



Municipal Employees' Retirement System of Michigan

Annual Actuarial Valuation Report
December 31, 2018 - Battle Creek City of (1302)





Spring, 2019

Battle Creek 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 Battle Creek City of (1302) as of December 31, 2018. The report includes the determination of liabilities and contribution rates resulting from the participation in the Municipal Employees' Retirement System of Michigan ("MERS"). This report contains the minimum actuarially determined contribution requirement, in alignment with the MERS Plan Document, Actuarial Policy, and the Michigan Constitution and governing statutes. Battle Creek City of is responsible for the employer contributions needed to provide MERS benefits for its employees and former employees.

The purposes of this valuation are to:

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

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

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

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

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

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

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

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of Battle Creek 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.



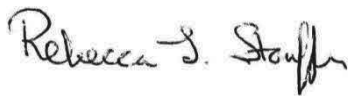
This report was prepared at the request of the MERS Retirement Board and may be provided only in its entirety by the municipality to other interested parties (MERS customarily provides the full report on request to associated third parties such as the auditor for the municipality). GRS is not responsible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

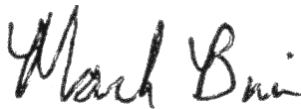
Sincerely,



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.

	12/31/2018	12/31/2017
Funded Ratio*	58%	60%

* Reflects assets from Surplus divisions, if any.

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

Required Employer Contributions:

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

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

	Percentage of Payroll				Monthly \$ Based on Projected Payroll			
	Phase-in	No Phase-in	Phase-in	No Phase-in	Phase-in	No Phase-in	Phase-in	No Phase-in
Valuation Date:	12/31/2018	12/31/2018	12/31/2017	12/31/2017	12/31/2018	12/31/2018	12/31/2017	12/31/2017
Fiscal Year Beginning:	July 1, 2020	July 1, 2020	July 1, 2019	July 1, 2019	July 1, 2020	July 1, 2020	July 1, 2019	July 1, 2019
Division								
01 - Gnrl NonUn.	33.62%	34.32%	33.12%	34.66%	\$ 149,230	\$ 152,358	\$ 138,318	\$ 144,734
10 - General AFSCME	-	-	-	-	88,154	91,171	79,681	85,715
11 - Gnrl Transit	-	-	-	-	19,182	19,739	19,021	20,135
12 - Gnrl BCSA	-	-	-	-	99,454	101,346	82,258	86,042
13 - Gnrl Housing	-	-	-	-	12,874	13,308	11,059	11,927
14 - SEIU Local	-	-	-	-	72,878	75,459	67,078	72,286
15 - City Mngr.	201.41%	201.41%	143.67%	143.67%	50,349	50,349	35,172	35,172
16 - Cntrl Disp.	-	-	-	-	3,172	3,327	1,982	2,292
17 - Corr.Offrcs	0.00%	0.00%	0.00%	0.00%	0	0	0	0
18 - General AFSCME after 12/1/10	5.23%	5.29%	5.13%	5.26%	18,180	18,382	15,351	15,755
19 - Gen. SEIU hired after 7/1/2011	4.28%	4.30%	4.68%	4.73%	10,682	10,735	10,174	10,290
20 - Gen. BCSA hired after 1/1/2012	6.47%	6.51%	5.41%	5.50%	3,798	3,822	2,884	2,932
HA - GNL Trans hired after 3/1/10	6.25%	6.29%	6.47%	6.56%	6,721	6,767	6,327	6,419
Municipality Total					\$ 534,674	\$ 546,763	\$ 469,305	\$ 493,699

Employee contribution rates:

Valuation Date:	Employee Contribution Rate	
	12/31/2018	12/31/2017
Division		
01 - Gnrl NonUn.	5.00%	4.00%
10 - General AFSCME	2.75%	2.75%
11 - Gnrl Transit	2.50%	2.50%
12 - Gnrl BCSA	5.16%	5.16%
13 - Gnrl Housing	1.50%	1.50%
14 - SEIU Local	3.50%	3.00%
15 - City Mngr.	0.00%	0.00%
16 - Cntrl Disp.	7.20%	7.20%
17 - Corr.Offrcs	3.12%	3.12%
18 - General AFSCME after 12/1/10	2.50%	2.50%
19 - Gen. SEIU hired after 7/1/2011	3.50%	3.00%
20 - Gen. BCSA hired after 1/1/2012	2.50%	2.50%
HA - GNL Trans hired after 3/1/10	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 2020 for the entire employer would be \$796,160, instead of \$546,763.

How and Why Do These Numbers Change?

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

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

Comments on Investment Rate of Return Assumption

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

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

Assumption Change in 2019

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

Comments on Asset Smoothing

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

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

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

- The funded percent of your entire municipality would be 53% (instead of 58%); and
- Your total employer contribution requirement for the fiscal year starting July 1, 2020 would be \$7,187,460 (instead of \$6,561,156)

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

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

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

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

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

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

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

12/31/2018 Valuation Results	Assumed Future Annual Smoothed Rate of Investment Return		
	Lower Future Annual Returns	Adopted 2019 Assumption	Valuation Assumptions
Investment Return Assumption	5.75%	7.35%	7.75%
Wage Increase Assumption	3.75%	3.00%	3.75%
Accrued Liability	\$ 184,094,383	\$ 155,575,060	\$ 151,060,394
Valuation Assets ¹	\$ 87,380,611	\$ 87,380,611	\$ 87,380,611
Unfunded Accrued Liability	\$ 96,713,772	\$ 68,194,449	\$ 63,679,783
Funded Ratio	47%	56%	58%
Monthly Normal Cost	\$ 234,718	\$ 129,851	\$ 132,162
Monthly Amortization Payment	\$ 531,395	\$ 452,251	\$ 413,355
Total Employer Contribution²	\$ 766,113	\$ 583,185	\$ 546,763

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

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

Projection Scenarios

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

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

Your municipality includes one or more Surplus divisions. The assets in a Surplus division may be used to reduce future employer contributions or to accelerate the date by which the municipality becomes 100% funded. The timing and use of these Surplus assets is discretionary.

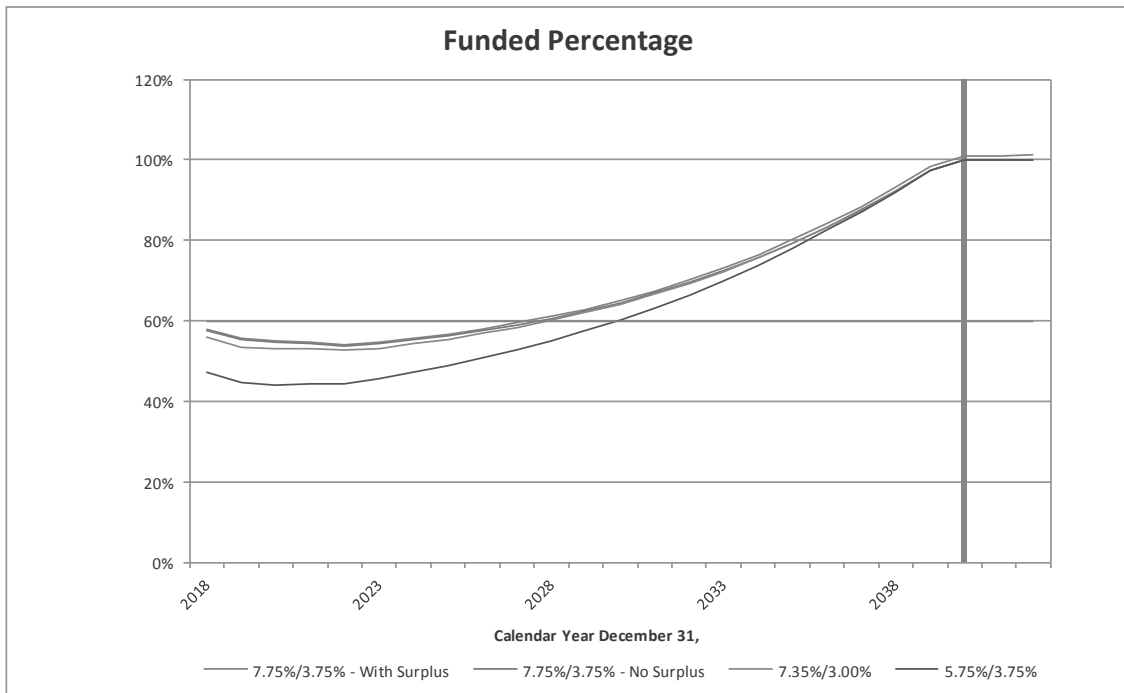
The Funded Percentage graph shows projections of funded status under the 7.75% investment return assumption, both including the Surplus assets (contributed as of the valuation date), and without the Surplus assets. The graph including the Surplus assets assumes these Surplus assets grow with interest and are not used to lower future employer contributions. We modeled the projections including the Surplus assets in this fashion because the use of these assets is discretionary by the employer and we do not know when and how the employer will use them. Once the employer uses these Surplus assets, any future employer contributions are expected to be lower than those shown in the projections.

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 ²	Funded Percentage	Computed Annual Employer Contribution
7.75%¹/3.75%					
NO 5-YEAR PHASE-IN					
2018	2020	\$ 151,060,394	\$ 86,964,523	58%	\$ 6,561,156
2019	2021	\$ 153,500,000	\$ 84,800,000	55%	\$ 6,950,000
2020	2022	\$ 156,100,000	\$ 85,400,000	55%	\$ 7,270,000
2021	2023	\$ 158,400,000	\$ 86,200,000	54%	\$ 7,620,000
2022	2024	\$ 160,700,000	\$ 86,500,000	54%	\$ 8,050,000
2023	2025	\$ 162,700,000	\$ 88,300,000	54%	\$ 8,360,000
7.35%¹/3.00%					
NO 5-YEAR PHASE-IN					
2018	2020	\$ 155,575,060	\$ 86,964,523	56%	\$ 6,998,220
2019	2021	\$ 157,800,000	\$ 84,500,000	54%	\$ 7,360,000
2020	2022	\$ 160,000,000	\$ 85,000,000	53%	\$ 7,640,000
2021	2023	\$ 162,000,000	\$ 85,800,000	53%	\$ 7,970,000
2022	2024	\$ 163,800,000	\$ 86,200,000	53%	\$ 8,360,000
2023	2025	\$ 165,400,000	\$ 88,000,000	53%	\$ 8,630,000
5.75%¹/3.75%					
NO 5-YEAR PHASE-IN					
2018	2020	\$ 184,094,383	\$ 86,964,523	47%	\$ 9,193,356
2019	2021	\$ 186,800,000	\$ 83,100,000	44%	\$ 9,670,000
2020	2022	\$ 189,500,000	\$ 83,500,000	44%	\$ 10,100,000
2021	2023	\$ 192,000,000	\$ 85,400,000	44%	\$ 10,500,000
2022	2024	\$ 194,400,000	\$ 86,400,000	44%	\$ 11,000,000
2023	2025	\$ 196,700,000	\$ 90,000,000	46%	\$ 11,400,000

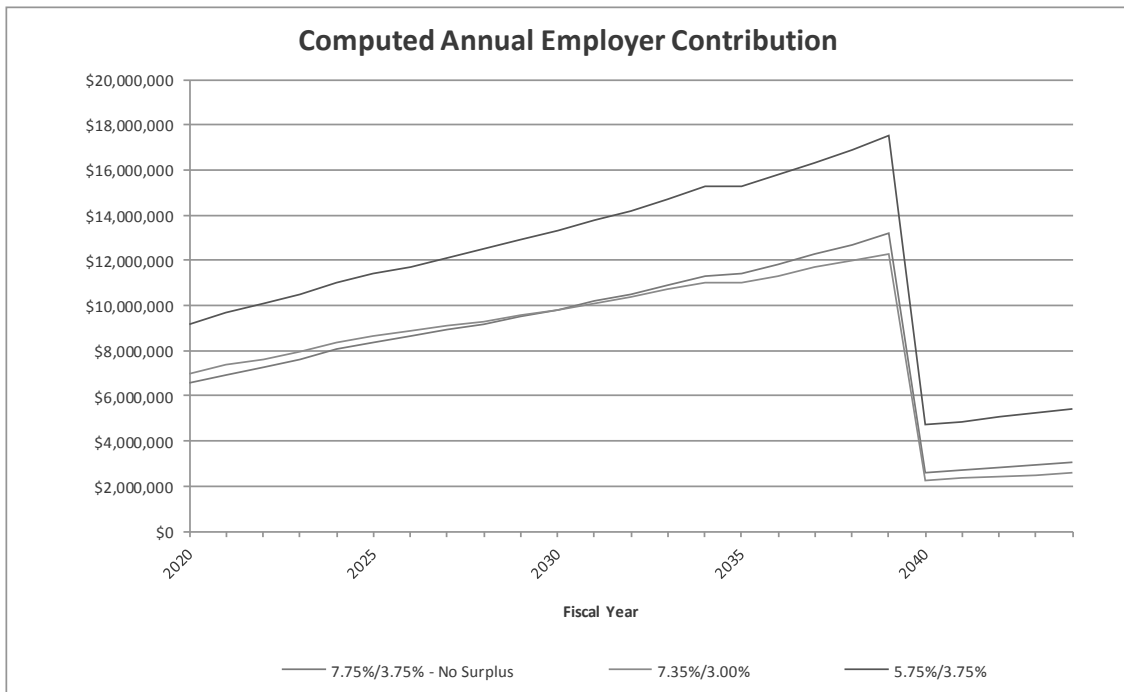
¹ Represents both the interest rate for discounting liabilities and the future investment return assumption on the Market Value of assets.

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



Notes:

All projected funded percentages are shown with no phase-in.
 Assumes assets from Surplus divisions will not be used to lower employer contributions during the projection period.
 The green indicator lines have been added at 60% funded and 22 years following the valuation date for PA 202 purposes.



Notes:

All projected contributions are shown with no phase-in.
 Projected employer contributions do not reflect the use of any assets from the Surplus divisions.

Valuation Year Ending 12/31	Fiscal Year Beginning 7/1	7.75%/3.75% No Phase-In	7.35%/3.00% No Phase-In	5.75%/3.75% No Phase-In
2018	2020	15	15	15
2019	2021	15	15	15
2020	2022	15	15	15
2021	2023	15	15	15
2022	2024	15	15	No
2023	2025	15	15	No

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, 2020

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions ¹			Computed Employer Contribut. With Phase-In	Blended ER Rate No Phase-In ⁵	Blended ER Rate With Phase-In ⁵	Employee Contribut. Conversion Factor ²
			Employer Normal Cost	Payment of the Unfunded Accrued Liability ⁴	Computed Employer Contribut. No Phase-In				
Percentage of Payroll									
01 - Gnrl NonUn.	13.61%	5.00%	8.61%	25.71%	34.32%	33.62%	20.80%	20.19%	0.87%
10 - General AFSCME	12.77%	2.75%	-	-	-	-	19.79%	19.34%	
11 - Gnl Transit	13.31%	2.50%	-	-	-	-	55.81%	54.80%	
12 - Gnrl BCSA	13.48%	5.16%	-	-	-	-	-	-	
13 - Gnl Housing	15.79%	1.50%	-	-	-	-	-	-	
14 - SEIU Local	13.20%	3.50%	-	-	-	-	22.72%	22.03%	
15 - City Mngr.	16.68%	0.00%	16.68%	184.73%	201.41%	201.41%	-	-	0.93%
16 - Cntrl Disp.	0.00%	7.20%	-	-	-	-	-	-	
17 - Corr.Offrcs	10.67%	3.12%	7.55%	-17.84%	0.00%	0.00%	20.80%	20.19%	0.97%
18 - General AFSCME after 12/1/10	7.55%	2.50%	5.05%	0.24%	5.29%	5.23%	22.72%	22.03%	0.93%
19 - Gen. SEIU hired after 7/1/2011	7.58%	3.50%	4.08%	0.22%	4.30%	4.28%	55.81%	54.80%	0.91%
20 - Gen. BCSA hired after 1/1/2012	9.01%	2.50%	6.51%	0.00%	6.51%	6.47%	-	-	0.83%
Estimated Monthly Contribution³									
01 - Gnrl NonUn.			\$ 38,220	\$ 114,138	\$ 152,358	\$ 149,230			
10 - General AFSCME			17,953	73,218	91,171	88,154			
11 - Gnl Transit			2,855	16,884	19,739	19,182			
12 - Gnrl BCSA			10,793	90,553	101,346	99,454			
13 - Gnl Housing			6,032	7,276	13,308	12,874			
14 - SEIU Local			12,552	62,907	75,459	72,878			
15 - City Mngr.			4,170	46,179	50,349	50,349			
16 - Cntrl Disp.			0	3,327	3,327	3,172			
17 - Corr.Offrcs			914	(2,160)	0	0			
18 - General AFSCME after 12/1/10			17,547	835	18,382	18,180			
19 - Gen. SEIU hired after 7/1/2011			10,196	539	10,735	10,682			
20 - Gen. BCSA hired after 1/1/2012			3,822	0	3,822	3,798			

Table 1 (continued)

Division	Total Normal Cost	Employee Contribut. Rate	Employer Contributions ¹			Computed Employer Contribut. With Phase-In	Blended ER Rate No Phase-In ⁵	Blended ER Rate With Phase-In ⁵	Employee Contribut. Conversion Factor ²
			Employer Normal Cost	Payment of the Unfunded Accrued Liability ⁴	Computed Employer Contribut. No Phase-In				
Percentage of Payroll									
HA - GNL Trans hired after 3/1/10	6.61%	0.00%	6.61%	-0.32%	6.29%	6.25%	19.79%	19.34%	0.93%
Estimated Monthly Contribution³									
HA - GNL Trans hired after 3/1/10			\$ 7,108	\$ (341)	\$ 6,767	\$ 6,721			
Total Municipality			\$ 132,162	\$ 413,355	\$ 546,763	\$ 534,674			
Estimated Annual Contribution³			\$ 1,585,944	\$ 4,960,260	\$ 6,561,156	\$ 6,416,088			

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

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

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

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

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

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

Table 2: Benefit Provisions

01 - Gnrl NonUn.: Open Division

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	5.00%	4.00%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

10 - General AFSCME: Closed to new hires, linked to Division 18

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	2.75%	2.75%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

11 - Gnl Transit: Closed to new hires, linked to Division HA

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	2.50%	2.50%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

12 - Gnrl BCSA: Closed to new hires, linked to Division 20

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	5.16%	5.16%
RS50% Percentage:	50%	50%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

13 - Gnl Housing: Closed to new hires

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	1.50%	1.50%
DC Plan for New Hires:	12/1/2013	12/1/2013
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

14 - SEIU Local: Closed to new hires, linked to Division 19

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25	50/25
	55/15	55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	3.50%	3.00%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

15 - City Mngr.: Open Division

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	50/25 55/15	50/25 55/15
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
Employee Contributions:	0.00%	0.00%
RS50% Percentage:	50%	50%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

16 - Cntrl Disp.: Closed to new hires

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.50% Multiplier (80% max)	2.50% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	3 years	3 years
COLA for Future Retirees:	2.50% (Non-Compound)	2.50% (Non-Compound)
Employee Contributions:	7.20%	7.20%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

17 - Corr.Offrcs: Open Division

	2018 Valuation	2017 Valuation
Benefit Multiplier:	2.25% Multiplier (80% max)	2.25% Multiplier (80% max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	55/25	55/25
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	3.12%	3.12%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

18 - General AFSCME after 12/1/10: Open Division, linked to Division 10

	2018 Valuation	2017 Valuation
Benefit Multiplier:	1.50% Multiplier (no max)	1.50% Multiplier (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	2.50%	2.50%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

19 - Gen. SEIU hired after 7/1/2011: Open Division, linked to Division 14

	2018 Valuation	2017 Valuation
Benefit Multiplier:	1.50% Multiplier (no max)	1.50% Multiplier (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	5 years	5 years
Employee Contributions:	3.50%	3.00%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

20 - Gen. BCSA hired after 1/1/2012: Open Division, linked to Division 12

	2018 Valuation	2017 Valuation
Benefit Multiplier:	1.50% Multiplier (no max)	1.50% Multiplier (no max)
Normal Retirement Age:	60	60
Vesting:	10 years	10 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	50/25 55/15	50/25 55/15
Final Average Compensation:	3 years	3 years
Employee Contributions:	2.50%	2.50%
Act 88:	Yes (Adopted 7/10/1973)	Yes (Adopted 7/10/1973)

HA - GNL Trans hired after 3/1/10: Open Division, linked to Division 11

	2018 Valuation	2017 Valuation
Benefit Multiplier:	1.25% Multiplier (no max)	Hybrid Plan - 1.25% Multiplier
Normal Retirement Age:	60	60
Vesting:	6 years	6 years
Early Retirement (Unreduced):	-	-
Early Retirement (Reduced):	-	-
Final Average Compensation:	3 years	3 years
Employee Contributions:	0.00%	0.00%
Act 88:	Yes (Adopted 7/10/1983)	Yes (Adopted 7/10/1983)

Table 3: Participant Summary

Division	2018 Valuation		2017 Valuation		2018 Valuation		
	Number	Annual Payroll ¹	Number	Annual Payroll ¹	Average Age	Average Benefit Service ²	Average Eligibility Service ²
01 - Gnrl NonUn.							
Active Employees	63	\$ 4,857,655	62	\$ 4,569,675	47.5	11.3	12.6
Vested Former Employees	13	278,723	14	299,213	51.2	11.1	14.8
Retirees and Beneficiaries	90	2,514,083	90	2,423,124	73.8		
10 - General AFSCME							
Active Employees	43	\$ 2,310,685	52	\$ 2,534,173	51.0	18.6	18.9
Vested Former Employees	7	111,704	6	94,361	49.7	12.4	14.8
Retirees and Beneficiaries	139	2,726,839	137	2,642,747	68.8		
11 - Gnl Transit							
Active Employees	8	\$ 388,202	11	\$ 568,014	56.3	16.8	16.8
Vested Former Employees	1	19,700	1	19,700	58.0	17.0	17.0
Retirees and Beneficiaries	34	626,247	32	564,890	66.8		
12 - Gnrl BCSA							
Active Employees	22	\$ 1,739,995	22	\$ 1,636,242	51.3	19.9	19.9
Vested Former Employees	4	66,404	4	66,404	54.9	13.1	17.7
Retirees and Beneficiaries	42	1,647,981	38	1,453,260	67.6		
13 - Gnl Housing							
Active Employees	9	\$ 570,602	9	\$ 581,402	54.9	17.1	17.1
Vested Former Employees	1	23,380	1	23,380	55.8	18.6	18.6
Retirees and Beneficiaries	7	261,563	7	256,704	73.8		
14 - SEIU Local							
Active Employees	34	\$ 1,735,412	41	\$ 2,046,849	53.1	16.8	17.0
Vested Former Employees	10	109,328	10	109,511	51.4	11.6	14.6
Retirees and Beneficiaries	95	2,263,649	93	2,166,383	68.5		
15 - City Mngr.							
Active Employees	2	\$ 273,550	2	\$ 267,898	53.7	7.0	8.9
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	9	522,214	9	522,213	66.6		
16 - Cntrl Disp.							
Active Employees	0	\$ 0	0	\$ 0	0.0	0.0	0.0
Vested Former Employees	4	40,279	5	53,928	54.8	9.4	13.8
Retirees and Beneficiaries	5	118,356	4	105,783	60.6		
17 - Corr.Offrcs							
Active Employees	2	\$ 132,460	2	\$ 118,639	31.7	5.4	5.4
Vested Former Employees	3	26,176	4	35,257	45.0	6.1	18.3
Retirees and Beneficiaries	2	36,310	1	28,471	61.8		

Table 3 (continued)

Division	2018 Valuation		2017 Valuation		2018 Valuation		
	Number	Annual Payroll ¹	Number	Annual Payroll ¹	Average Age	Average Benefit Service ²	Average Eligibility Service ²
18 - General AFSCME after 12/1/10							
Active Employees	74	\$ 3,452,289	64	\$ 2,873,816	40.3	3.5	4.8
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	1	2,649	1	2,649	63.6		
19 - Gen. SEIU hired after 7/1/2011							
Active Employees	57	\$ 2,415,318	50	\$ 1,987,507	40.0	3.5	4.2
Vested Former Employees	1	2,266	1	2,266	53.9	3.1	4.7
Retirees and Beneficiaries	0	0	0	0	0.0		
20 - Gen. BCSA hired after 1/1/2012							
Active Employees	5	\$ 321,977	3	\$ 217,191	58.9	3.1	7.4
Vested Former Employees	0	0	0	0	0.0	0.0	0.0
Retirees and Beneficiaries	0	0	0	0	0.0		
HA - GNL Trans hired after 3/1/10							
Active Employees	26	\$ 1,077,600	22	\$ 915,691	41.9	2.3	2.3
Vested Former Employees	4	3,457	2	1,942	33.4	1.8	3.3
Retirees and Beneficiaries	1	5,071	0	0	63.4		
Total Municipality							
Active Employees	345	\$ 19,275,745	340	\$ 18,317,097	46.0	9.8	10.5
Vested Former Employees	48	681,417	48	705,962	50.1	10.4	14.1
Retirees and Beneficiaries	425	10,724,962	412	10,166,224	69.4		
Total Participants	818		800				

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

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

Table 4: Reported Assets (Market Value)

Division	2018 Valuation		2017 Valuation	
	Employer and Retiree ¹	Employee ²	Employer and Retiree ¹	Employee ²
01 - Gnrl NonUn.	\$ 15,104,977	\$ 1,666,287	\$ 16,557,381	\$ 1,418,546
10 - General AFSCME	20,663,710	1,051,874	23,524,416	1,225,426
11 - Gnrl Transit	4,513,235	176,471	5,042,750	230,181
12 - Gnrl BCSA	8,773,473	876,860	9,466,635	754,748
13 - Gnrl Housing	4,218,202	134,953	4,539,643	123,156
14 - SEIU Local	16,123,667	824,272	18,399,329	916,676
15 - City Mngr.	975,383	7,803	825,805	7,603
16 - Cntrl Disp.	1,260,737	14,046	1,420,127	14,727
17 - Corr.Offrcs	700,552	48,851	764,265	43,573
18 - General AFSCME after 12/1/10	777,766	348,645	670,886	264,578
19 - Gen. SEIU hired after 7/1/2011	453,981	245,468	397,146	195,536
20 - Gen. BCSA hired after 1/1/2012	85,604	36,360	74,174	26,079
HA - GNL Trans hired after 3/1/10	311,681	0	256,130	0
S1 - Surplus Unassociated	379,870	0	291,141	0
Municipality Total³	\$ 74,342,838	\$ 5,431,891	\$ 82,229,828	\$ 5,220,829
Combined Assets³	\$79,774,729		\$87,450,657	

¹ Reserve for Employer Contributions and Benefit Payments.

² Reserve for Employee Contributions.

³ Totals may not add due to rounding.

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

Assets in the Surplus division(s) are employer assets that have been reserved to be used by the employer at some point in the future to stabilize increases in contributions. These assets are not used in calculating the employer contribution for the fiscal year beginning July 1, 2020.

Table 5: Flow of Valuation Assets

Year Ended 12/31	Employer Contributions		Employee Contributions	Investment Income (Valuation Assets)	Benefit Payments	Employee Contribution Refunds	Net Transfers	Valuation Asset Balance
	Required	Additional						
2008	\$ 2,968,152		\$ 551,782	\$ 3,716,560	\$ (5,114,794)	\$ (48,257)	\$ 0	\$ 85,758,953
2009	2,959,132		552,800	3,637,611	(5,698,007)	(39,591)	0	87,170,898
2010	2,868,331		453,617	4,281,248	(6,516,632)	(59,121)	49,333	88,247,674
2011	4,106,953	\$ 0	420,760	3,474,621	(7,369,893)	(49,719)	(2,802,205)	86,028,191
2012	3,425,331	133,259	396,893	3,504,637	(8,079,082)	(11,672)	26,998	85,424,555
2013	3,646,578	1,904,258	398,173	5,034,108	(8,415,175)	(38,371)	1	87,954,127
2014	3,776,984	0	419,888	4,832,408	(8,762,592)	(13,880)	198,983	88,405,918
2015	4,004,442	99,850	443,676	4,113,925	(9,048,762)	(56,391)	52,309	88,014,967
2016	4,353,308	16,169	487,265	4,189,261	(9,572,000)	(8,787)	39,636	87,519,819
2017	5,035,846	346,606	546,536	5,040,598	(9,983,596)	(65,125)	2	88,440,686
2018	5,404,480	194,470	635,312	3,151,829	(10,495,785)	(16,549)	66,168	87,380,611

Notes:

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

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

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

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

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

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

Division	Actuarial Accrued Liability						Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
	Active Employees	Vested Former Employees	Retirees and Beneficiaries	Pending Refunds	Total				
01 - Gnl NonUn.	\$ 12,194,300	\$ 1,697,338	\$ 23,054,933	\$ 34,636	\$ 36,981,207	\$ 18,370,270	49.7%	\$ 18,610,937	
10 - General AFSCME	9,033,603	601,179	26,059,391	28,923	35,723,096	23,785,991	66.6%	11,937,105	
11 - Gnl Transit	1,562,317	181,917	6,146,263	10,639	7,901,136	5,136,832	65.0%	2,764,304	
12 - Gnl BCSA	8,100,992	544,861	16,571,200	0	25,217,053	10,570,414	41.9%	14,646,639	
13 - Gnl Housing	2,942,069	223,099	2,572,034	999	5,738,201	4,768,193	83.1%	970,008	
14 - SEIU Local	6,253,271	697,984	21,811,849	38,243	28,801,347	18,563,790	64.5%	10,237,557	
15 - City Mngr.	431,401	0	5,334,591	0	5,765,992	1,076,925	18.7%	4,689,067	
16 - Cntrl Disp.	0	405,173	1,307,658	3,722	1,716,553	1,396,324	81.3%	320,229	
17 - Corr. Offrcs	99,256	72,845	430,295	3,462	605,858	820,853	135.5%	(214,995)	
18 - General AFSCME after 12/1/10	1,262,906	0	26,413	45,250	1,334,569	1,233,806	92.4%	100,763	
19 - Gen. SEIU hired after 7/1/2011	825,692	15,284	0	8,854	849,830	766,136	90.2%	83,694	
20 - Gen. BCSA hired after 1/1/2012	113,966	0	0	12,531	126,497	133,592	105.6%	(7,095)	
HA - GNL Trans hired after 3/1/10	234,469	13,149	51,437	0	299,055	341,397	114.2%	(42,342)	
S1 - Surplus Unassociated	0	0	0	0	0	416,088		(416,088)	
Total	\$ 43,054,242	\$ 4,452,829	\$103,366,064	\$ 187,259	\$ 151,060,394	\$ 87,380,611	57.8%	\$ 63,679,783	

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 18, 10	\$ 10,296,509	\$ 601,179	\$26,085,804	\$ 74,173	\$ 37,057,665	\$ 25,019,797	67.5%	\$ 12,037,868	
Linked Divisions 19, 14	7,078,963	713,268	21,811,849	47,097	29,651,177	19,329,926	65.2%	10,321,251	
Linked Divisions 20, 12	8,214,958	544,861	16,571,200	12,531	25,343,550	10,704,006	42.2%	14,639,544	
Linked Divisions HA, 11	1,796,786	195,066	6,197,700	10,639	8,200,191	5,478,229	66.8%	2,721,962	

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

Table 7: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2004	\$ 92,602,174	\$ 69,677,870	75%	\$ 22,924,304
2005	98,161,300	73,555,512	75%	24,605,788
2006	103,019,360	78,530,625	76%	24,488,735
2007	108,343,302	83,685,510	77%	24,657,792
2008	114,485,126	85,758,953	75%	28,726,173
2009	117,667,634	87,170,898	74%	30,496,736
2010	121,967,784	88,247,674	72%	33,720,110
2011	125,554,938	86,028,191	69%	39,526,747
2012	125,080,017	85,424,555	68%	39,655,462
2013	128,362,120	87,954,127	69%	40,407,993
2014	132,642,371	88,405,918	67%	44,236,453
2015	142,257,026	88,014,967	62%	54,242,059
2016	144,605,126	87,519,819	61%	57,085,307
2017	147,753,489	88,440,686	60%	59,312,803
2018	151,060,394	87,380,611	58%	63,679,783

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

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

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

Tables 8 and 9: Division-Based Comparative Schedules

Division 01 - Gnrl NonUn.

Table 8-01: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 26,704,641	\$ 19,486,827	73%	\$ 7,217,814
2009	27,086,420	18,980,302	70%	8,106,118
2010	28,139,605	18,498,320	66%	9,641,285
2011	28,719,364	17,717,784	62%	11,001,580
2012	28,445,176	17,201,716	61%	11,243,460
2013	28,920,190	17,110,935	59%	11,809,255
2014	30,180,098	17,320,168	57%	12,859,930
2015	33,548,161	17,578,580	52%	15,969,581
2016	34,669,914	17,918,013	52%	16,751,901
2017	35,807,575	18,179,432	51%	17,628,143
2018	36,981,207	18,370,270	50%	18,610,937

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

Table 9-01: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	50	\$ 3,475,062	20.49%	2.00%
2009	52	3,688,557	21.40%	2.00%
2010	48	3,321,913	25.71%	2.00%
2011	47	3,325,529	28.91%	2.00%
2012	49	3,513,560	29.29%	2.00%
2013	50	3,505,149	30.35%	2.00%
2014	52	3,749,622	30.62%	2.00%
2015	56	3,938,414	35.64%	3.00%
2016	60	4,381,947	34.68%	3.00%
2017	62	4,569,675	34.66%	4.00%
2018	63	4,857,655	34.32%	5.00%

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

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

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

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

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

Division 10 - General AFSCME

Table 8-10: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 30,476,499	\$ 24,602,751	81%	\$ 5,873,748
2009	30,931,179	25,382,663	82%	5,548,516
2010	31,695,838	26,016,328	82%	5,679,510
2011	32,153,521	25,978,676	81%	6,174,845
2012	32,140,644	26,043,511	81%	6,097,133
2013	32,923,896	26,215,800	80%	6,708,096
2014	33,785,664	26,306,791	78%	7,478,873
2015	36,066,837	26,079,521	72%	9,987,316
2016	36,467,677	25,501,801	70%	10,965,876
2017	36,188,384	25,030,035	69%	11,158,349
2018	35,723,096	23,785,991	67%	11,937,105

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

Table 9-10: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	136	\$ 6,040,939	14.00%	2.50%
2009	129	5,841,342	14.15%	2.50%
2010	113	4,907,939	15.70%	2.50%
2011	96	4,447,277	\$ 60,959	2.50%
2012	91	3,935,769	\$ 57,221	2.50%
2013	78	3,433,686	\$ 58,710	2.50%
2014	74	3,506,111	\$ 65,035	2.50%
2015	64	3,048,947	\$ 81,776	2.50%
2016	59	2,871,821	\$ 86,243	2.75%
2017	52	2,534,173	\$ 85,715	2.75%
2018	43	2,310,685	\$ 91,171	2.75%

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

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

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

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

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

Division 11 - Gnl Transit

Table 8-11: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 6,044,798	\$ 4,831,082	80%	\$ 1,213,716
2009	6,164,769	4,961,344	80%	1,203,425
2010	6,398,996	5,089,138	80%	1,309,858
2011	6,792,528	5,220,156	77%	1,572,372
2012	7,046,884	5,309,103	75%	1,737,781
2013	7,368,535	5,405,653	73%	1,962,882
2014	7,425,844	5,507,426	74%	1,918,418
2015	7,900,780	5,491,536	70%	2,409,244
2016	8,074,463	5,438,120	67%	2,636,343
2017	8,027,992	5,332,626	66%	2,695,366
2018	7,901,136	5,136,832	65%	2,764,304

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

Table 9-11: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	32	\$ 1,264,369	14.44%	2.50%
2009	35	1,389,512	13.93%	2.50%
2010	31	1,245,573	\$ 14,966	2.50%
2011	30	1,248,167	\$ 17,132	2.50%
2012	29	1,247,665	\$ 18,161	2.50%
2013	24	1,067,838	\$ 18,189	2.50%
2014	21	922,129	\$ 16,948	2.50%
2015	19	818,690	\$ 20,243	2.50%
2016	14	654,579	\$ 20,305	2.50%
2017	11	568,014	\$ 20,135	2.50%
2018	8	388,202	\$ 19,739	2.50%

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

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

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

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

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

Division 12 - Gnrl BCSA

Table 8-12: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 16,233,895	\$ 10,727,912	66%	\$ 5,505,983
2009	16,834,204	10,890,369	65%	5,943,835
2010	18,287,546	11,222,688	61%	7,064,858
2011	19,498,544	10,596,421	54%	8,902,123
2012	19,174,093	10,216,513	53%	8,957,580
2013	19,738,162	10,086,955	51%	9,651,207
2014	20,213,419	9,992,873	49%	10,220,546
2015	21,020,916	9,873,654	47%	11,147,262
2016	22,131,768	10,062,324	46%	12,069,444
2017	23,122,708	10,337,099	45%	12,785,609
2018	25,217,053	10,570,414	42%	14,646,639

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

Table 9-12: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	31	\$ 1,951,546	22.41%	4.16%
2009	31	2,054,806	23.27%	4.16%
2010	22	1,319,575	37.41%	4.16%
2011	24	1,546,987	\$ 55,466	4.16%
2012	23	1,434,721	\$ 54,268	4.16%
2013	23	1,461,271	\$ 59,354	4.16%
2014	22	1,442,714	\$ 63,841	4.16%
2015	21	1,369,555	\$ 72,746	4.16%
2016	22	1,464,338	\$ 78,955	5.16%
2017	22	1,636,242	\$ 86,042	5.16%
2018	22	1,739,995	\$ 101,346	5.16%

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

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

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

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

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

Division 13 - Gnl Housing

Table 8-13: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 3,245,000	\$ 1,651,560	51%	\$ 1,593,440
2009	3,333,272	1,746,352	52%	1,586,920
2010	3,669,970	1,818,280	50%	1,851,690
2011	3,955,186	1,884,314	48%	2,070,872
2012	4,075,358	2,111,297	52%	1,964,061
2013	4,339,820	4,379,313	101%	(39,493)
2014	4,645,898	4,456,553	96%	189,345
2015	5,178,067	4,502,532	87%	675,535
2016	5,325,263	4,570,819	86%	754,444
2017	5,511,549	4,715,587	86%	795,962
2018	5,738,201	4,768,193	83%	970,008

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

Table 9-13: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	12	\$ 505,626	28.33%	1.50%
2009	11	530,871	27.71%	1.50%
2010	13	602,973	28.82%	1.50%
2011	13	615,755	31.57%	1.50%
2012	12	647,094	31.37%	1.50%
2013	13	703,972	9.60%	1.50%
2014	11	650,340	\$ 8,211	1.50%
2015	11	671,847	\$ 12,544	1.50%
2016	10	613,062	\$ 11,874	1.50%
2017	9	581,402	\$ 11,927	1.50%
2018	9	570,602	\$ 13,308	1.50%

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

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

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

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

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

Division 14 - SEIU Local

Table 8-14: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 22,773,684	\$ 19,201,960	84%	\$ 3,571,724
2009	23,973,170	19,842,162	83%	4,131,008
2010	24,778,206	20,308,324	82%	4,469,882
2011	26,591,360	20,734,278	78%	5,857,082
2012	26,669,481	20,637,251	77%	6,032,230
2013	27,111,309	20,750,141	77%	6,361,168
2014	27,956,726	20,831,443	75%	7,125,283
2015	29,572,682	20,382,825	69%	9,189,857
2016	28,733,313	19,754,399	69%	8,978,914
2017	29,123,358	19,534,681	67%	9,588,677
2018	28,801,347	18,563,790	64%	10,237,557

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

Table 9-14: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	114	\$ 4,800,746	12.93%	2.50%
2009	109	4,771,596	13.90%	2.50%
2010	100	4,298,849	15.31%	2.50%
2011	84	3,642,189	\$ 57,214	2.50%
2012	78	3,448,701	\$ 55,641	2.50%
2013	70	3,170,776	\$ 56,299	2.50%
2014	67	3,128,958	\$ 61,491	2.50%
2015	60	2,876,019	\$ 75,943	2.50%
2016	47	2,255,302	\$ 68,730	3.00%
2017	41	2,046,849	\$ 72,286	3.00%
2018	34	1,735,412	\$ 75,459	3.50%

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

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

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

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

Division 15 - City Mngr.

Table 8-15: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 5,277,094	\$ 2,092,857	40%	\$ 3,184,237
2009	5,424,741	1,854,233	34%	3,570,508
2010	5,464,593	1,697,637	31%	3,766,956
2011	5,508,689	1,582,539	29%	3,926,150
2012	5,510,200	1,459,650	27%	4,050,550
2013	5,659,625	1,321,703	23%	4,337,922
2014	5,766,202	1,011,334	18%	4,754,868
2015	5,778,113	800,626	14%	4,977,487
2016	5,768,822	633,488	11%	5,135,334
2017	5,761,769	842,843	15%	4,918,926
2018	5,765,992	1,076,925	19%	4,689,067

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

Table 9-15: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	2	\$ 206,689	94.60%	0.00%
2009	2	247,814	87.42%	0.00%
2010	2	242,478	93.59%	0.00%
2011	2	247,780	97.84%	0.00%
2012	2	256,419	106.72%	0.00%
2013	2	239,173	121.87%	0.00%
2014	2	231,433	138.91%	0.00%
2015	2	250,936	375.83%	0.00%
2016	2	261,147	152.10%	0.00%
2017	2	267,898	143.67%	0.00%
2018	2	273,550	201.41%	0.00%

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

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

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

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

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

Division 16 - Cntrl Disp.

Table 8-16: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 3,372,668	\$ 2,527,237	75%	\$ 845,431
2009	3,521,563	2,838,167	81%	683,396
2010	3,050,392	2,883,558	95%	166,834
2011	1,801,204	1,546,437	86%	254,767
2012	1,436,711	1,541,444	107%	(104,733)
2013	1,472,927	1,538,184	104%	(65,257)
2014	1,500,422	1,531,662	102%	(31,240)
2015	1,626,639	1,500,876	92%	125,763
2016	1,535,118	1,468,956	96%	66,162
2017	1,695,002	1,451,098	86%	243,904
2018	1,716,553	1,396,324	81%	320,229

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

Table 9-16: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	19	\$ 922,526	11.81%	7.20%
2009	20	988,564	11.06%	7.20%
2010	0	0	\$ 67	0.00%
2011	0	0	\$ 1,156	0.00%
2012	0	0	\$ 0	0.00%
2013	0	0	\$ 0	0.00%
2014	0	0	\$ 0	0.00%
2015	0	0	\$ 995	0.00%
2016	0	0	\$ 482	7.20%
2017	0	0	\$ 2,292	7.20%
2018	0	0	\$ 3,327	7.20%

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

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

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

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

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

Table 8-17: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 356,847	\$ 636,767	178%	\$ (279,920)
2009	398,316	675,306	170%	(276,990)
2010	481,556	711,082	148%	(229,526)
2011	490,940	717,874	146%	(226,934)
2012	435,200	722,728	166%	(287,528)
2013	447,884	737,311	165%	(289,427)
2014	462,403	752,232	163%	(289,829)
2015	484,089	761,040	157%	(276,951)
2016	502,874	773,471	154%	(270,597)
2017	564,276	816,984	145%	(252,708)
2018	605,858	820,853	135%	(214,995)

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

Table 9-17: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	2	\$ 104,889	0.00%	3.12%
2009	2	115,295	0.00%	3.12%
2010	1	61,084	0.00%	3.12%
2011	1	56,073	0.00%	3.12%
2012	0	0	\$ 0	0.00%
2013	1	59,571	0.00%	3.12%
2014	1	58,695	0.00%	3.12%
2015	1	55,018	0.00%	3.12%
2016	1	70,915	0.00%	3.12%
2017	2	118,639	0.00%	3.12%
2018	2	132,460	0.00%	3.12%

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

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

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

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

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

Division 18 - General AFSCME after 12/1/10

Table 8-18: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
2010	0	0	0%	0
2011	30,809	38,693	126%	(7,884)
2012	97,827	114,705	117%	(16,878)
2013	224,963	232,289	103%	(7,326)
2014	378,614	363,551	96%	15,063
2015	547,342	532,171	97%	15,171
2016	651,476	670,887	103%	(19,411)
2017	964,264	946,054	98%	18,210
2018	1,334,569	1,233,806	92%	100,763

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

Table 9-18: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
2010	0	0	\$ 0	0.00%
2011	16	631,087	4.67%	2.50%
2012	26	996,013	4.46%	2.50%
2013	34	1,365,798	4.67%	2.50%
2014	36	1,611,962	4.92%	2.50%
2015	49	2,110,015	5.29%	2.50%
2016	56	2,351,415	5.36%	2.50%
2017	64	2,873,816	5.26%	2.50%
2018	74	3,452,289	5.29%	2.50%

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

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

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

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

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

Division 19 - Gen. SEIU hired after 7/1/2011

Table 8-19: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
2010	0	0	0%	0
2011	1,988	0	0%	1,988
2012	26,191	39,491	151%	(13,300)
2013	85,341	103,141	121%	(17,800)
2014	196,839	204,319	104%	(7,480)
2015	337,562	319,482	95%	18,080
2016	480,731	460,534	96%	20,197
2017	646,414	599,392	93%	47,022
2018	849,830	766,136	90%	83,694

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

Table 9-19: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
2010	0	0	\$ 0	0.00%
2011	5	138,822	5.09%	2.50%
2012	16	510,841	4.86%	2.50%
2013	28	928,192	4.59%	2.50%
2014	35	1,269,348	4.78%	2.50%
2015	35	1,339,053	5.01%	2.50%
2016	43	1,680,900	4.64%	3.00%
2017	50	1,987,507	4.73%	3.00%
2018	57	2,415,318	4.30%	3.50%

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

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

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

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

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

Division 20 - Gen. BCSA hired after 1/1/2012

Table 8-20: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
2010	0	0	0%	0
2011	0	0	0%	0
2012	0	0	0%	0
2013	14,554	17,078	117%	(2,524)
2014	38,187	38,604	101%	(417)
2015	62,944	57,950	92%	4,994
2016	87,530	78,575	90%	8,955
2017	114,802	101,388	88%	13,414
2018	126,497	133,592	106%	(7,095)

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

Table 9-20: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
2010	0	0	\$ 0	0.00%
2011	0	0	\$ 0	0.00%
2012	0	0	\$ 0	0.00%
2013	1	65,925	4.33%	2.50%
2014	3	166,152	5.18%	2.50%
2015	3	204,667	5.44%	2.50%
2016	3	212,173	5.45%	2.50%
2017	3	217,191	5.50%	2.50%
2018	5	321,977	6.51%	2.50%

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

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

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

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

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

Division HA - GNL Trans hired after 3/1/10

Table 8-HA: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0	0%	\$ 0
2009	0	0	0%	0
2010	1,082	2,319	214%	(1,237)
2011	10,805	11,019	102%	(214)
2012	22,252	27,146	122%	(4,894)
2013	54,914	55,624	101%	(710)
2014	92,055	88,962	97%	3,093
2015	132,894	134,174	101%	(1,280)
2016	176,177	188,432	107%	(12,255)
2017	225,396	259,030	115%	(33,634)
2018	299,055	341,397	114%	(42,342)

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

Table 9-HA: Computed Employer Contributions - Comparative Schedule

Valuation Date December 31	Active Employees		Computed Employer Contribution ¹	Employee Contribution Rate ²
	Number	Annual Payroll		
2008	0	\$ 0	\$ 0	0.00%
2009	0	0	\$ 0	0.00%
2010	2	67,555	6.26%	0.00%
2011	3	125,196	6.89%	0.00%
2012	7	266,832	7.08%	0.00%
2013	9	370,383	6.77%	0.00%
2014	12	463,172	6.38%	0.00%
2015	14	566,021	6.93%	0.00%
2016	15	635,176	6.37%	0.00%
2017	22	915,691	6.56%	0.00%
2018	26	1,077,600	6.29%	0.00%

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

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

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

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

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

Division S1 - Surplus Unassociated

Table 8-S1: Actuarial Accrued Liabilities - Comparative Schedule

Valuation Date December 31	Actuarial Accrued Liability	Valuation Assets	Percent Funded	Unfunded (Overfunded) Accrued Liabilities
2008	\$ 0	\$ 0		\$ 0
2009	0	0		0
2010	0	0		0
2011	0	0		0
2012	0	0		0
2013	0	0		0
2014	0	0		0
2015	0	0		0
2016	0	0		0
2017	0	294,437		(294,437)
2018	0	416,088		(416,088)

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

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

Table 10: Division-Based Layered Amortization Schedule

Division 01 - Gnrl NonUn.

Table 10-01: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 15,969,581	23	\$ 16,873,416	20	\$ 1,224,828
(Gain)/Loss	12/31/2016	375,584	22	424,810	20	30,840
(Gain)/Loss	12/31/2017	639,742	21	718,772	20	52,176
Amendment	12/31/2017	(16,827)	21	(18,909)	20	(1,368)
(Gain)/Loss	12/31/2018	789,675	20	883,231	20	64,116
Amendment	12/31/2018	(11,551)	20	(12,919)	20	(936)
Total				\$ 18,868,401		\$ 1,369,656

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

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

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

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

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

Division 10 - General AFSCME

Table 10-10: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 9,987,316	23	\$ 10,673,871	20	\$ 774,804
(Gain)/Loss	12/31/2016	653,157	22	738,759	20	53,628
Amendment	12/31/2016	(3,650)	22	(4,132)	20	(300)
(Gain)/Loss	12/31/2017	(42,807)	21	(48,100)	20	(3,492)
(Gain)/Loss	12/31/2018	664,814	20	743,577	20	53,976
Total				\$ 12,103,975		\$ 878,616

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

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

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

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

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

Division 11 - Gnl Transit

Table 10-11: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 2,409,244	23	\$ 2,550,645	20	\$ 185,148
(Gain)/Loss	12/31/2016	162,926	22	184,280	20	13,380
(Gain)/Loss	12/31/2017	10,426	21	11,718	20	852
(Gain)/Loss	12/31/2018	39,748	20	44,457	20	3,228
Total				\$ 2,791,100		\$ 202,608

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

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

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

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

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

Division 12 - Gnrl BCSA

Table 10-12: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 11,147,262	23	\$ 11,714,282	20	\$ 850,332
(Gain)/Loss	12/31/2016	695,820	22	787,008	20	57,132
Amendment	12/31/2016	1,542	22	1,744	20	132
(Gain)/Loss	12/31/2017	509,676	21	572,637	20	41,568
(Gain)/Loss	12/31/2018	1,693,160	20	1,893,756	20	137,472
Total				\$ 14,969,427		\$ 1,086,636

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

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

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

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

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

Division 13 - Gnl Housing

Table 10-13: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 675,535	20	\$ 761,894	15	\$ 67,788
(Gain)/Loss	12/31/2016	6,402	18	7,059	15	624
(Gain)/Loss	12/31/2017	17,679	16	19,562	15	1,740
(Gain)/Loss	12/31/2018	172,396	15	192,820	15	17,160
Total				\$ 981,335		\$ 87,312

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

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

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

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

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

Table 10-14: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 9,189,857	23	\$ 9,811,306	20	\$ 712,200
(Gain)/Loss	12/31/2016	(537,210)	22	(607,608)	20	(44,112)
Amendment	12/31/2016	5,043	22	5,707	20	420
(Gain)/Loss	12/31/2017	508,934	21	571,805	20	41,508
(Gain)/Loss	12/31/2018	556,118	20	622,004	20	45,156
Amendment	12/31/2018	(3,597)	20	(4,023)	20	(288)
Total				\$ 10,399,191		\$ 754,884

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

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

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

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

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

Division 15 - City Mngr.

Table 10-15: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 4,977,487	23	\$ 4,366,862	20	\$ 533,964
(Gain)/Loss	12/31/2016	77,986	22	88,206	20	6,408
(Gain)/Loss	12/31/2017	63,871	21	71,766	20	5,208
(Gain)/Loss	12/31/2018	105,525	20	118,027	20	8,568
Total				\$ 4,644,861		\$ 554,148

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

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

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

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

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

Division 16 - Cntrl Disp.

Table 10-16: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 125,763	16	\$ 132,126	10	\$ 16,164
(Gain)/Loss	12/31/2016	(69,400)	14	(73,649)	10	(9,012)
(Gain)/Loss	12/31/2017	178,820	12	193,577	10	23,676
(Gain)/Loss	12/31/2018	66,509	10	74,389	10	9,096
Total				\$ 326,443		\$ 39,924

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

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

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

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

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

Table 10-17: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ (276,951)	10	\$ (290,524)	10	\$ (35,532)
(Gain)/Loss	12/31/2016	23,820	15	25,719	13	2,556
(Gain)/Loss	12/31/2017	33,527	15	36,942	14	3,456
(Gain)/Loss	12/31/2018	36,193	15	40,481	15	3,600
Total				\$ (187,382)		\$ (25,920)

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

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

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

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

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

Division 18 - General AFSCME after 12/1/10

Table 10-18: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
(Gain)/Loss	12/31/2017	\$ 18,637	15	\$ 20,529	14	\$ 1,920
(Gain)/Loss	12/31/2018	81,419	15	91,065	15	8,100
Total				\$ 111,594		\$ 10,020

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

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

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

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

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

Division 19 - Gen. SEIU hired after 7/1/2011

Table 10-19: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
Initial	12/31/2015	\$ 18,080	23	\$ 26,338	20	\$ 1,908
(Gain)/Loss	12/31/2016	(875)	22	(981)	20	(72)
Amendment	12/31/2016	(5,553)	22	(6,280)	20	(456)
(Gain)/Loss	12/31/2017	28,079	21	31,547	20	2,292
(Gain)/Loss	12/31/2018	44,223	20	49,462	20	3,588
Amendment	12/31/2018	(9,705)	20	(10,855)	20	(792)
Total				\$ 89,231		\$ 6,468

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

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

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

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

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

Division 20 - Gen. BCSA hired after 1/1/2012

Table 10-20: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
(Gain)/Loss	12/31/2018	\$ (8,349)	15	\$ (9,338)	15	\$ (828)
Total				\$ (9,338)		\$ (828)

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

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

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

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

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

Division HA - GNL Trans hired after 3/1/10

Table 10-HA: Layered Amortization Schedule

Type of UAL	Date Established	Original Balance ¹	Original Amortization Period ²	Amounts for Fiscal Year Beginning 7/1/2020		
				Outstanding UAL Balance ³	Remaining Amortization Period ²	Annual Amortization Payment
(Gain)/Loss	12/31/2016	\$ (11,961)	15	\$ (12,919)	13	\$ (1,284)
(Gain)/Loss	12/31/2017	(20,846)	15	(22,968)	14	(2,148)
(Gain)/Loss	12/31/2018	(6,599)	15	(7,381)	15	(660)
Total				\$ (43,268)		\$ (4,092)

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

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

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

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

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

GASB 68 Information

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

Actuarial Valuation Date:	12/31/2018
Measurement Date of the Total Pension Liability (TPL):	12/31/2018
At 12/31/2018, the following employees were covered by the benefit terms:	
Inactive employees or beneficiaries currently receiving benefits:	425
Inactive employees entitled to but not yet receiving benefits (including refunds):	137
Active employees:	<u>345</u>
	907
Total Pension Liability as of 12/31/2017 measurement date:	\$ 144,360,278
Total Pension Liability as of 12/31/2018 measurement date:	\$ 147,621,824
Service Cost for the year ending on the 12/31/2018 measurement date:	\$ 2,056,135
Change in the Total Pension Liability due to:	
- Benefit changes ¹ :	\$ (25,969)
- Differences between expected and actual experience ² :	\$ 533,141
- Changes in assumptions ² :	\$ 0

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

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

Average expected remaining service lives of all employees (active and inactive):	4
Covered employee payroll: (Needed for Required Supplementary Information)	\$ 19,275,745

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

	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Change in Net Pension Liability as of 12/31/2018:	\$ 14,595,857	\$ -	\$ (12,523,508)

Note: The current discount rate shown for GASB 68 purposes is higher than the MERS assumed rate of return. This is because for GASB 68 purposes, the discount rate must be gross of administrative expenses, whereas for funding purposes it is net of administrative expenses.

Benefit Provision History

The following benefit provision history is provided by MERS. Any corrections to this history or discrepancies between this information and information displayed elsewhere in the valuation report should be reported to MERS. All provisions are listed by date of adoption.

01 - Gnrl NonUn.

7/1/2018	Participant Contribution Rate 5%
7/1/2017	Participant Contribution Rate 4%
12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2015	Participant Contribution Rate 3%
4/1/2010	Non Standard Compensation Definition
7/1/2000	Temporary Benefit F55 (With 20 Years of Service) (07/01/2000 - 09/03/2000)
1/1/1996	Benefit B-4 (80% max)
1/1/1996	Member Contribution Rate 2.00%
7/1/1994	Member Contribution Rate 1.50%
6/1/1993	Temporary Benefit RS 50 (50% Post-Ret. Spouse Benefits) (06/01/1993 - 08/03/1993)
6/1/1993	Benefit FAC-3 (3 Year Final Average Compensation)
6/1/1993	Benefit B-3 (80% max)
1/1/1989	Flexible E 2% COLA Adopted (01/01/1989)
3/1/1987	Benefit F55 (With 25 Years of Service)
3/1/1987	Member Contribution Rate 0.00%
2/1/1986	Benefit C-2/Base B-1
5/6/1975	Exclude Temporary Employees
8/1/1973	Benefit C-1 (Old)
7/10/1973	Covered by Act 88
7/1/1962	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/1962	10 Year Vesting
7/1/1962	Benefit C (Old)
7/1/1962	Member Contribution Rate 3.00% Under \$4,200.00 - Then 5.00%
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

10 - General AFSCME

12/1/2016	Service Credit Purchase Estimates - Yes
9/1/2016	Participant Contribution Rate 2.75%
1/1/2011	Non Standard Compensation Definition
10/1/1995	Member Contribution Rate 2.50%
6/1/1995	Benefit B-4 (80% max)
6/1/1995	Member Contribution Rate 2.00%
1/1/1994	Benefit FAC-3 (3 Year Final Average Compensation)
1/1/1994	Benefit B-3 (80% max)
1/1/1994	Member Contribution Rate 1.50%
1/1/1988	Flexible E 2% COLA Adopted (01/01/1988)
2/1/1986	Benefit FAC-5 (5 Year Final Average Compensation)
2/1/1986	10 Year Vesting
2/1/1986	Benefit C-2/Base B-1
2/1/1986	Benefit F55 (With 25 Years of Service)

10 - General AFSCME

2/1/1986 Member Contribution Rate 0.00%
7/10/1973 Covered by Act 88
7/1/1962 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 - Gnl Transit

12/1/2016 Service Credit Purchase Estimates - Yes
11/1/2009 Non Standard Compensation Definition
12/1/2001 Temporary 8 Year Vesting (12/01/2001 - 02/03/2002)
11/1/2000 Member Contribution Rate 2.50%
10/1/1998 Member Contribution Rate 1.75%
9/1/1998 Benefit B-4 (80% max)
1/1/1997 Benefit FAC-3 (3 Year Final Average Compensation)
1/1/1997 Benefit B-3 (80% max)
1/1/1997 Member Contribution Rate 1.50%
1/1/1988 Flexible E 2% COLA Adopted (01/01/1988)
11/1/1986 Benefit C-2/Base B-1
4/1/1986 Benefit FAC-5 (5 Year Final Average Compensation)
4/1/1986 10 Year Vesting
4/1/1986 Benefit F55 (With 25 Years of Service)
4/1/1986 Member Contribution Rate 0.00%
7/10/1973 Covered by Act 88
7/1/1962 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 - Gnrl BCSA

12/1/2016 Service Credit Purchase Estimates - Yes
9/1/2016 Participant Contribution Rate 5.16%
6/1/2010 Non Standard Compensation Definition
5/1/2003 Benefit RS 50 (50% Post-Ret. Spouse Benefits)
5/1/2003 Member Contribution Rate 4.16%
7/1/1996 Member Contribution Rate 2.50%
1/1/1996 Benefit FAC-3 (3 Year Final Average Compensation)
1/1/1996 Benefit B-4 (80% max)
1/1/1996 Member Contribution Rate 2.00%
1/1/1994 Benefit B-3 (80% max)
1/1/1994 Member Contribution Rate 1.50%
1/1/1989 Flexible E 2% COLA Adopted (01/01/1989)
6/1/1987 Benefit F55 (With 25 Years of Service)
6/1/1986 Benefit FAC-5 (5 Year Final Average Compensation)
6/1/1986 10 Year Vesting
6/1/1986 Benefit C-2/Base B-1
5/11/1986 Member Contribution Rate 0.00%
7/10/1973 Covered by Act 88
7/1/1962 Fiscal Month - July
Defined Benefit Normal Retirement Age - 60
Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

13 - Gnl Housing

12/1/2016	Service Credit Purchase Estimates - Yes
12/1/2013	Option B Yes
12/1/2013	Accelerated to 15-year Amortization
12/1/2013	DC Adoption Date 12-01-2013
8/1/2005	Temporary 24 Years & Out (08/01/2005 - 10/03/2005)
5/1/2000	E2 2.5% COLA for future retirees (05/01/2000)
10/1/1998	Benefit B-4 (80% max)
7/1/1994	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/1994	Benefit B-3 (80% max)
7/1/1994	Member Contribution Rate 1.50%
1/1/1988	Flexible E 2% COLA Adopted (01/01/1988)
1/1/1987	Flexible E 2% COLA Adopted (01/01/1987)
12/1/1986	Benefit F55 (With 25 Years of Service)
5/1/1986	Benefit FAC-5 (5 Year Final Average Compensation)
5/1/1986	10 Year Vesting
5/1/1986	Benefit C-2/Base B-1
5/1/1986	Member Contribution Rate 0.00%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

14 - SEIU Local

7/1/2018	Participant Contribution Rate 3.5%
12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2016	Participant Contribution Rate 3%
1/1/2012	Non Standard Compensation Definition
1/1/1997	Member Contribution Rate 2.50%
1/1/1996	Benefit B-4 (80% max)
1/1/1996	Member Contribution Rate 2.00%
1/1/1994	Benefit FAC-3 (3 Year Final Average Compensation)
1/1/1994	Benefit B-3 (80% max)
1/1/1994	Member Contribution Rate 1.50%
1/1/1989	Flexible E 2% COLA Adopted (01/01/1989)
9/1/1987	Benefit F55 (With 25 Years of Service)
11/1/1986	Benefit C-2/Base B-1
10/17/1986	Benefit FAC-5 (5 Year Final Average Compensation)
10/17/1986	10 Year Vesting
10/17/1986	Member Contribution Rate 0.00%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

15 - City Mngr.

12/1/2016	Service Credit Purchase Estimates - Yes
7/1/1996	Benefit RS 50 (50% Post-Ret. Spouse Benefits)
7/1/1996	Benefit B-4 (80% max)
7/1/1996	Benefit F50 (With 25 Years of Service)

15 - City Mngr.

5/1/1993	Benefit FAC-3 (3 Year Final Average Compensation)
5/1/1993	10 Year Vesting
5/1/1993	Benefit B-3 (80% max)
5/1/1993	Benefit F55 (With 15 Years of Service)
5/1/1993	Member Contribution Rate 0.00%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

16 - Cntrl Disp.

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2004	Member Contribution Rate 7.20%
1/1/2004	E2 2.5% COLA for future retirees (01/01/2004)
1/1/2003	Member Contribution Rate 2.50%
1/1/2002	Member Contribution Rate 1.75%
1/1/2001	Benefit FAC-3 (3 Year Final Average Compensation)
1/1/2001	Benefit B-4 (80% max)
1/1/2001	Member Contribution Rate 1.00%
1/1/1994	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1994	10 Year Vesting
1/1/1994	Benefit C-2/Base B-1
1/1/1994	Benefit F55 (With 25 Years of Service)
1/1/1994	Member Contribution Rate 0.00%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

17 - Corr.Offrcs

12/1/2016	Service Credit Purchase Estimates - Yes
3/1/2001	Benefit B-3 (80% max)
3/1/2001	Member Contribution Rate 3.12%
1/1/1994	Benefit FAC-5 (5 Year Final Average Compensation)
1/1/1994	10 Year Vesting
1/1/1994	Benefit C-2/Base B-1
1/1/1994	Benefit F55 (With 25 Years of Service)
1/1/1994	Member Contribution Rate 0.00%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

18 - General AFSCME after 12/1/10

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2011	Non Standard Compensation Definition
12/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
12/1/2010	10 Year Vesting
12/1/2010	Day of work defined as 80 Hours a Month for All employees.

18 - General AFSCME after 12/1/10

12/1/2010	Benefit C-1 (New)
12/1/2010	Member Contribution Rate 2.50%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

19 - Gen. SEIU hired after 7/1/2011

7/1/2018	Participant Contribution Rate 3.5%
12/1/2016	Service Credit Purchase Estimates - Yes
7/1/2016	Participant Contribution Rate 3%
1/1/2012	Non Standard Compensation Definition
7/1/2011	Benefit FAC-5 (5 Year Final Average Compensation)
7/1/2011	10 Year Vesting
7/1/2011	Day of work defined as 80 Hours a Month for All employees.
7/1/2011	Benefit C-1 (New)
7/1/2011	Member Contribution Rate 2.50%
7/10/1973	Covered by Act 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	Early Reduced (.5%) at Age 50 with 25 Years or Age 55 with 15 Years

20 - Gen. BCSA hired after 1/1/2012

12/1/2016	Service Credit Purchase Estimates - Yes
1/1/2012	Non Standard Compensation Definition
1/1/2012	Member Contribution Rate 2.50%
7/1/2011	Benefit FAC-3 (3 Year Final Average Compensation)
7/1/2011	10 Year Vesting
7/1/2011	Benefit C-1 (New)
7/10/1973	Covered by Act 88
7/1/1962	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 - GNL Trans hired after 3/1/10

1/1/2012	Non Standard Compensation Definition
3/1/2010	Benefit FAC-3 (3 Year Final Average Compensation)
3/1/2010	6 Year Vesting
3/1/2010	1.25% Multiplier
7/10/1983	Covered by ACT 88
7/1/1962	Fiscal Month - July
	Defined Benefit Normal Retirement Age - 60
	No Early Reduced Conditions

S1 - Surplus Unassociated

7/1/1962	Fiscal Month - July
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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
01 - Gnrl NonUn.	2.00%
10 - General AFSCME	2.00%
11 - Gnrl Transit	4.00%
12 - Gnrl BCSA	2.00%
13 - Gnrl Housing	4.00%
14 - SEIU Local	2.00%
15 - City Mngr.	4.00%
16 - Cntrl Disp.	4.00%
17 - Corr.Offrcs	4.00%
18 - General AFSCME after 12/1/10	2.00%
19 - Gen. SEIU hired after 7/1/2011	4.00%
20 - Gen. BCSA hired after 1/1/2012	4.00%
HA - GNL Trans hired after 3/1/10	4.00%

Withdrawal Rate Scaling Factor

Division	Withdrawal Rate Scaling Factor
All Divisions	70%

Miscellaneous and Technical Assumptions

Loads – None.

Amortization Policy for Closed Divisions

Closed Division	Amortization Option
13 - Gnrl Housing	Accelerated to 15-Year Amortization
16 - Cntrl Disp.	Accelerated to 5-Year Amortization

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

Risk Commentary

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

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

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

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

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

PLAN MATURITY MEASURES

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

1. Ratio of the market value of assets to total payroll	4.1
2. Ratio of actuarial accrued liability to payroll	7.8
3. Ratio of actives to retirees and beneficiaries	0.8
4. Ratio of market value of assets to benefit payments	7.6
5. Ratio of net cash flow to market value of assets (boy)	-4.8%

RATIO OF MARKET VALUE OF ASSETS TO TOTAL PAYROLL

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

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

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

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

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

RATIO OF MARKET VALUE OF ASSETS TO BENEFIT PAYMENTS

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

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

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

State Reporting

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

Form 5572		
Line Reference	Description	Result
10 Membership as of December 31, 2018		
11	Indicate number of active members	345
12	Indicate number of inactive members	48
13	Indicate number of retirees and beneficiaries	425
14 Investment Performance for Calendar Year Ending December 31, 2018¹		
15	Enter actual rate of return - prior 1-year period	-3.64%
16	Enter actual rate of return - prior 5-year period	4.94%
17	Enter actual rate of return - prior 10-year period	8.25%
18 Actuarial Assumptions		
19	Actuarial assumed rate of investment return ²	7.75%
20	Amortization method utilized for funding the system's unfunded actuarial accrued liability, if any	Level Percent
21	Amortization period utilized for funding the system's unfunded actuarial accrued liability, if any ³	20
22	Is each division within the system closed to new employees? ⁴	No
23 Uniform Assumptions		
24	Enter retirement pension system's actuarial value of assets using uniform assumptions	\$87,380,611
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions	\$162,217,681
27	Actuarially Determined Contribution (ADC) using uniform assumptions, Fiscal Year Ending June 30,2019	\$6,872,568

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