1,557,265	\$ 434,076	\$ 5,715,192	\$ 0	\$ 7,706,533	\$ 3,035,477	39.4%	\$ 4,671,056
02 - Police	744,796	352,508	3,009,309	0	4,106,613	2,055,085	50.0%	2,051,528
05 - Fire FT	0	0	1,232,478	0	1,232,478	582,859	47.3%	649,619
11 - Dpt Pblc Srv	601,716	314,350	3,076,783	0	3,992,849	1,809,647	45.3%	2,183,202
12 - City Council	4,907	0	48,618	0	53,525	14,209	26.6%	39,316
51 - Fire Vlnkeer	20,028	13,914	14,617	4,389	52,948	64,109	121.1%	(11,161)
HA - Dpt of Pub Svs hired af 7/1/07	144,902	0	0	0	144,902	151,302	104.4%	(6,400)
HB - General hired after 7/1/08	112,484	49,598	0	0	162,082	151,180	93.3%	10,902
HC - Fire FT after 7/1/07	0	7,588	0	0	7,588	18,084	238.3%	(10,496)
HD - Police after 7/01/10	52,749	34,860	0	0	87,609	104,457	119.2%	(16,848)
HE - City Cncil aft 1/1/16 -Volntry	514	0	0	0	514	549	106.8%	(35)
<b>Total</b>	<b>\$ 3,239,361</b>	<b>\$ 1,206,894</b>	<b>\$ 13,096,997</b>	<b>\$ 4,389</b>	<b>\$ 17,547,641</b>	<b>\$ 7,986,958</b>	<b>45.5%</b>	<b>\$ 9,560,683</b>



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

**Table 6 (continued)**

Division	Actuarial Accrued Liability					Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
	Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total			
Linked Divisions HA, 11	\$ 746,618	\$ 314,350	\$ 3,076,783	\$ 0	\$ 4,137,751	\$ 1,960,949	47.4%	\$ 2,176,802
Linked Divisions HB, 01	1,669,749	483,674	5,715,192	0	7,868,615	3,186,657	40.5%	4,681,958
Linked Divisions HD, 02	797,545	387,368	3,009,309	0	4,194,222	2,159,542	51.5%	2,034,680
Linked Divisions HE, 12	5,421	0	48,618	0	54,039	14,758	27.3%	39,281

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
2005	\$ 12,273,095	\$ 8,441,080	69%	\$ 3,832,015
2006	12,967,213	8,831,735	68%	4,135,478
2007	13,435,723	9,216,984	69%	4,218,739
2008	14,139,867	9,294,160	66%	4,845,707
2009	14,320,650	9,223,821	64%	5,096,829
2010	14,677,293	9,169,295	62%	5,507,998
2011	14,403,069	9,047,850	63%	5,355,219
2012	14,666,667	8,842,713	60%	5,823,954
2013	14,930,370	8,785,033	59%	6,145,337
2014	15,294,232	8,742,131	57%	6,552,101
2015	16,073,035	8,634,446	54%	7,438,589
2016	16,343,213	8,597,562	53%	7,745,651
2017	16,543,931	8,469,539	51%	8,074,392
2018	16,439,540	8,236,452	50%	8,203,088
2019	17,547,641	7,986,958	46%	9,560,683

Notes: Actuarial assumptions were revised for the 2008, 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

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

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

Throughout this report are references to valuation results generated prior to the 2018 valuation date. Results prior to 2018 were received directly from the prior actuary or extracted from the previous valuation system by MERS's technology service provider.

## Tables 8 and 9: Division-Based Comparative Schedules

### Division 01 - General

**Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 5,297,949	\$ 3,313,767	63%	\$ 1,984,182
2010	5,329,898	3,193,137	60%	2,136,761
2011	6,004,064	3,594,754	60%	2,409,310
2012	6,238,364	3,576,063	57%	2,662,301
2013	6,356,564	3,525,378	56%	2,831,186
2014	6,576,344	3,511,230	53%	3,065,114
2015	6,974,937	3,432,544	49%	3,542,393
2016	7,136,584	3,395,672	48%	3,740,912
2017	7,155,296	3,315,855	46%	3,839,441
2018	7,218,435	3,179,533	44%	4,038,902
2019	7,706,533	3,035,477	39%	4,671,056

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-01: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	18	\$ 779,925	\$ 16,106	0.00%
2010	16	685,089	\$ 15,959	0.00%
2011	17	754,145	\$ 16,870	0.00%
2012	17	787,189	\$ 18,634	0.00%
2013	17	800,324	\$ 19,807	0.00%
2014	17	821,890	\$ 21,868	0.00%
2015	17	782,441	\$ 25,436	0.00%
2016	15	753,180	\$ 26,689	0.00%
2017	11	554,903	\$ 26,413	0.00%
2018	11	576,615	\$ 28,353	0.00%
2019	9	438,592	\$ 33,168	0.00%

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

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

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

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

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

## Division 02 - Police

**Table 8-02: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 4,387,559	\$ 3,142,000	72%	\$ 1,245,559
2010	4,605,907	3,189,512	69%	1,416,395
2011	3,680,471	2,646,291	72%	1,034,180
2012	3,582,397	2,468,694	69%	1,113,703
2013	3,672,819	2,425,864	66%	1,246,955
2014	3,723,154	2,346,582	63%	1,376,572
2015	3,800,988	2,286,527	60%	1,514,461
2016	3,919,395	2,230,635	57%	1,688,760
2017	3,979,585	2,168,645	55%	1,810,940
2018	3,801,320	2,117,321	56%	1,683,999
2019	4,106,613	2,055,085	50%	2,051,528

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-02: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	14	\$ 787,643	18.75%	0.00%
2010	12	680,343	21.62%	0.00%
2011	10	549,923	\$ 8,340	1.56%
2012	8	455,647	\$ 8,531	1.56%
2013	8	470,611	\$ 9,676	1.56%
2014	7	431,435	\$ 10,277	1.56%
2015	6	356,132	\$ 10,912	1.56%
2016	5	290,315	\$ 11,873	1.56%
2017	5	297,053	\$ 12,748	2.10%
2018	4	247,674	\$ 11,695	2.10%
2019	3	198,809	\$ 14,564	2.10%

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.

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

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

## Division 05 - Fire FT

**Table 8-05: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 1,022,758	\$ 656,955	64%	\$ 365,803
2010	1,038,731	654,835	63%	383,896
2011	1,107,802	656,969	59%	450,833
2012	1,149,037	657,403	57%	491,634
2013	1,139,401	661,894	58%	477,507
2014	1,126,048	662,133	59%	463,915
2015	1,172,742	648,081	55%	524,661
2016	1,166,923	645,480	55%	521,443
2017	1,157,218	639,564	55%	517,654
2018	1,137,378	621,281	55%	516,097
2019	1,232,478	582,859	47%	649,619

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-05: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	2	\$ 116,102	\$ 2,375	6.40%
2010	2	114,363	\$ 2,407	6.40%
2011	1	53,639	\$ 2,488	0.00%
2012	1	46,352	\$ 2,595	0.00%
2013	1	48,531	\$ 2,583	0.00%
2014	1	50,198	\$ 2,586	0.00%
2015	1	48,786	\$ 3,129	0.00%
2016	1	49,233	\$ 3,142	0.00%
2017	1	49,993	\$ 3,181	0.00%
2018	1	50,596	\$ 3,264	0.00%
2019	0	0	\$ 4,264	0.00%

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

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

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

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 11 - Dpt Pblc Srv

**Table 8-11: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 3,499,167	\$ 2,042,809	58%	\$ 1,456,358
2010	3,576,716	2,056,194	57%	1,520,522
2011	3,468,631	2,065,413	60%	1,403,218
2012	3,544,371	2,036,227	57%	1,508,144
2013	3,583,339	2,034,216	57%	1,549,123
2014	3,669,992	2,042,488	56%	1,627,504
2015	3,896,592	2,035,400	52%	1,861,192
2016	3,837,888	2,033,855	53%	1,804,033
2017	3,904,951	1,987,344	51%	1,917,607
2018	3,859,691	1,894,159	49%	1,965,532
2019	3,992,849	1,809,647	45%	2,183,202

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-11: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	11	\$ 497,435	\$ 10,825	0.00%
2010	11	487,938	\$ 10,795	0.00%
2011	9	408,298	\$ 9,202	0.00%
2012	8	367,932	\$ 9,775	0.00%
2013	8	375,141	\$ 10,293	0.00%
2014	7	349,846	\$ 10,828	0.00%
2015	7	336,785	\$ 12,756	0.00%
2016	5	249,944	\$ 11,830	0.00%
2017	4	201,536	\$ 12,627	0.00%
2018	4	202,248	\$ 13,254	0.00%
2019	3	165,238	\$ 15,260	0.00%

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

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

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

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 12 - City Council

**Table 8-12: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 59,344	\$ 15,563	26%	\$ 43,781
2010	58,479	12,403	21%	46,076
2011	57,084	8,333	15%	48,751
2012	56,269	5,268	9%	51,001
2013	55,674	3,499	6%	52,175
2014	55,208	5,145	9%	50,063
2015	57,935	14,022	24%	43,913
2016	57,485	13,857	24%	43,628
2017	56,235	14,901	27%	41,334
2018	54,182	16,270	30%	37,912
2019	53,525	14,209	27%	39,316

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-12: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	2	\$ 4,600	61.96%	1.00%
2010	2	4,600	62.95%	1.00%
2011	2	4,600	65.73%	0.00%
2012	2	4,800	72.11%	0.00%
2013	2	4,600	76.88%	0.00%
2014	3	6,900	49.53%	0.00%
2015	2	4,600	\$ 1,073	0.00%
2016	1	2,300	\$ 350	0.00%
2017	1	2,300	\$ 509	0.00%
2018	1	2,300	\$ 708	0.00%
2019	1	2,300	\$ 477	0.00%

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

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

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

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 51 - Fire VInteer

**Table 8-51: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 44,792	\$ 45,220	101%	\$ (428)
2010	45,320	46,018	102%	(698)
2011	46,552	47,498	102%	(946)
2012	49,468	49,286	100%	182
2013	47,270	50,914	108%	(3,644)
2014	46,013	54,042	117%	(8,029)
2015	46,393	56,591	122%	(10,198)
2016	51,289	58,996	115%	(7,707)
2017	56,451	61,518	109%	(5,067)
2018	54,132	62,918	116%	(8,786)
2019	52,948	64,109	121%	(11,161)

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-51: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	16	\$ 31,631	2.29%	3.26%
2010	16	40,953	2.71%	3.27%
2011	16	40,263	\$ 64	3.25%
2012	14	36,096	\$ 70	3.26%
2013	12	36,017	\$ 26	3.45%
2014	11	31,447	\$ 0	3.40%
2015	11	24,851	\$ 0	3.18%
2016	11	28,450	\$ 0	3% < ; 5% >
2017	9	28,530	\$ 21	3% < ; 5% >
2018	7	20,462	\$ 0	3% < ; 5% >
2019	6	15,378	\$ 0	3% < ; 5% >

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.

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 HA - Dpt of Pub Svs hired af 7/1/07

**Table 8-HA: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 2,198	\$ 2,677	122%	\$ (479)
2010	6,005	5,477	91%	528
2011	11,523	9,452	82%	2,071
2012	19,404	17,041	88%	2,363
2013	31,581	27,624	88%	3,957
2014	47,705	44,198	93%	3,507
2015	55,588	62,427	112%	(6,839)
2016	67,090	87,708	131%	(20,618)
2017	90,343	108,437	120%	(18,094)
2018	121,881	128,584	105%	(6,703)
2019	144,902	151,302	104%	(6,400)

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-HA: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	2	\$ 57,123	4.47%	0.00%
2010	2	63,871	4.56%	0.00%
2011	4	105,774	4.34%	0.00%
2012	3	105,256	4.44%	0.00%
2013	6	198,551	4.41%	0.00%
2014	7	249,314	4.37%	0.00%
2015	6	222,012	3.87%	0.00%
2016	7	269,502	3.53%	0.00%
2017	10	378,089	3.76%	0.00%
2018	11	433,802	4.01%	0.00%
2019	11	431,287	4.27%	0.00%

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

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

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

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 HB - General hired after 7/1/08

**Table 8-HB: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 3,181	\$ 1,541	48%	\$ 1,640
2010	8,719	5,726	66%	2,993
2011	15,864	10,222	64%	5,642
2012	24,776	18,605	75%	6,171
2013	35,650	33,596	94%	2,054
2014	33,470	45,145	135%	(11,675)
2015	40,530	57,268	141%	(16,738)
2016	55,122	72,280	131%	(17,158)
2017	86,176	95,228	111%	(9,052)
2018	121,777	119,908	98%	1,869
2019	162,082	151,180	93%	10,902

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-HB: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	3	\$ 96,065	5.28%	0.00%
2010	2	80,235	5.43%	0.00%
2011	2	82,375	5.63%	0.00%
2012	3	119,166	5.51%	0.00%
2013	3	118,905	5.31%	0.00%
2014	3	115,070	4.70%	0.00%
2015	5	173,714	4.76%	0.00%
2016	6	238,581	4.47%	0.00%
2017	9	405,930	4.97%	0.00%
2018	10	468,685	5.33%	0.00%
2019	11	555,074	5.54%	0.00%

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

<sup>2</sup> 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.

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 HC - Fire FT after 7/1/07

**Table 8-HC: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 3,702	\$ 3,289	89%	\$ 413
2010	7,518	5,993	80%	1,525
2011	11,078	8,918	81%	2,160
2012	2,927	11,400	390%	(8,473)
2013	4,097	13,346	326%	(9,249)
2014	4,429	14,140	319%	(9,711)
2015	5,221	14,880	285%	(9,659)
2016	5,629	15,712	279%	(10,083)
2017	6,070	16,601	274%	(10,531)
2018	6,461	17,227	267%	(10,766)
2019	7,588	18,084	238%	(10,496)

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-HC: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	1	\$ 27,148	5.06%	0.00%
2010	1	40,108	5.20%	0.00%
2011	0	0	0.00%	0.00%
2012	0	0	0.00%	0.00%
2013	0	0	0.00%	0.00%
2014	0	0	0.00%	0.00%
2015	0	0	0.00%	0.00%
2016	0	0	0.00%	0.00%
2017	0	0	0.00%	0.00%
2018	0	0	0.00%	0.00%
2019	0	0	\$ 0	0.00%

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

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

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

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 HD - Police after 7/01/10

**Table 8-HD: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 0	\$ 0	0%	\$ 0
2010	0	0	0%	0
2011	0	0	0%	0
2012	(346)	2,726	0%	(3,072)
2013	3,975	8,702	219%	(4,727)
2014	11,869	17,028	144%	(5,159)
2015	22,109	26,706	121%	(4,597)
2016	45,808	43,367	95%	2,441
2017	51,454	61,289	119%	(9,835)
2018	63,975	78,933	123%	(14,958)
2019	87,609	104,457	119%	(16,848)

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-HD: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	0	\$ 0	\$ 0	0.00%
2010	0	0	\$ 0	0.00%
2011	0	0	\$ 0	0.00%
2012	2	73,768	4.84%	0.00%
2013	2	88,069	4.26%	0.00%
2014	4	195,314	4.55%	0.00%
2015	4	188,480	4.47%	0.00%
2016	6	305,317	4.92%	0.00%
2017	5	246,632	4.83%	0.00%
2018	7	351,380	4.58%	0.00%
2019	10	479,988	4.01%	0.00%

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

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

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

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 HE - City Cncil aft 1/1/16 -Volntry

**Table 8-HE: Actuarial Accrued Liabilities - Comparative Schedule**

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2009	\$ 0	\$ 0	0%	\$ 0
2010	0	0	0%	0
2011	0	0	0%	0
2012	0	0	0%	0
2013	0	0	0%	0
2014	0	0	0%	0
2015	0	0	0%	0
2016	0	0	0%	0
2017	152	157	103%	(5)
2018	308	318	103%	(10)
2019	514	549	107%	(35)

Notes: Actuarial assumptions were revised for the 2009, 2010, 2011, 2012, 2015 and 2019 actuarial valuations.

**Table 9-HE: Computed Employer Contributions - Comparative Schedule**

Valuation Date December 31	Active Employees		Computed Employer Contribution <sup>1</sup>	Employee Contribution Rate <sup>2</sup>
	Number	Annual Payroll		
2009	0	\$ 0	\$ 0	0.00%
2010	0	0	\$ 0	0.00%
2011	0	0	\$ 0	0.00%
2012	0	0	\$ 0	0.00%
2013	0	0	\$ 0	0.00%
2014	0	0	\$ 0	0.00%
2015	0	0	\$ 0	0.00%
2016	0	0	\$ 0	0.00%
2017	1	2,509	5.48%	0.00%
2018	1	2,300	5.42%	0.00%
2019	1	2,300	5.51%	0.00%

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

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

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

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 - General

**Table 10-01: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ 3,542,393	23	\$ 3,750,000	19	\$ 289,188
(Gain)/Loss	12/31/2016	112,363	22	127,360	19	9,828
(Gain)/Loss	12/31/2017	36,794	21	41,429	19	3,192
(Gain)/Loss	12/31/2018	160,697	20	180,121	19	13,896
(Gain)/Loss	12/31/2019	344,763	19	383,463	19	29,568
Assumption	12/31/2019	253,658	19	255,914	19	19,740
<b>Total</b>				<b>\$ 4,738,287</b>		<b>\$ 365,412</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

## Division 02 - Police

**Table 10-02: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ 1,514,461	23	\$ 1,583,594	19	\$ 122,124
(Gain)/Loss	12/31/2016	148,892	22	168,766	19	13,020
(Gain)/Loss	12/31/2017	97,935	21	110,257	19	8,508
Amendment	12/31/2017	(1,981)	21	(2,224)	19	(168)
(Gain)/Loss	12/31/2018	(154,207)	20	(172,848)	19	(13,332)
(Gain)/Loss	12/31/2019	219,726	19	244,391	19	18,852
Assumption	12/31/2019	147,037	19	152,258	19	11,748
<b>Total</b>				<b>\$ 2,084,194</b>		<b>\$ 160,752</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 valuation to take into account the expected future contributions that are based on past valuations. Each type of UAL (layer) is amortized over the appropriate period. Please see the Appendix on the MERS website for a detailed description of the amortization policy.

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

## Division 05 - Fire FT

**Table 10-05: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ 524,661	23	\$ 554,443	19	\$ 42,756
(Gain)/Loss	12/31/2016	(14,423)	22	(16,342)	19	(1,260)
(Gain)/Loss	12/31/2017	(11,169)	21	(12,577)	19	(972)
(Gain)/Loss	12/31/2018	(4,583)	20	(5,137)	19	(396)
(Gain)/Loss	12/31/2019	93,135	19	103,590	19	7,992
Assumption	12/31/2019	38,747	19	39,461	19	3,048
<b>Total</b>				<b>\$ 663,438</b>		<b>\$ 51,168</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ 1,861,192	23	\$ 1,965,220	19	\$ 151,548
(Gain)/Loss	12/31/2016	(101,112)	22	(114,598)	19	(8,832)
(Gain)/Loss	12/31/2017	97,137	21	109,376	19	8,436
(Gain)/Loss	12/31/2018	28,781	20	32,256	19	2,484
(Gain)/Loss	12/31/2019	56,868	19	63,252	19	4,884
Assumption	12/31/2019	144,351	19	148,494	19	11,448
<b>Total</b>				<b>\$ 2,204,000</b>		<b>\$ 169,968</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 - City Council

**Table 10-12: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ 43,913	23	\$ 23,605	19	\$ 1,824
(Gain)/Loss	12/31/2016	(578)	22	(647)	19	(48)
(Gain)/Loss	12/31/2017	2,438	21	2,739	19	216
(Gain)/Loss	12/31/2018	2,058	20	2,306	19	180
(Gain)/Loss	12/31/2019	2,570	19	2,858	19	3,324
Assumption	12/31/2019	1,063	19	975	19	72
<b>Total</b>				<b>\$ 31,836</b>		<b>\$ 5,568</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 51 - Fire VInteer

**Table 10-51: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ (10,198)	10	\$ (8,573)	10	\$ (1,068)
(Gain)/Loss	12/31/2016	2,786	10	2,569	7	432
(Gain)/Loss	12/31/2017	2,182	10	2,175	8	324
(Gain)/Loss	12/31/2018	(4,478)	10	(4,762)	9	(648)
(Gain)/Loss	12/31/2019	(3,914)	10	(4,353)	10	(540)
Assumption	12/31/2019	1,254	10	1,469	10	180
<b>Total</b>				<b>\$ (11,475)</b>		<b>\$ (1,320)</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 HA - Dpt of Pub Svs hired af 7/1/07

**Table 10-HA: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ (6,839)	10	\$ (6,772)	10	\$ (840)
(Gain)/Loss	12/31/2016	(12,900)	15	(13,579)	12	(1,452)
(Gain)/Loss	12/31/2017	3,897	15	4,207	13	420
(Gain)/Loss	12/31/2018	11,123	15	12,259	14	1,176
(Gain)/Loss	12/31/2019	(2,206)	15	(2,454)	15	(228)
Assumption	12/31/2019	877	15	1,015	15	96
<b>Total</b>				<b>\$ (5,324)</b>		<b>\$ (828)</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 HB - General hired after 7/1/08

**Table 10-HB: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
(Gain)/Loss	12/31/2018	\$ 3,905	15	\$ 4,308	14	\$ 408
(Gain)/Loss	12/31/2019	3,721	15	4,139	15	372
Assumption	12/31/2019	3,547	15	3,898	15	360
<b>Total</b>				<b>\$ 12,345</b>		<b>\$ 1,140</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 HC - Fire FT after 7/1/07

**Table 10-HC: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
Initial	12/31/2015	\$ (9,659)	10	\$ (10,001)	10	\$ (1,236)
(Gain)/Loss	12/31/2016	325	15	333	12	36
(Gain)/Loss	12/31/2017	333	15	356	13	36
(Gain)/Loss	12/31/2018	(120)	15	(132)	14	(12)
(Gain)/Loss	12/31/2019	(2,688)	10	(2,990)	10	(372)
Assumption	12/31/2019	621	10	760	10	96
<b>Total</b>				<b>\$ (11,674)</b>		<b>\$ (1,452)</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 HD - Police after 7/01/10

**Table 10-HD: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
(Gain)/Loss	12/31/2017	\$ (9,895)	15	\$ (10,689)	13	\$ (1,080)
(Gain)/Loss	12/31/2018	(4,461)	15	(4,916)	14	(468)
(Gain)/Loss	12/31/2019	(3,753)	15	(4,174)	15	(384)
Assumption	12/31/2019	2,678	15	3,095	15	276
<b>Total</b>				<b>\$ (16,684)</b>		<b>\$ (1,656)</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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 HE - City Cncil aft 1/1/16 -Volntry

**Table 10-HE: Layered Amortization Schedule**

Type of UAL	Date Established	Original Balance <sup>1</sup>	Original Amortization Period <sup>2</sup>	Amounts for Fiscal Year Beginning 7/1/2021		
				Outstanding UAL Balance <sup>3</sup>	Remaining Amortization Period <sup>2</sup>	Annual Amortization Payment
(Gain)/Loss	12/31/2017	(4)	15	(5)	13	0
(Gain)/Loss	12/31/2018	(5)	15	(6)	14	0
(Gain)/Loss	12/31/2019	(35)	15	(39)	15	0
Assumption	12/31/2019	9	15	11	15	0
<b>Total</b>				<b>\$ (39)</b>		<b>\$ -</b>

<sup>1</sup> For each type of UAL (layer), this is the original balance as of the date the layer was established.

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

<sup>3</sup> 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, 2019 (see Table 6) is projected to the beginning of the fiscal year for which the contributions are being calculated. This allows the 2019 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:		12/31/2019
Measurement Date of the Total Pension Liability (TPL):		12/31/2019
At 12/31/2019, the following employees were covered by the benefit terms:		
Inactive employees or beneficiaries currently receiving benefits:		78
Inactive employees entitled to but not yet receiving benefits (including refunds):		41
Active employees:		<u>55</u>
		174
Total Pension Liability as of 12/31/2018 measurement date:	\$	16,069,624
Total Pension Liability as of 12/31/2019 measurement date:	\$	17,188,972
Service Cost for the year ending on the 12/31/2019 measurement date:	\$	134,899
Change in the Total Pension Liability due to:		
- Benefit changes <sup>1</sup> :	\$	0
- Differences between expected and actual experience <sup>2</sup> :	\$	478,489
- Changes in assumptions <sup>2</sup> :	\$	557,681
Average expected remaining service lives of all employees (active and inactive):		3

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

<sup>2</sup> Changes in liability due to differences between actual and expected experience, and changes in assumptions, are recognized in pension expense over the average remaining service lives of all employees.

Covered employee payroll: (Needed for Required Supplementary Information)	\$	2,288,966
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Sensitivity of the Net Pension Liability to changes in the discount rate:

	1% Decrease <u>(6.60%)</u>	Current Discount Rate <u>(7.60%)</u>	1% Increase <u>(8.60%)</u>
Change in Net Pension Liability as of 12/31/2019:	\$ 1,711,822	\$ -	\$ (1,459,682)

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

12/1/2016	Service Credit Purchase Estimates - No
10/26/2015	Covered by Act 88
7/1/2011	Benefit B-2
6/30/2011	Frozen FAC
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)
7/1/2001	Benefit B-4 (80% max)
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)
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1997	E 2% COLA Adopted (01/01/1997)
1/1/1996	E 2% COLA Adopted (01/01/1996)
1/1/1995	E 2% COLA Adopted (01/01/1995)
1/1/1994	E 2% COLA Adopted (01/01/1994)
1/1/1993	E 2% COLA Adopted (01/01/1993)
1/1/1992	Member Contribution Rate 0.00%
1/1/1992	E 2% COLA Adopted (01/01/1992)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	Benefit B-2
1/1/1990	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)
7/1/1986	Benefit C-2/Base B-1
7/1/1986	Benefit F55 (With 25 Years of Service)
4/1/1986	Member Contribution Rate 1.00%
1/1/1986	E 2% COLA Adopted (01/01/1986)
1/1/1985	E 2% COLA Adopted (01/01/1985)
1/1/1984	E 2% COLA Adopted (01/01/1984)
1/1/1983	E 2% COLA Adopted (01/01/1983)
1/1/1982	E 2% COLA Adopted (01/01/1982)
1/1/1981	E 2% COLA Adopted (01/01/1981)
1/1/1980	E 2% COLA Adopted (01/01/1980)
1/1/1979	E 2% COLA Adopted (01/01/1979)
1/1/1978	E 2% COLA Adopted (01/01/1978)
9/12/1977	Exclude Temporary Employees
1/1/1977	E 2% COLA Adopted (01/01/1977)



## 01 - General

1/1/1976	E 2% COLA Adopted (01/01/1976)
1/1/1971	E 2% COLA Adopted (01/01/1971)
1/1/1967	Benefit C-1 (Old)
1/1/1957	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1957	10 Year Vesting
1/1/1957	Benefit C (Old)
1/1/1957	Member Contribution Rate 3.00% Under \$4,200.00 - Then 5.00%
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

## 02 - Police

7/1/2017	Participant Contribution Rate 2.10%
12/1/2016	Service Credit Purchase Estimates - No
10/26/2015	Covered by Act 88
9/1/2011	Benefit B-3 (80% max)
9/1/2011	Member Contribution Rate 1.56%
8/31/2011	Frozen FAC
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)
7/1/2000	Benefit B-4 (80% max)
1/1/2000	E 2% COLA Adopted (01/01/2000)
1/1/1999	Flexible E 2% COLA Adopted (01/01/1999)
3/1/1998	Temporary Benefit B-4 (80% max) (03/01/1998 - 07/02/1998)
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1997	E 2% COLA Adopted (01/01/1997)
1/1/1996	E 2% COLA Adopted (01/01/1996)
1/1/1995	E 2% COLA Adopted (01/01/1995)
1/1/1994	E 2% COLA Adopted (01/01/1994)
1/1/1993	E 2% COLA Adopted (01/01/1993)
1/1/1992	E 2% COLA Adopted (01/01/1992)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	E 2% COLA Adopted (01/01/1990)
7/1/1989	Benefit B-2
1/1/1989	Member Contribution Rate 0.00%
1/1/1989	E 2% COLA Adopted (01/01/1989)
7/1/1988	Member Contribution Rate 3.00%
1/1/1988	Benefit F50 (With 25 Years of Service)
1/1/1988	Member Contribution Rate 5.00%
1/1/1988	E 2% COLA Adopted (01/01/1988)
1/1/1987	E 2% COLA Adopted (01/01/1987)
1/1/1986	E 2% COLA Adopted (01/01/1986)
1/1/1985	E 2% COLA Adopted (01/01/1985)
1/1/1984	E 2% COLA Adopted (01/01/1984)

## 02 - Police

7/1/1983	Benefit C-2/Base B-1
7/1/1983	Member Contribution Rate 8.00%
1/1/1983	E 2% COLA Adopted (01/01/1983)
1/1/1982	E 2% COLA Adopted (01/01/1982)
1/1/1981	E 2% COLA Adopted (01/01/1981)
6/1/1980	Benefit F55 (With 25 Years of Service)
1/1/1980	E 2% COLA Adopted (01/01/1980)
1/1/1979	E 2% COLA Adopted (01/01/1979)
1/1/1978	E 2% COLA Adopted (01/01/1978)
9/12/1977	Exclude Temporary Employees
1/1/1977	E 2% COLA Adopted (01/01/1977)
1/1/1976	E 2% COLA Adopted (01/01/1976)
1/1/1971	E 2% COLA Adopted (01/01/1971)
1/1/1967	Benefit C-1 (Old)
1/1/1957	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1957	10 Year Vesting
1/1/1957	Benefit C (Old)
1/1/1957	Member Contribution Rate 3.00% Under \$4,200.00 - Then 5.00%
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

## 05 - Fire FT

12/1/2016	Service Credit Purchase Estimates - No
10/26/2015	Covered by Act 88
2/1/2011	Benefit B-2
2/1/2011	Member Contribution Rate 0.00%
1/31/2011	Frozen FAC
1/1/2007	E 2% COLA Adopted (01/01/2007)
1/1/2006	E 2% COLA Adopted (01/01/2006)
12/1/2005	Benefit B-4 (80% max)
12/1/2005	Member Contribution Rate 6.40%
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)
3/1/1998	Temporary 2.5% Multiplier (no max) (03/01/1998 - 07/02/1998)
3/1/1998	Temporary Benefit F55 (With 20 Years of Service) (03/01/1998 - 07/02/1998)
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1997	E 2% COLA Adopted (01/01/1997)
1/1/1996	E 2% COLA Adopted (01/01/1996)
1/1/1995	E 2% COLA Adopted (01/01/1995)
1/1/1994	E 2% COLA Adopted (01/01/1994)
7/1/1993	Benefit F55 (With 25 Years of Service)
1/1/1993	E 2% COLA Adopted (01/01/1993)
7/1/1992	Benefit B-2

## 05 - Fire FT

1/1/1992	E 2% COLA Adopted (01/01/1992)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	E 2% COLA Adopted (01/01/1990)
1/1/1989	E 2% COLA Adopted (01/01/1989)
7/1/1988	Member Contribution Rate 0.00%
1/1/1988	E 2% COLA Adopted (01/01/1988)
1/1/1987	E 2% COLA Adopted (01/01/1987)
1/1/1986	E 2% COLA Adopted (01/01/1986)
1/1/1985	E 2% COLA Adopted (01/01/1985)
1/1/1984	E 2% COLA Adopted (01/01/1984)
1/1/1983	E 2% COLA Adopted (01/01/1983)
1/1/1982	E 2% COLA Adopted (01/01/1982)
1/1/1981	E 2% COLA Adopted (01/01/1981)
1/1/1980	E 2% COLA Adopted (01/01/1980)
1/1/1979	E 2% COLA Adopted (01/01/1979)
1/1/1978	E 2% COLA Adopted (01/01/1978)
9/12/1977	Exclude Temporary Employees
1/1/1977	E 2% COLA Adopted (01/01/1977)
1/1/1976	E 2% COLA Adopted (01/01/1976)
1/1/1971	E 2% COLA Adopted (01/01/1971)
1/1/1967	Benefit C-1 (Old)
1/1/1957	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1957	10 Year Vesting
1/1/1957	Benefit C (Old)
1/1/1957	Member Contribution Rate 3.00% Under \$4,200.00 - Then 5.00%
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

## 11 - Dpt Pblc Srv

12/1/2016	Service Credit Purchase Estimates - No
10/26/2015	Covered by Act 88
11/1/2011	Benefit B-2
10/31/2011	Frozen FAC
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)
7/1/2002	Member Contribution Rate 0.00%
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)
1/1/1998	Member Contribution Rate 3.00%
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1997	Member Contribution Rate 4.00%
1/1/1997	E 2% COLA Adopted (01/01/1997)
1/1/1996	Benefit B-4 (80% max)

## 11 - Dpt Pblc Srv

1/1/1996	Benefit F55 (With 25 Years of Service)
1/1/1996	Member Contribution Rate 5.00%
1/1/1996	E 2% COLA Adopted (01/01/1996)
1/1/1995	E 2% COLA Adopted (01/01/1995)
1/1/1994	E 2% COLA Adopted (01/01/1994)
1/1/1993	E 2% COLA Adopted (01/01/1993)
7/1/1992	Member Contribution Rate 0.00%
1/1/1992	E 2% COLA Adopted (01/01/1992)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	E 2% COLA Adopted (01/01/1990)
7/1/1989	Benefit B-2
7/1/1989	Member Contribution Rate 1.00%
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)
7/1/1986	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/1986	10 Year Vesting
7/1/1986	Benefit C-2/Base B-1
1/1/1986	E 2% COLA Adopted (01/01/1986)
1/1/1985	E 2% COLA Adopted (01/01/1985)
1/1/1984	E 2% COLA Adopted (01/01/1984)
1/1/1983	E 2% COLA Adopted (01/01/1983)
1/1/1982	E 2% COLA Adopted (01/01/1982)
1/1/1981	E 2% COLA Adopted (01/01/1981)
1/1/1980	E 2% COLA Adopted (01/01/1980)
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

## 12 - City Council

12/1/2016	Service Credit Purchase Estimates - No
10/26/2015	Covered by Act 88
7/1/2011	Benefit B-2
7/1/2011	Member Contribution Rate 0.00%
6/30/2011	Frozen FAC
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	Benefit B-4 (80% max)
1/1/2000	E 2% COLA Adopted (01/01/2000)
1/1/1999	Flexible E 2% COLA Adopted (01/01/1999)
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1997	E 2% COLA Adopted (01/01/1997)
1/1/1996	E 2% COLA Adopted (01/01/1996)
1/1/1995	E 2% COLA Adopted (01/01/1995)

## 12 - City Council

1/1/1994	E 2% COLA Adopted (01/01/1994)
1/1/1993	E 2% COLA Adopted (01/01/1993)
1/1/1992	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1992	10 Year Vesting
1/1/1992	Benefit B-2
1/1/1992	Benefit F55 (With 25 Years of Service)
1/1/1992	Member Contribution Rate 1.00%
1/1/1992	E 2% COLA Adopted (01/01/1992)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	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)
1/1/1986	E 2% COLA Adopted (01/01/1986)
1/1/1985	E 2% COLA Adopted (01/01/1985)
1/1/1984	E 2% COLA Adopted (01/01/1984)
1/1/1983	E 2% COLA Adopted (01/01/1983)
1/1/1982	E 2% COLA Adopted (01/01/1982)
1/1/1981	E 2% COLA Adopted (01/01/1981)
1/1/1980	E 2% COLA Adopted (01/01/1980)
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

## 51 - Fire Vlnteer

12/1/2016	Service Credit Purchase Estimates - No
10/26/2015	Covered by Act 88
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)
1/1/1998	E 2% COLA Adopted (01/01/1998)
1/1/1997	E 2% COLA Adopted (01/01/1997)
1/1/1996	E 2% COLA Adopted (01/01/1996)
1/1/1995	E 2% COLA Adopted (01/01/1995)
1/1/1994	E 2% COLA Adopted (01/01/1994)
1/1/1993	E 2% COLA Adopted (01/01/1993)
1/1/1992	E 2% COLA Adopted (01/01/1992)
1/1/1991	E 2% COLA Adopted (01/01/1991)
1/1/1990	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)
1/1/1986	E 2% COLA Adopted (01/01/1986)

## 51 - Fire VInteer

1/1/1985	E 2% COLA Adopted (01/01/1985)
1/1/1984	E 2% COLA Adopted (01/01/1984)
1/1/1983	E 2% COLA Adopted (01/01/1983)
1/1/1982	E 2% COLA Adopted (01/01/1982)
1/1/1981	E 2% COLA Adopted (01/01/1981)
1/1/1980	E 2% COLA Adopted (01/01/1980)
1/1/1957	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1957	10 Year Vesting
1/1/1957	Benefit C-1 (Old)
1/1/1957	Member Contribution Rate 3.00% Under \$4,200.00 - Then 5.00%
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

## HA - Dpt of Pub Svs hired af 7/1/07

10/26/2015	Covered by ACT 88
9/1/2008	Benefit FAC-3 (3 Year Final Average Compensation)
9/1/2008	6 Year Vesting
9/1/2008	1.0% Multiplier
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	No Early Reduced Conditions

## HB - General hired after 7/1/08

10/26/2015	Covered by ACT 88
9/1/2008	Benefit FAC-3 (3 Year Final Average Compensation)
9/1/2008	6 Year Vesting
9/1/2008	1.0% Multiplier
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	No Early Reduced Conditions

## HC - Fire FT after 7/1/07

10/26/2015	Covered by ACT 88
2/1/2009	Benefit FAC-3 (3 Year Final Average Compensation)
2/1/2009	6 Year Vesting
2/1/2009	1.0% Multiplier
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	No Early Reduced Conditions

## HD - Police after 7/01/10

10/26/2015	Covered by ACT 88
7/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2010	6 Year Vesting
7/1/2010	1.0% Multiplier
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	No Early Reduced Conditions





## HE - City Cncil aft 1/1/16 -Volntry

1/1/2016	Day of work defined as 1 hour a month (elected city councils)
1/1/2016	Benefit FAC-3 (3 Year Final Average Compensation)
1/1/2016	6 Year Vesting
1/1/2016	1.0% Multiplier
1/1/1957	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	No Early Reduced Conditions

# 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	1.00%

### Withdrawal Rate Scaling Factor

Division	Withdrawal Rate Scaling Factor
All Divisions	100%

## Miscellaneous and Technical Assumptions

Loads – None.

### Amortization Policy for Closed Divisions

Closed Division	Amortization Option
05 - Fire FT	Non-Accelerated Amortization

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

## Risk Commentary

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

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

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

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

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

## PLAN MATURITY MEASURES

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

	<u>12/31/2019</u>	<u>12/31/2018</u>
1. Ratio of the market value of assets to total payroll	3.4	3.2
2. Ratio of actuarial accrued liability to payroll	7.7	7.0
3. Ratio of actives to retirees and beneficiaries	0.7	0.8
4. Ratio of market value of assets to benefit payments	6.1	6.4
5. Ratio of net cash flow to market value of assets (boy)	-8.1%	-6.3%

### **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](http://www.mersofmich.com) and on the State [website](#).

Form 5572		
Line Reference	Description	Result
<b>10</b>	<b>Membership as of December 31, 2019</b>	
11	Indicate number of active members	55
12	Indicate number of inactive members (excluding pending refunds)	26
13	Indicate number of retirees and beneficiaries	78
<b>14</b>	<b>Investment Performance for Calendar Year Ending December 31, 2019<sup>1</sup></b>	
15	Enter actual rate of return - prior 1-year period	14.02%
16	Enter actual rate of return - prior 5-year period	6.39%
17	Enter actual rate of return - prior 10-year period	7.97%
<b>18</b>	<b>Actuarial Assumptions</b>	
19	Actuarial assumed rate of investment return <sup>2</sup>	7.35%
20	Amortization method utilized for funding the system's unfunded actuarial accrued liability, if any	Level Percent
21	Amortization period utilized for funding the system's unfunded actuarial accrued liability, if any <sup>3</sup>	19
22	Is each division within the system closed to new employees? <sup>4</sup>	No
<b>23</b>	<b>Uniform Assumptions</b>	
24	Enter retirement pension system's actuarial value of assets using uniform assumptions	\$7,940,700
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions	\$18,636,434
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending June 30, 2020	\$938,664

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 investment expenses on a rolling calendar-year basis for the previous 1-, 5-, and 10-year periods as required under PA 530.
2. Net of administrative and investment expenses.
3. Populated with the longest amortization period remaining in the amortization schedule, across all divisions in the plan. This is when each division and the plan in total is expected to reach 100% funded if all assumptions are met.
4. If all divisions within the employer are closed, “yes.” If at least one division is open (including shadow divisions) indicate “no.”