



Cavanaugh Macdonald
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Employees' Retirement System of the City of Milwaukee

Actuarial Valuation Report
Prepared as of January 1, 2019

June 11, 2019





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Annuity and Pension Board
Employees' Retirement System of the City of Milwaukee
789 North Water Street, Suite 300
Milwaukee, WI 53202

Members of the Board:

At your request, we performed an actuarial valuation of the Employees' Retirement System of the City of Milwaukee (referred to as "ERS") as of January 1, 2019. The report has been prepared in accordance with Section 36-15-15 of the Milwaukee City Charter (MCC). The major findings of the valuation are contained in this report, which reflects the benefit and funding provisions in place on January 1, 2019.

This is the first actuarial valuation report prepared by Cavanaugh Macdonald Consulting, LLC (CMC). As part of our transition work, we replicated the January 1, 2018 actuarial valuation. Results were within acceptable limits, but as is typical in a takeover situation, there were some differences in the key valuation metrics. Based on our experience, these differences are neither unusual nor significant. Our replication results were within 2% of the actuarial liability. Note that due to the change in retained actuary, information contained in this report for plan years prior to January 1, 2019 is based upon valuations performed by the prior actuary.

The valuation was based on the actuarial assumptions and methods adopted by the Annuity and Pension Board, as specified by the Charter. An amendment to the MCC was adopted by the Common Council on April 30, 2013 to establish the Stable Employer Contribution Policy. Under that Policy, an actuarial contribution rate is separately calculated for three groups: Policemen, Fireman, and General Employees of the Combined Fund, and is applicable for the subsequent five-year period. These rates are established every five years following the Experience Study, performed by the actuary. The actuarial determined employer contribution rates under the Stable Contribution Policy for Policemen, Firemen, and General Employees are 25.22%, 26.83% and 7.48% of covered payroll, respectively, through December 31, 2022.

The primary purpose of the valuation report is to determine the actuarial contribution rate, to describe the current financial condition of ERS, and to analyze changes in such condition. Use of this report for any other purposes or by anyone other than ERS and its auditors, may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. The attached pages should not be provided without a copy of this cover letter. Because of the risk of misinterpretation of actuarial results, you should ask Cavanaugh Macdonald Consulting (CMC) to review any statement you wish to make on the results contained in this report. CMC will not accept any liability for any such statement made without prior review.



In preparing our report, we relied, without audit, on information (some oral and some in writing) supplied by ERS staff. This information includes, but is not limited to, statutory provisions, member data and financial information. Although reviewed for reasonableness and consistency with the prior valuation, these elements have not been audited by CMC and we cannot certify as to the accuracy and completeness of the data supplied. The valuation results depend on the integrity of this information. If any of the information is inaccurate or incomplete, our results may be different and our calculations may need to be revised. Sometimes assumptions are made to interpret membership data that is imperfect. The valuation is also based on benefit and contribution provisions as presented in this report. If you have reason to believe that the plan provisions are incorrectly described, that important plan provisions relevant to this valuation are not described, or that conditions have changed since the calculations were made, you should contact the authors of this actuarial report prior to relying on this information.

There was a change in the actuarial assumptions from the prior valuation. The investment return assumption was lowered from 8.00% for calendar years through 2022 and 8.25% beginning in 2023 to 7.5% for all years. This change increased the liabilities and costs of ERS. More detailed information can be found in this report. The actuarial assumptions, other than the investment return assumption, were developed by the prior actuary. The analysis and recommendation regarding the investment return assumption was prepared by Cavanaugh Macdonald. The Board has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix C. We believe that these assumptions are appropriate and reasonable and also comply with all applicable Actuarial Standards of Practice (ASOPs). We certify that all costs and liabilities have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the plan and reasonable expectations) and which, in combination, offer the best estimate of anticipated experience affecting the plan. Nevertheless, the emerging costs will vary from those presented in this report to the extent actual experience differs from that projected by the actuarial assumptions.

Future actuarial results may differ significantly from the current results 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; 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) and changes in plan provisions or applicable law. Due to the limited scope of this assignment, CMC performed no analysis of the potential range of such future measurements.

Actuarial computations presented in this report are for purposes of evaluating the funding of the Plan and determining an actuarial contribution rate. Actuarial computations for purposes of fulfilling financial accounting requirements under Governmental Accounting Standard Number 67 and 68 are provided in separate reports. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Plan's funding requirements and goals. Determinations for other purposes may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.



On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualifications Standards to render the actuarial opinions contained in this report. In addition, this report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Respectfully submitted,

A handwritten signature in blue ink, appearing to be 'LL' with a stylized flourish at the end.

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink that reads 'Patrice Beckham' in a cursive script.

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary



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SECTION I: EXECUTIVE SUMMARY

Introduction and Background

The law governing the Employees' Retirement System (ERS) requires the Actuary and Pension Board to "...prepare an annual valuation of the assets and liabilities of the funds of the retirement system" (Section 36-15-15 of the Milwaukee City Charter (MCC)). Cavanaugh Macdonald Consulting, the Actuary, has completed the eighty-first annual actuarial valuation of the ERS as of January 1, 2019. The primary purposes of performing a valuation are to:

- estimate the liabilities for future benefits expected to be paid by the System;
- determine the employer contribution rate required to fund the System on an actuarial basis and compare that rate to the Stable Contribution Policy;
- disclose certain asset and liability measures, and the funded status, as of the valuation date;
- monitor any deviation between actual plan experience and experience projected by the actuarial assumptions, and
- analyze and report on any significant trends in contributions, assets and liabilities over the past several years.

Stable Contribution Policy

An amendment to the MCC was adopted by the Common Council on April 30, 2013 to establish the Stable Employer Contribution Policy. Under that Policy, an actuarial contribution rate is separately calculated for three groups: Policemen, Fireman, and General Employees of the Combined Fund, and is applicable for the subsequent five-year period. The Policy is designed to:

- (a) Fully fund all current costs for active members, determined under the funding method, which is irrespective of the funded status of the System. The result is that the Employer Normal Cost is always funded; and
- (b) Liquidate the unfunded actuarial accrued liability (UAAL), if any, over the amortization period adopted by the Board and based on methodology specified in the MCC. Effective with the January 1, 2019 actuarial valuation, the Board adopted a 25-year closed period to amortize the existing UAAL. At each subsequent valuation date, any changes to the UAAL arising from actual experience that is different than assumed will be amortized over a fixed 15-year period and any changes to the UAAL arising from changes in assumptions will be amortized over a fixed 25-year period.

These rates are established every five years following the Experience Study, based on a study performed by the actuary. The actuary establishes these rates based on the actuarial assumptions adopted by the Annuity and Pension Board of the ERS and the actuarial methods specified in the Charter. The rates are established in conformity with applicable Actuarial Standards of Practice and result in a funded status at the end of the five years that is at least actuarially equivalent to the expected funded status if contributions were based on the redevelopment of the employer contribution rates annually under the same assumptions and methods. The current actuarial contribution rates under the Stable Employer Contribution Policy are:

- General Employees: 7.48%
- Policemen: 25.22%
- Firemen: 26.83%.

These contribution rates are in effect for employer contributions for calendar years 2018 through 2022. The results of the January 1, 2019 actuarial valuation are among the information used to monitor the impact of the Stable Employer Contribution Policy on the System's funding and anticipate possible adjustments when the rate is reset for 2023.



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Significant Change Since Last Year's Valuation:

- The Board voted to lower the investment return assumption from 8.00% for calendar years 2018 through 2022 and 8.25% beginning in 2023 to 7.50% for all years, effective with the January 1, 2019 valuation.
- Actual vs expected experience: The return on the market value of assets during calendar year 2018 was -2.91%, as reported by Northern Trust (ERS' custodian), compared to the 8.00% assumed rate of return for 2018.
- The Global Pension Settlement (GPS) provides that members enrolled through June 28, 2000, must provide written consent to the ERS in order to be eligible for the benefit enhancements of GPS. Members enrolled after June 28, 2000 are automatically participants in the Combined Fund. Since the January 1, 2018 valuation, nine individuals who were eligible for ERS benefits as of June 28, 2000 – and who had not previously consented to GPS – have now consented. As a result, assets have been transferred from the non-consenter funds in which these members previously participated to the Combined Fund.
- The Board modified the amortization of the unfunded actuarial accrued liability by setting the initial amortization base (layer) equal to the unfunded actuarial accrued liability as of January 1, 2019 and amortized over 25 years.
- This is the first actuarial valuation report prepared by Cavanaugh Macdonald Consulting, LLC (CMC). As part of our transition work, we replicated the January 1, 2018 actuarial valuation. Results were within acceptable limits, but as is typical in a takeover situation, there were some differences in the key valuation metrics.
- Benefit changes: none

Fiscal Impact of Changes

Change to the Investment Return Assumption: The reduction to the investment return assumption had a significant impact on the January 1, 2019 valuation results, increasing the actuarial accrued liability across all funds by \$450 million and decreasing the funded ratio by 6.2%. The impact of the assumption change on the January 1, 2019 valuation results across all funds is summarized in the following table (\$ thousands):

	Prior Assumption	Current Assumption	Change
Actuarial Accrued Liability (AAL)	\$5,951,284	\$6,400,901	\$449,617
Actuarial Value of Assets (AVA)	<u>5,218,294</u>	<u>5,218,294</u>	<u>0</u>
Unfunded AAL (UAAL)	\$ 732,990	\$1,182,607	\$449,617
Funded Ratio	87.7%	81.5%	(6.2%)
Employer Normal Cost	\$ 49,419	\$ 61,514	\$12,095
Administrative Expense	5,790	5,790	0
UAAL Amortization Payment	<u>55,152</u>	<u>84,449</u>	<u>29,297</u>
Actuarial Determined Contribution	\$110,361	\$151,753	\$41,392



SECTION I: EXECUTIVE SUMMARY

Actual 2018 Rate of Return: The return on the market value for 2018, as reported by ERS' custodian, Northern Trust, was -2.91% compared to the 8.00% assumed rate of return. Even with the asset smoothing method, the impact on the valuation was significant. The unfunded actuarial accrued liability increased by \$137 million, the funded ratio declined by 2.1% and the actuarial employer contribution rate increased. The net deferred investment gain of \$163 million that existed in the January 1, 2018 valuation has been eliminated and replaced by a net deferred investment loss of \$267 million. Absent offsetting favorable experience in the future, this experience will flow through the asset smoothing method, lowering the funded ratio and increasing the actuarial contributions.

GPS Consenters during 2018: There were nine individuals who elected to participate in the Combined Fund during 2018. They represent about 3% of the total non-consenters. Due to the small number of individuals who consented and the associated liability, this did not have a significant impact on the valuation results.

Change in UAAL Amortization: The reset of the UAAL amortization did not have a significant impact on the valuation results. The UAAL as of January 1, 2018 was amortized over a closed 25-year period so 24 years remained as of this valuation date. The actuarial loss for 2018 was scheduled to be amortized over 15 years and the increase in the UAAL due to the change in the investment return assumption would have been amortized over 25 years based on the prior amortization policy. In aggregate, the decision to establish one amortization base, equal to the UAAL as of January 1, 2019, did not significantly change the actuarial contribution amounts.

Transition Results: Our replication results were within 2% on the actuarial accrued liability across all funds. For transition purposes, this is well within acceptable limits. The comparison of key valuation results on the January 1, 2018 valuation across all funds is summarized in the following table (\$ thousands):

	Buck	CMC	Difference
Actuarial Accrued Liability (AAL)	\$5,819,762	\$5,716,533	(\$103,229)
Actuarial Value of Assets (AVA)	<u>5,233,486</u>	<u>5,233,486</u>	<u>0</u>
Unfunded AAL (UAAL)	\$ 586,276	\$ 483,047	(\$103,229)
Funded Ratio	89.9%	91.6%	1.7%
Employer Normal Cost	\$37,268	\$43,073	\$5,805
UAAL Amortization Payment	<u>45,028</u>	<u>36,976</u>	<u>(8,052)</u>
Actuarial Determined Contribution	\$82,296	\$80,049	(\$2,247)

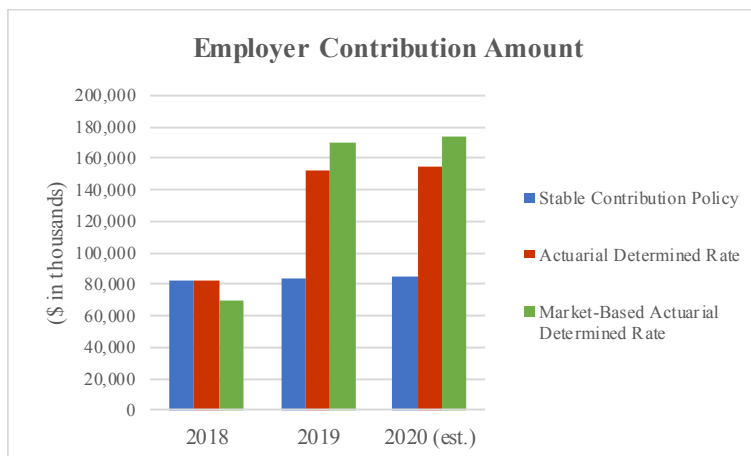


SECTION I: EXECUTIVE SUMMARY

Due to the Stable Employer Contribution Policy, these events had no impact on the contribution amounts determined for the 2019 plan year, but the impact is reflected in the actuarially determined employer contribution rate. As a result, there is a significant difference between the actuarially determined contribution rate and the stable contribution policy rate as shown below:

Group	Employer Rate Based On:		
	Stable Contribution Policy	Actuarial Determined Rate	Market-Based Actuarial Determined Rate
General	7.48%	15.57%	17.70%
Policemen	25.22%	41.31%	46.08%
Firemen	26.83%	48.71%	54.25%

Under the Stable Contribution Policy, the employer contribution rate is reset every five years following the completion of the Experience Study. The contribution rate was most recently set for calendar years 2018 through 2022. As the following graph illustrates the stable contribution rate for 2018 was equal to the actuarial determined contribution in the 2018 valuation. However, because of the significant change in the investment return assumption to 7.50% (down from 8.24%), and to a lesser extent because of the negative investment return in 2018 (-2.91%), the actuarially determined employer contribution is much higher in the 2019 valuation (used for 2019 and 2020).



Given the magnitude of the difference between the actuarially determined contributions and the stable contribution policy contributions, particularly on a market-based calculation, it would be prudent for the City and other participating agencies to start preparing now for higher contributions when the Stable Contribution Policy is reset for calendar year 2023.

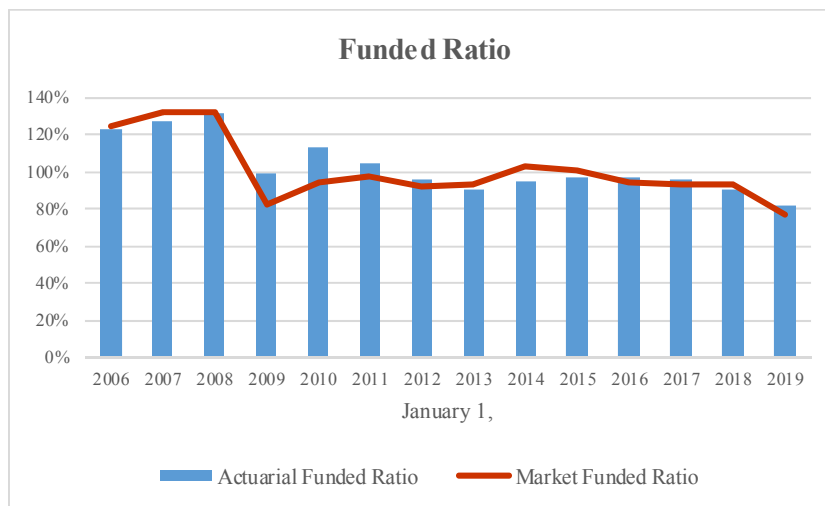
Funded Ratio

As was discussed earlier, the funded ratio in the 2019 valuation dropped significantly due to the change in the investment return assumption, along with a negative return on the market value of assets. However,



SECTION I: EXECUTIVE SUMMARY

historically, ERS has been a very well-funded System.



A number of factors impact the funded ratio from year to year. The major drivers of the decrease in the funded ratio from the January 1, 2018 valuation to the January 1, 2019 valuation are shown in the following table. The most significant factors (change to assumptions and investment experience) have already been discussed, but there were two other factors that impacted the change in the funded ratio. As was mentioned earlier, as part of the transition from the prior actuary, Cavanaugh Macdonald Consulting replicated the January 1, 2018 actuarial valuation. Our results were within acceptable limits, but our actuarial accrued liability was lower than the prior actuary’s which increased the funded ratio. The decrease in the funded ratio due to liability experience is due to actual versus expected demographic experience, but also reflects an improvement in the data collection process. At CMC’s request, the System provided several data items this year that previously were not included in the actuary’s data, including the actual survivorship percentage for certain members in-pay status, actual benefit amounts for terminated vested members and actual beneficiary dates of birth.

	Funded Ratio Based On	
	Actuarial Value of Assets	Market Value of Assets
January 1, 2018 Funded Ratio	89.9%	92.7%
- Expected change	0.1%	0.2%
- Change due to actuary	1.7%	1.8%
- Change due to assumptions	(6.6%)	(6.8%)
- Change due to asset return	(2.1%)	(9.1%)
- Change due to liabilities	<u>(1.5%)</u>	<u>(1.4%)</u>
- Total change	(8.4%)	(15.3%)
January 1, 2019 Funded Ratio	81.5%	77.4%



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Summary of Key Valuation Results

This report, prepared as of January 1, 2019, presents the results of the eighty-first annual valuation of the system. The principal results of the valuation, reflecting the Stable Contribution Funding Policy, are summarized below:

Fund	General Employees	Policemen	Firemen	Total
Combined Fund	\$ 28,985,051	\$ 43,603,007	\$ 17,683,284	\$ 90,271,342
Retirement Fund	0	0	0	0
Duty Disability Fund	0	0	0	0
Heart & Lung Fund	N/A	N/A	0	0
Combined Retirement & Disability Fund	227,000	39,000	0	266,000
Total Contribution	\$ 29,212,051	\$ 43,642,007	\$ 17,683,284	\$ 90,537,342
Covered Compensation	\$ 360,750,000	\$ 159,971,000	\$ 60,942,000	\$ 581,663,000
Total Contribution as a Percentage of Covered Compensation	8.10%	27.28%	29.02%	15.57%

Key Takeaways

- This is the first valuation of CMERS produced by Cavanaugh Macdonald Consulting. During the transition we replicated results within acceptable limits. In addition, we worked with staff to improve the data collection process.
- The change in investment return assumption rate from 8.00% for calendar years 2018 through 2022 and 8.25% beginning with calendar year 2023 to 7.50% resulted in a significant increase in the actuarially determined employer contributions and decrease in the funded status.
- Investment returns that were less than expected during 2018 led to an increase in the actuarially determined employer contributions and a decrease in the funded status.
- Due to the market value return during calendar year 2018, the net deferred investment experience is a loss of \$267 million. Absent offsetting favorable experience, this experience will flow through the asset smoothing method, lowering the funded ratio and increasing the actuarial contributions over the next few years.
- **Given the significant difference between the actuarially determined contribution and the stable contribution policy in this valuation, the City and participating agencies should give serious consideration to increasing contributions and planning for a major increase in the contribution rate when it is reset in 2023.**



SECTION I: EXECUTIVE SUMMARY

A typical retirement plan faces many different risks. The term “risk” is most commonly associated with an outcome with undesirable results. However, in the actuarial world risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. Actuarial Standard of Practice Number 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions. Risk evaluation is an important part of managing a defined benefit plan. Please see the Risk Considerations section of this report for an in-depth discussion of the specific risks facing CMERS.

We conclude this executive summary by presenting comparative statistics and actuarial information from both the January 1, 2018 and January 1, 2019 valuations.



SECTION I: EXECUTIVE SUMMARY

Summary of Principal Results

	January 1, 2019	January 1, 2018	% Change
1. Membership Data			
a. Active Members			
(i) Count			
- General Employees	8,228	8,289	(0.7%)
- Policemen	1,916	1,855	3.3%
- Firemen	<u>707</u>	<u>701</u>	0.9%
- Total	10,851	10,845	0.1%
(ii) Total Estimated Payroll			
- General Employees	\$360,750,000	\$359,914,000	0.2%
- Policemen	159,971,000	157,864,000	1.3%
- Firemen	<u>60,942,000</u>	<u>59,340,000</u>	2.7%
- Total	\$581,663,000	\$577,118,000	0.8%
b. Retirees, Beneficiaries and Disabled Members			
(i) Number	13,370	13,196	1.3%
(ii) Total Annual Benefits	\$383,041,000	\$357,795,000	7.1%
(iii) Average Annual Benefit	\$28,649	\$27,114	5.7%
2. Assets and Liabilities			
a. Asset Values (includes contributions receivable)			
(i) Actuarial Value of Assets (AVA)	\$5,218,294,000	\$5,233,486,000	(0.3%)
(ii) Market Value of Assets (MVA)	\$4,950,881,000	\$5,396,527,000	(8.3%)
b. Actuarial Accrued Liability (AAL)	\$6,400,901,000	\$5,819,762,000	10.0%
c. Funded Status			
(i) Unfunded AAL (Based on AVA)	\$1,182,607,000	\$586,276,000	101.7%
(ii) Funded Ratio (Based on AVA)	81.52%	89.93%	(9.4%)
(iii) Unfunded AAL (Based on MVA)	\$1,450,020,000	\$423,235,000	242.6%
(iv) Funded Ratio (Based on MVA)	77.35%	92.73%	(16.6%)
3. Employer Contribution Rates (Combined Fund)			
a. General Employees			
(i) Stable Contribution Policy Rate	7.48%	7.48%	0.0%
(ii) Actuarial Determined Rate	15.57%	7.46%	108.7%
(iii) Market-Based Actuarial Determined Rate	17.70%	6.02%	194.0%
b. Policemen			
(i) Stable Contribution Policy Rate	25.22%	25.22%	0.0%
(ii) Actuarial Determined Rate	41.31%	25.13%	64.4%
(iii) Market-Based Actuarial Determined Rate	46.08%	22.03%	109.2%
c. Firemen			
(i) Stable Contribution Policy Rate	26.83%	26.83%	0.0%
(ii) Actuarial Determined Rate	48.71%	26.74%	82.2%
(iii) Market-Based Actuarial Determined Rate	54.25%	23.38%	132.0%
4. Total Employer Contribution (All Funds)	Due 01/31/2020	Due 01/31/2019	
(i) Annual Cost	\$90,537,000	\$89,766,000	0.9%
(ii) As a % of Covered Payroll	15.57%	15.55%	0.1%

Note: the investment return assumption was changed with the January 1, 2019 valuation.



SECTION II: SCOPE OF THE REPORT

This report presents the actuarial valuation of the Employees' Retirement System of the City of Milwaukee as of January 1, 2019. This valuation was prepared at the request of the System's Pension and Annuity Board. The report is based on plan provisions, actuarial assumptions and actuarial methods that are unchanged from last year with the exception of the investment return assumption. The Board voted to reduce the investment return assumption to 7.50%, effective with the January 1, 2019 valuation.

Please pay particular attention to our cover letter, where the guidelines employed in the preparation of this report are outlined. We also comment on the sources and reliability of both the data and the actuarial assumptions upon which our findings are based. Those comments are the basis for our certification that this report is complete and accurate to the best of our knowledge and belief.

A summary of the findings resulting from this valuation is presented in the previous section. Section III summarizes the membership data as of the valuation date. Section IV describes the assets and investment experience of the System. Section V discloses the obligations (liabilities) of the System and Section VI includes the calculation of contributions for the current fiscal year. Section VII discloses key maturity measurements and discusses the key risks facing the funding of the System.

This report includes several appendices:

- Appendix A Schedules of valuation data classified by various categories of members.
- Appendix B A summary of the current benefit structure, as determined by the provisions of governing law on the valuation date.
- Appendix C A summary of the actuarial methods and assumptions used to estimate liabilities and determine contribution rates.
- Appendix D A glossary of actuarial terms.



SECTION III: MEMBER DATA SUMMARY

TABLE 1

Member Counts by Vested Status

Number of Members	1/1/2019			1/1/2018
	Vested	Non-Vested	Total	Total
Active				
- General Employees	5,306	2,922	8,228	8,289
- Policemen	1,488	428	1,916	1,855
- Firemen	<u>603</u>	<u>104</u>	<u>707</u>	<u>701</u>
- Total Active Members	7,397	3,454	10,851	10,845
Inactive				
- Deferred Retirees			2,994	3,135
- Refunds Payable			<u>1,366</u>	<u>0</u>
- Total Inactive Members			4,360	3,135
Benefit Recipients				
- Combined Fund				
General Employees			9,589	9,446
Policemen			2,411	2,386
Firemen			<u>1,355</u>	<u>1,349</u>
- Combined Fund Subtotal			13,355	13,181
- Retirement Fund			15	15
- Duty Disability Funds				
General Employees			0	0
Policemen			0	0
Firemen			<u>0</u>	<u>0</u>
- Duty Disability Funds Subtotal			0	0
- Firemen's Heart & Lung Fund			<u>0</u>	<u>0</u>
- Total Benefit Recipients			13,370	13,196
Total Membership			28,581	27,176

Note: Members are vested once they attain four years of service.



SECTION III: MEMBER DATA SUMMARY

TABLE 2

Member Counts by Consent Status

1/1/2018 Membership			
Number of Members	Consenters	Others	Total
Active			
- General Employees	8,167	61	8,228
- Policemen	1,915	1	1,916
- Firemen	<u>707</u>	<u>0</u>	<u>707</u>
- Total Active Members	10,789	62	10,851
Inactive			
- Deferred Retirees	2,777	217	2,994
- Refunds Due	<u>1,362</u>	<u>4</u>	<u>1,366</u>
- Total Inactive Members	4,139	221	4,360
Benefit Recipients			
- Combined Fund	13,355	NA	13,355
- Retirement Fund	NA	15	15
- Duty Disability Funds			
General Employees	0	0	0
Policemen	0	0	0
Firemen	<u>0</u>	<u>0</u>	<u>0</u>
- Duty Disability Funds Subtotal	0	0	0
- Firemen's Heart & Lung Fund	<u>0</u>	<u>0</u>	<u>0</u>
- Total Benefit Recipients	13,355	15	13,370
Total Membership	28,283	298	28,581

Note: In addition to the above, there are members who have separated from service without vested rights to either a pension or a refund of accumulated contributions. There is no current actuarial liability for such individuals, and their membership will be terminated if they do not return to active service within five years of their date of separation from ERS covered employment.



SECTION III: MEMBER DATA SUMMARY

TABLE 3

Member Data Summary

	1/1/2019	1/1/2018
Projected Annual Earnings		
- General Employees	\$ 360,750,000	\$ 359,914,000
- Policemen	159,971,000	157,864,000
- Firemen	<u>60,942,000</u>	<u>59,340,000</u>
- Total Projected Annual Earnings	\$ 581,663,000	\$ 577,118,000
Average Projected Earnings		
- General Employees	\$ 43,844	\$ 43,421
- Policemen	\$ 83,492	\$ 85,102
- Firemen	\$ 86,198	\$ 84,651
Annual Benefit Payments Currently Being Made		
- Combined Fund	\$ 382,846,718	\$ 357,665,652
- Retirement Fund	\$ 194,122	\$ 129,744
- Duty Disability Funds		
General Employees	\$ 0	\$ 0
Policemen	0	0
Firemen	<u>0</u>	<u>0</u>
- Duty Disability Funds Subtotal	\$ 0	\$ 0
- Firemen's Heart & Lung Fund	\$ <u>0</u>	\$ <u>0</u>
- Total Benefit Payments	\$ 383,040,840	\$ 357,795,396

- Notes: (1) "Projected Annual Earnings" represents the expected earnable compensation for the year following the valuation date.
- (2) "Annual Benefit Payments Currently Being Made" equals 12 times the full December monthly payment. The amounts shown include all amounts payable by the ERS, and have been reduced by workers' compensation offsets for members who are currently repaying a workers' compensation award.
- (3) Active members who worked fewer than 100 hours in the prior year, but who have not officially terminated employment are included in the count of inactive members in Table 1 and Table 2. These members are not assumed to earn additional service in future years.



SECTION IV: ASSET DATA

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is January 1, 2019. On that date, the assets available for the payment of benefits are appraised. The assets are compared with the liabilities of the System, which are generally in excess of assets. The actuarial process then leads to a method of determining the contributions needed by members and the employer in the future to balance the System's assets and liabilities.

Market Value of Assets

The current market value represents the "snapshot" or "cash-out" value of System assets as of the valuation date. In addition, the market value of assets provides a basis for measuring investment performance during the year. Table 4 summarizes the change in the market value of assets from January 1, 2018 to January 1, 2019.

Actuarial Value of Assets

Neither the market value of assets, representing a "cash-out" value of System assets, nor the book values of assets, representing the cost of investments, may be the best measure of the System's ongoing ability to meet its obligations.

To arrive at a suitable value of assets for the actuarial valuation, a technique for determining the actuarial value of assets is used which dampens swings in the market value while still indirectly recognizing market values. Under the asset smoothing methodology, the difference between the actual and assumed investment return on the market value of assets is recognized evenly over a five-year period.

Table 5 shows the development of the actuarial value of assets (AVA) as of the valuation date.



SECTION IV: ASSET DATA

TABLE 4

Market Value of Assets
(Dollars in thousands)

	Global Combined Fund	Retirement Fund	Combined Retirement Fund	General Employees' Duty Disability Fund	Employers' Reserve Fund	Securities Lending Fund	Total
1. Market Value of Assets as of December 31, 2017	\$ 5,361,679	\$ 12,850	\$ 4,736	\$ 108	\$ 15,637	\$ 1,517	\$ 5,396,527
2. Contributions During Year							
a. Member	\$ 32,067	\$ 15	\$ 3	\$ 0	\$ 0	\$ 0	\$ 32,085
b. Employer	83,000	0	166	0	0	0	83,166
c. Total	\$ 115,067	\$ 15	\$ 169	\$ 0	\$ 0	\$ 0	\$ 115,251
3. Disbursements During Year							
a. Monthly Annuities	\$ 388,758	\$ 98	\$ 33	\$ 0	\$ 0	\$ 0	\$ 388,889
b. Refunds	4,537	71	29	0	0	0	4,637
c. Administrative Expenses	5,649	0	0	0	0	1,532	7,181
d. Total	\$ 398,944	\$ 169	\$ 62	\$ 0	\$ 0	\$ 1,532	\$ 400,707
4. Investment Return (net of Administrative Expenses)	\$ (161,252)	\$ (281)	\$ (103)	\$ (3)	\$ 257	\$ 1,192	\$ (160,190)
5. Market Value of Assets as of December 31, 2018 (1) + (2c) - (3d) + (4)	\$ 4,916,550	\$ 12,415	\$ 4,740	\$ 105	\$ 15,894	\$ 1,177	\$ 4,950,881
6. Rate of Return, as Reported by Northern Trust (ERS' Custodian)							(2.91%)



SECTION IV: ASSET DATA

TABLE 5
Actuarial Value of Assets
(Dollars in thousands)

1. Preliminary Actuarial Value as of January 1, 2018	\$	5,233,122
2. Market Value January 1, 2018 (Unaudited)	\$	5,396,527
3. Market Value January 1, 2019 (Unaudited)	\$	4,950,881
4. Contributions		
a. Member	\$	32,085
b. Employer		83,166
c. Total	\$	<u>115,251</u>
5. Benefit Payments and Expenses	\$	400,707
6. Actual Market Return, Net of Administrative Expenses	\$	(160,190)
7. Expected Market Return based on 8.00%	\$	420,524
8. Excess of Actual over Expected Return		
a. 2018	\$	(580,714)
b. 2017		387,130
c. 2016		(6,461)
d. 2015		(374,012)
e. 2014	\$	(170,983)
9. Excess Recognized in the Current Valuation		
a. 2018	\$	(116,143)
b. 2017		77,426
c. 2016		(1,292)
d. 2015		(74,802)
e. 2014		(34,195)
f. Total	\$	<u>(149,006)</u>
10. Preliminary Value as of January 1, 2019 (1) + (4c) - (5) + (7) + (9f)	\$	5,219,184
11. Ratio of Preliminary Value to Market Value* (10)/(3)		105.42%
12. Balance in Employers' Reserve Fund and Securities Lending Fund	\$	17,071
13. Market Value Excluding Employers' Reserve Fund and Securities Lending Fund (3) - (12)	\$	4,933,810
14. Actuarial Value as of January 1, 2019 (11) * (13) + (12)	\$	5,218,294
15. Estimated Rate of Return		5.33%



SECTION IV: ASSET DATA

TABLE 6

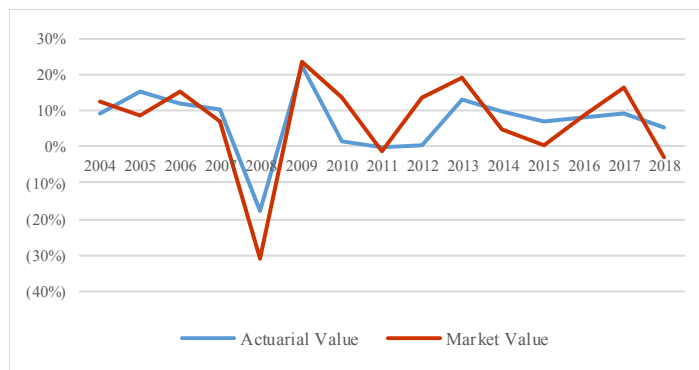
Historical Asset Returns

Beginning with the January 1, 2019 valuation, it is assumed that plan assets will earn a 7.50% asset return. The table below provides a history of the Actuarial Value and Market Value of Asset returns. Note that the System utilized a 10% asset corridor prior to 2009, which impacted the calculation of the actuarial value of assets and, therefore, the return on the actuarial value of assets. Rates of return on a market value basis are provided by the System’s custodian, Northern Trust.

Year	Actuarial Value of Assets	Market Value of Assets
2004	9.49%	12.61%
2005	15.34%	8.46%
2006	11.83%	15.13%
2007	10.17%	7.21%
2008	(17.88%)	(30.84%)
2009	22.62%	23.30%
2010	1.34%	13.86%
2011	(0.09%)	(1.43%)
2012	0.43%	13.88%
2013	12.85%	19.29%
2014	9.91%	5.09%
2015	7.00%	0.54%
2016	8.33%	8.83%
2017	9.09%	16.38%
2018	5.33%	(2.91%)
Average*	7.05%	7.29%
Max	22.62%	23.30%
Min	(17.88%)	(30.84%)
Range	40.50%	54.14%

Note: Rates of return on Actuarial Value of Assets prior to 2018 were provided by the prior actuary.

* Average is calculated on an arithmetic basis.





SECTION IV: ASSET DATA

TABLE 7

Allocation of Assets Among Funds
(Dollars in thousands)

As part of the financial statements, the System provides a breakdown of the total market value of assets by Fund. The Employer Reserve Fund and Security Lending Fund are valued at market value for actuarial purposes and earmarked for specific purposes other than directly funding the benefits of the System's members. The actuarial value of assets is determined in total and then adjusted by subtracting the Employer Reserve Fund and Security Lending Fund. The remaining actuarial value of assets is then allocated to each Fund based on its portion of the total market value.

Fund	Market Value	Actuarial Value
1. Combined Fund	\$ 4,916,550	\$ 5,183,027
2. Employers' Reserve Fund	\$ 15,894	\$ 15,894
3. Retirement Fund	\$ 12,415	\$ 13,088
4. General Employees' Duty Disability Fund	\$ 105	\$ 111
5. Fire & Police Duty Disability Fund	\$ 0	\$ 0
6. Firemen's Heart & Lung Fund	\$ 0	\$ 0
7. Combined Retirement & Disability Fund	\$ 4,740	\$ 4,997
8. Securities Lending Fund	\$ 1,177	\$ 1,177
9. Total All Funds	\$ 4,950,881	\$ 5,218,294

Note: Values shown include January 31, 2019 contributions receivable.



SECTION IV: ASSET DATA

TABLE 8
Allocations Between Non-Consenters Who Consented to GPS During 2018 and Those Who Did Not
(Dollars in thousands)

The Global Pension Settlement (GPS) provides that members enrolled through June 28, 2000 must provide written consent to the ERS in order to be eligible for the benefit enhancements of GPS. Members enrolled after June 28, 2000 are automatically participants in the Combined Fund. Since the January 1, 2018 valuation, nine individuals who were eligible for ERS benefits as of June 28, 2000 – and who had not previously consented to GPS – have now consented.

GPS provides that the market value of the assets in the funds for Non-Consenters be divided among Consenters and Non-Consenters. The division is based on the actuarial accrued liability covered by each fund under the pre-GPS plan provisions. The required division of assets for members who consented during 2018 was calculated as of January 1, 2018. As a result, assets will be transferred from the non-consenter Funds in which these members previously participated to the Global Combined Fund, as shown below.

Fund	Allocation of 1/1/2018 Market Value of Assets in Funds for Non-Consenters in Proportion to 1/1/2018 Actuarial Accrued Liability			Allocation of 1/31/2019 Employer Contribution to Funds for Non-Consenters in Proportion to 1/1/2018 Covered Compensation		
	Consenters in 2018	Others	Total (Audited)	Consenters in 2018	Others	Total
1. Retirement Fund	\$ 2,058	\$ 10,792	\$ 12,850	\$ 0	\$ 0	\$ 0
2. General Employees' Duty Disability Fund	19	88	107	0	0	0
3. Fire & Police Duty Disability Fund	0	0	0	0	0	0
4. Firemen's Heart & Lung Fund	0	0	0	0	0	0
5. Combined Retirement & Disability Fund	22	4,714	4,736	2	163	165
6. Total Funds for Non-Consenters	\$ 2,099	\$ 17,693	\$ 17,693	\$ 2	\$ 163	\$ 165

Notes: (i) January 1, 2018 assets allocated to members who consented to Global Settlement during 2018 are transferred to the Combined Fund as of January 1, 2018.
(ii) January 31, 2019 Employer Contributions allocated to members who consented to Global Settlement during 2018 are credited to the Combined Fund instead of to the funds for non-consenters.



SECTION V: SYSTEM LIABILITIES

In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of the System's assets as of the valuation date, January 1, 2019. In this section, the discussion will focus on the commitments (future benefit payments) of the System, which are referred to as its liabilities.

Table 9 contains an analysis of the actuarial present value of all future benefits (PVFB) for contributing members, inactive members, retirees and their beneficiaries.

The liabilities summarized in Table 9 include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes the measurement of both benefits already earned and future benefits to be earned. For all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and for the lives of the surviving beneficiaries.

All liabilities reflect the benefit provisions in place as of January 1, 2019.

Actuarial Accrued Liability

A fundamental principle in financing the liabilities of a retirement program is that the cost of its benefits should be related to the period in which benefits are earned, rather than to the period of benefit distribution. An actuarial cost method is a mathematical technique that allocates the present value of future benefits into annual costs. In order to do this allocation, it is necessary for the funding method to "breakdown" the present value of future benefits into two components:

- (1) that which is attributable to the past and
- (2) that which is attributable to the future.

Actuarial terminology calls the part attributable to the past the "past service liability" or the "actuarial accrued liability." The portion allocated to the future is known as the present value of future normal costs, with the specific piece of it allocated to the current year being called the "normal cost." Table 9 contains the calculation of actuarial accrued liability for the System. The Entry Age Normal actuarial cost method is used to develop the actuarial accrued liability.

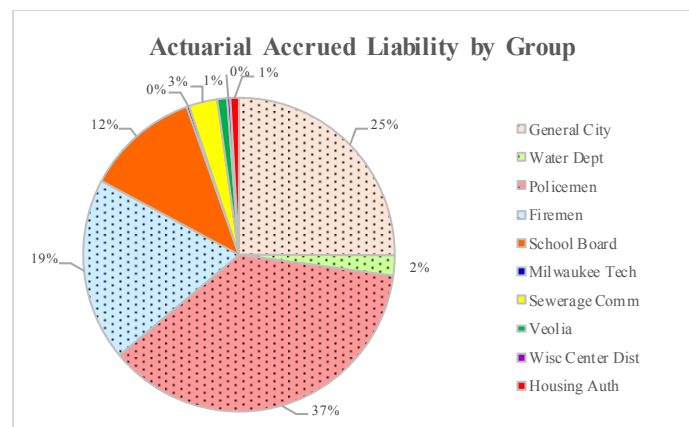


SECTION V: SYSTEM LIABILITIES

TABLE 9
Actuarial Accrued Liability By Agency
 (Dollars in thousands)

	General City*	Water Department	School Board	Milwaukee Technical College	Sewerage Commission	Veolia	Wisconsin Center District	Housing Authority	Policemen	Firemen	Total
1. Present Value of Future Benefits for Active Members											
a. Retirement Benefits	465,094	50,872	246,178	0	48,685	11,305	8,341	26,325	1,015,653	399,055	2,271,508
b. Withdrawal Benefits	35,504	3,139	21,466	0	3,659	38	709	1,492	41,843	16,276	124,126
c. Disability Benefits	11,388	1,140	6,455	0	1,145	71	226	532	29,682	52,230	102,869
d. Death Benefits	5,582	650	3,049	0	627	120	141	322	6,502	3,535	20,528
Total	517,568	55,801	277,148	0	54,116	11,534	9,417	28,671	1,093,680	471,096	2,519,031
2. Present Value of Future Normal Costs	118,853	12,048	77,343	0	12,028	823	3,062	5,770	376,954	154,088	760,969
3. Actuarial Accrued Liability (AAL) for Active Members (1) - (2)	398,715	43,753	199,805	0	42,088	10,711	6,355	22,901	716,726	317,008	1,758,062
4. Present Value of Future Benefits for Inactive Members											
- Members with Deferred Benefits	47,260	2,308	44,402	0	3,231	256	1,709	1,839	41,220	7,137	149,362
- Members with Refunds Payable	944	53	1,271	0	11	0	27	20	121	7	2,454
- Retirees, Beneficiaries and Disabled Members	1,158,042	87,077	507,514	16,768	144,251	54,295	12,907	31,673	1,596,142	882,354	4,491,023
Total	1,206,246	89,438	553,187	16,768	147,493	54,551	14,643	33,532	1,637,483	889,498	4,642,839
5. Total Actuarial Accrued Liability (3) + (4)	1,604,961	133,191	752,992	16,768	189,581	65,262	20,998	56,433	2,354,209	1,206,506	6,400,901

* Includes Elected Officials and Redevelopment Authority





SECTION V: SYSTEM LIABILITIES

TABLE 10

Funded Status on Actuarial and Market Value by Fund
(Dollars in thousands)

Fund	Actuarial Accrued Liability (AAL)	Actuarial Value of Assets (AVA)	Market Value of Assets (MVA)	Unfunded Actuarial Accrued Liability Based on AVA (UAAL)	Unfunded Actuarial Accrued Liability Based on MVA (UAAL)	Percent Funded Based on AVA	Percent Funded Based on MVA
1. Combined Fund	\$ 6,387,726	\$ 5,183,027	\$ 4,916,550	\$ 1,204,699	\$ 1,471,176	81.1%	77.0%
2. Employers' Reserve Fund	0	15,894	15,894	(15,894)	(15,894)	N/A	N/A
3. Retirement Fund	6,324	13,088	12,415	(6,764)	(6,091)	207.0%	196.3%
4. General Employees' Duty Disability Fund	18	111	105	(93)	(87)	616.7%	583.3%
5. Fire & Police Duty Disability Fund	0	0	0	0	0	N/A	N/A
6. Firemen's Heart & Lung Fund	0	0	0	0	0	N/A	N/A
7. Combined Retirement & Disability Fund	6,833	4,997	4,740	1,836	2,093	73.1%	69.4%
8. Securities Lending Fund	0	1,177	1,177	(1,177)	(1,177)	N/A	N/A
9. Total All Funds	\$ 6,400,901	\$ 5,218,294	\$ 4,950,881	\$ 1,182,607	\$ 1,450,020	81.5%	77.3%



SECTION V: SYSTEM LIABILITIES

TABLE 11

Reconciliation of Unfunded Actuarial Accrued Liability

The table below provides a reconciliation of the prior valuation's unfunded actuarial accrued liability to the current valuation's unfunded actuarial accrued liability for the Combined Fund.

Combined Fund	(\$ in thousands)
Unfunded Actuarial Accrued Liability (UAAL) as of 01/01/2018	\$ 607,376
- Expected Change in UAAL	46,829
- Contribution Above Actuarial Rate	(298)
- Investment Experience	137,068
- Demographic Experience	110,966
- Assumption Changes	448,596
- Transition Process	(102,994)
- Other Experience	(42,845)
Unfunded Actuarial Accrued Liability (UAAL) as of 01/01/2019	\$ 1,204,698



SECTION V: SYSTEM LIABILITIES

TABLE 12

**Actuarial Balance Sheet
As of January 1, 2019**

The valuation balance sheet shows the assets and liabilities of ERS (in total, all groups and all Funds). The items shown in the balance sheet are present values actuarially determined as of the current valuation date.

ASSETS

Actuarial Value of Assets	\$	5,218,294,000
Unfunded Actuarial Accrued Liability		1,182,607,000
Present Value of Future Normal Costs	\$	<u>760,969,000</u>
Total Assets	\$	7,161,870,000

LIABILITIES

Present Value of Future Benefits			
Active members			
Retirement	\$	2,271,508,000	
Withdrawal		124,126,000	
Disability		102,869,000	
Death		<u>20,528,000</u>	
Total	\$	2,519,031,000	
Inactive members		151,816,000	
Retirees, disabilities and beneficiaries		<u>4,491,023,000</u>	
Total Liabilities	\$	7,161,870,000	

**SECTION V: SYSTEM LIABILITIES**

TABLE 13**Expected Benefit Payments**

<u>Year End</u>	<u>Current Inactives</u>	<u>Current Actives</u>	<u>Total</u>
2019	\$387,006,000	\$18,226,000	\$405,232,000
2020	388,967,000	30,265,000	419,232,000
2021	390,230,000	44,335,000	434,565,000
2022	390,581,000	59,220,000	449,801,000
2023	390,983,000	73,553,000	464,536,000
2024	390,896,000	88,365,000	479,261,000
2025	390,255,000	102,536,000	492,791,000
2026	389,504,000	117,088,000	506,592,000
2027	387,890,000	132,313,000	520,203,000
2028	386,038,000	148,226,000	534,264,000
2029	383,956,000	164,172,000	548,128,000
2030	380,609,000	179,706,000	560,315,000
2031	376,901,000	195,622,000	572,523,000
2032	372,047,000	211,873,000	583,920,000
2033	367,079,000	228,779,000	595,858,000
2034	360,694,000	245,842,000	606,536,000
2035	354,046,000	261,884,000	615,930,000
2036	346,336,000	277,540,000	623,876,000
2037	338,263,000	292,911,000	631,174,000
2038	329,034,000	307,715,000	636,749,000

Note: Cash flows are the expected future non-discounted payments to current members. These numbers exclude refund payouts to current non-vested inactive members and assume all actuarial assumptions are met in the future, including the retirement assumption.



SECTION V: SYSTEM LIABILITIES

TABLE 14

Schedule of Funding Progress

Valuation as of January 1	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Liability (UAAL)	Funded Ratio	Covered Payroll	UAAL as a Percentage of Covered Payroll
2008	\$ 5,192,000	\$ 3,958,061	\$ 0	131.2%	\$ 532,412	0.0%
2009	4,076,297	4,113,089	36,792	99.1%	536,558	6.9%
2010	4,814,402	4,269,324	0	112.8%	553,846	0.0%
2011	4,641,425	4,447,548	0	104.4%	538,218	0.0%
2012	4,404,635	4,587,915	183,280	96.0%	525,181	34.9%
2013	4,259,889	4,689,814	429,925	90.8%	523,738	82.1%
2014	4,580,729	4,831,689	250,960	94.8%	521,651	48.1%
2015	4,797,437	4,935,482	138,045	97.2%	529,939	26.0%
2016	4,899,155	5,065,141	165,986	96.7%	535,802	31.0%
2017	5,055,700	5,259,300	203,600	96.1%	583,950	34.9%
2018	5,233,486	5,819,762	586,276	89.9%	577,118	101.6%
2019	5,219,184	6,400,901	1,181,717	81.5%	581,663	203.2%

Note: Information prior to 2019 is from the prior actuary.



SECTION VI: SYSTEM CONTRIBUTIONS

An amendment to the Milwaukee City Charter was adopted by the Common Council on April 30, 2013 to establish the Stable Employer Contribution Policy. Under that Policy, an actuarial contribution rate is separately calculated for three groups: Policemen, Fireman, and General Employees of the Combined Fund, and is applicable for the subsequent five-year period. The Policy is designed to:

- (a) Fully fund all current employer normal costs for active members, determined under the current funding method, which is irrespective of the funded status of the System. The result is that the Employer Normal Cost is always funded; and
- (b) Liquidate the unfunded actuarial accrued liability (UAAL), if any, over the amortization period adopted by the Board and based on methodology specified in the MCC. Effective with the January 1, 2019 actuarial valuation, the Board adopted a 25-year closed period to amortize the existing UAAL. At each subsequent valuation date, any changes to the UAAL arising from actual experience that is different than assumed will be amortized over a fixed 15-year period and any changes to the UAAL arising from changes in assumptions will be amortized over a fixed 25-year period.

These rates are established every five years following the Experience Study, based on a study performed by the actuary. The actuary establishes these rates based on the actuarial assumptions adopted by the Annuity and Pension Board of the ERS and the actuarial methods specified in the Charter. The rates are established in conformity with applicable Actuarial Standards of Practice and result in a funded status at the end of the five years that is at least actuarially equivalent to the expected funded status if contributions were based on the redevelopment of the employer contribution rates annually under the same assumptions and methods. The current stable contribution rates apply for calendar years 2018 through 2022.

The actuarially determined employer contribution consists of the employer portion of the normal cost, an allocation for administrative expense and a payment on the unfunded actuarial accrued liability. The employer normal cost is the employer's portion of the cost of benefits for active members, allocated to the current year, after reducing for the member contributions. The unfunded actuarial accrued liability payment is the contribution made in order to pay off the unfunded actuarial accrued liability over the scheduled amortization period.

Amortization methods determine the payment schedule for the unfunded actuarial accrued liability. ERS adopted a 25-year closed amortization period for the amount of unfunded actuarial accrued liability as of January 1, 2019. A new amortization base will be created each year, based on the prior year's experience, and amortized over a closed 15-year period. Changes in the UAAL due to assumption changes, method changes or plan provision changes will be amortized over 25 years.

The exhibits in this Section show the calculation of the actuarially determined employer contribution for the current valuation. As discussed above, although the actuarial contribution rate is determined in the valuation, the actual employer contributions to ERS are derived from the Employer Stable Contribution Policy, set out in the Milwaukee City Charter.



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 15

Normal Cost by Group

Total – All Funds
(Dollars in thousands)

	General Employees	Policemen	Firemen	Total
1. Retirement Benefits	\$21,484	\$34,562	\$11,842	\$67,888
2. Withdrawal Benefits	13,445	2,964	1,171	17,580
3. Disability Benefits	1,355	2,624	4,499	8,478
4. Death Benefits	644	230	113	987
5. Total Normal Cost	\$36,928	\$40,380	\$17,625	\$94,933
6. Projected Payroll	\$360,750	\$159,971	\$60,942	\$581,663
7. Normal Cost Rate	10.24%	25.24%	28.92%	16.32%
8. Member Contribution Rate	4.96%	7.00%	7.00%	5.73%
9. Employer Normal Cost Rate	5.28%	18.24%	21.92%	10.59%



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 16A

Amortization of Unfunded Actuarial Accrued Liability (UAAL)

Combined Fund
(Dollars in thousands)

Amortization Base	Date Established	Original Amount	Outstanding Balance as of January 1, 2019	Remaining Amortization Period	Annual Payment*
2019 UAAL Base	1/1/2019	\$ 1,204,699	\$ 1,204,699	25	\$ 84,320
Total			\$ 1,204,699		\$ 84,320

* Reflects beginning of year timing.



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 16B

Amortization of the Unfunded Actuarial Accrued Liability (UAAL)

Retirement Fund
(Dollars in thousands)

Amortization Base	Date Established	Original Amount	Outstanding Balance as of January 1, 2019	Remaining Amortization Period	Annual Payment*
2019 UAAL Base	1/1/2019	\$ (6,764)	\$ (6,764)	25	\$ (473)
Total			\$ (6,764)		\$ (473)

* Reflects beginning of year timing.



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 16C

Amortization of the Unfunded Actuarial Accrued Liability (UAAL)

General Employees Duty Disability Fund
(Dollars in thousands)

Amortization Base	Date Established	Original Amount	Outstanding Balance as of January 1, 2019	Remaining Amortization Period	Annual Payment*
2019 UAAL Base	1/1/2019	\$ (93)	\$ (93)	25	\$ (7)
Total			\$ (93)		\$ (7)

* Reflects beginning of year timing.



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 16D

Amortization of the Unfunded Actuarial Accrued Liability (UAAL)

Combined Retirement & Disability Fund
(Dollars in thousands)

Amortization Base	Date Established	Original Amount	Outstanding Balance as of January 1, 2019	Remaining Amortization Period	Annual Payment*
2019 UAAL Base	1/1/2019	\$ 1,836	\$ 1,836	25	\$ 129
Total			\$ 1,836		\$ 129

* Reflects beginning of year timing.



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 17

Comparison of Stable Contribution Policy to the Actuarial Determined Rate for Combined Fund
(Dollars in thousands)

	General Employees	Police	Fire	Total
1. Active Members	\$ 8,167	\$ 1,915	\$ 707	\$ 10,789
2. Covered Compensation	\$ 358,300	\$ 159,862	\$ 60,942	\$ 579,104
3. Normal Cost				
a. Total	\$ 36,645	\$ 40,352	\$ 17,625	\$ 94,622
b. Estimated Member Contributions	17,769	11,190	4,266	33,225
c. Employer Normal Cost (a) - (b), not less than zero	\$ 18,876	\$ 29,162	\$ 13,359	\$ 61,397
4. Projected Administrative Expenses	\$ 2,372	\$ 2,369	\$ 1,049	\$ 5,790
5. Active Actuarial Accrued Liability	\$ 716,985	\$ 716,071	\$ 317,008	\$ 1,750,064
6. Assets				
a. Actuarial Value	\$ 223,431	\$ 223,147	\$ 98,788	\$ 545,366
b. Market Value (Net of Inactive Liabilities)	\$ 114,258	\$ 114,113	\$ 50,518	\$ 278,889
7. Unfunded Actuarial Accrued Liability				
a. Actuarial Value	\$ 493,554	\$ 492,924	\$ 218,220	\$ 1,204,698
b. Market Value (5) - (6)	\$ 602,727	\$ 601,958	\$ 266,490	\$ 1,471,175
8. Amortization of UAAL				
a. Actuarial Value	\$ 34,545	\$ 34,501	\$ 15,274	\$ 84,320
b. Market Value	\$ 42,186	\$ 42,133	\$ 18,653	\$ 102,972
9. Annual Contribution Payable January 1, 2019				
a. Actuarial Value	\$ 55,793	\$ 66,032	\$ 29,682	\$ 151,507
b. Market Value (3c) + (4) + (8)	\$ 63,434	\$ 73,664	\$ 33,061	\$ 170,159
10. Employer Rate as of January 1, 2019 based on				
a. Stable Contribution Policy Rate	7.48%	25.22%	26.83%	14.35%
b. Actuarial Determined Rate	15.57%	41.31%	48.71%	26.16%
c. Market-Based Actuarial Determined Rate	17.70%	46.08%	54.25%	29.38%



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 18

Allocation of 2019 Contribution to Agencies for Combined Fund

Group	Active Members	Covered Compensation	Employer Rate**	Dollar Amount Payable***								
				Jan 1, 2019	June 1, 2019	July 1, 2019	Aug 1, 2019	Sept 1, 2019	Oct 1, 2019	Nov 1, 2019	Dec 1, 2019	Jan 31, 2020
General City*	3,303	\$179,514,533	7.48%	\$13,427,687	\$13,838,470	\$13,922,122	\$14,006,280	\$14,090,947	\$14,176,126	\$14,261,820	\$14,348,032	\$14,522,022
Water Department	333	18,379,775	7.48%	1,374,807	1,416,865	1,425,430	1,434,047	1,442,716	1,451,437	1,460,211	1,469,038	1,486,852
School Board****	4,054	125,365,372	7.48%	9,377,330	9,664,203	9,722,622	9,781,394	9,840,522	9,900,007	9,959,852	10,020,058	10,141,565
Milwaukee Technical College	0	0	7.48%	0	0	0	0	0	0	0	0	0
Sewerage Commission	225	19,343,005	7.48%	1,446,857	1,491,120	1,500,134	1,509,202	1,518,325	1,527,503	1,536,737	1,546,026	1,564,774
Veolia	24	1,925,764	7.48%	144,047	148,454	149,351	150,254	151,162	152,076	152,995	153,920	155,786
Wisconsin Center District	81	4,775,345	7.48%	357,196	368,123	370,348	372,587	374,839	377,105	379,385	381,678	386,306
Housing Authority	147	8,996,069	7.48%	672,906	693,492	697,684	701,901	706,144	710,413	714,707	719,027	727,746
Policemen	1,915	159,862,101	25.22%	40,317,222	41,550,615	41,801,785	42,054,473	42,308,689	42,564,442	42,821,741	43,080,595	43,603,007
Firemen	<u>707</u>	<u>60,941,958</u>	26.83%	<u>16,350,727</u>	<u>16,850,932</u>	<u>16,952,795</u>	<u>17,055,273</u>	<u>17,158,371</u>	<u>17,262,092</u>	<u>17,366,440</u>	<u>17,471,419</u>	<u>17,683,284</u>
Total	10,789	\$579,103,922		\$83,468,779	\$86,022,274	\$86,542,271	\$87,065,411	\$87,591,715	\$88,121,201	\$88,653,888	\$89,189,793	\$90,271,342

* Includes Elected Officials and Redevelopment Authority

** Rates apply to Covered Compensation as of the beginning of the year, then credited with interest to payable date.

*** Actual contribution requirement will be adjusted for the actual payment date of the contribution.

**** Breakdown of contributions for MPS by normal cost and past service portion as follow:

Payable at:	Jan 1, 2019	June 1, 2019	July 1, 2019	Aug 1, 2019	Sept 1, 2019	Oct 1, 2019	Nov 1, 2019	Dec 1, 2019	Jan 31, 2020
Normal Cost	6,233,636	6,424,337	6,463,172	6,502,241	6,541,547	6,581,090	6,620,872	6,660,895	6,741,668
Past Service Portion	<u>3,143,694</u>	<u>3,239,866</u>	<u>3,259,450</u>	<u>3,279,153</u>	<u>3,298,975</u>	<u>3,318,917</u>	<u>3,338,980</u>	<u>3,359,163</u>	<u>3,399,897</u>
Total	9,377,330	9,664,203	9,722,622	9,781,394	9,840,522	9,900,007	9,959,852	10,020,058	10,141,565



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 19

Allocation of 2020 Contribution to Agencies for Combined Fund

Group	Estimated Active Members	Estimated Covered Compensation	Employer Rate**	Dollar Amount Payable***								
				Jan 1, 2020	June 1, 2020	July 1, 2020	Aug 1, 2020	Sept 1, 2020	Oct 1, 2020	Nov 1, 2020	Dec 1, 2020	Jan 31, 2021
General City*	3,303	\$183,104,824	7.48%	\$13,696,241	\$14,115,239	\$14,200,564	\$14,286,405	\$14,372,765	\$14,459,647	\$14,547,054	\$14,634,990	\$14,812,459
Water Department	333	18,747,371	7.48%	1,402,303	1,445,203	1,453,939	1,462,728	1,471,570	1,480,466	1,489,415	1,498,418	1,516,588
School Board*****	4,054	127,872,679	7.48%	9,564,876	9,857,487	9,917,075	9,977,023	10,037,333	10,098,008	10,159,050	10,220,461	10,344,398
Milwaukee Technical College	0	0	7.48%	0	0	0	0	0	0	0	0	0
Sewerage Commission	225	19,729,865	7.48%	1,475,794	1,520,942	1,530,136	1,539,386	1,548,691	1,558,053	1,567,471	1,576,946	1,596,069
Veolia	24	1,964,279	7.48%	146,928	151,423	152,338	153,259	154,185	155,117	156,055	156,998	158,902
Wisconsin Center District	81	4,870,852	7.48%	364,340	375,486	377,756	380,040	382,337	384,648	386,973	389,312	394,033
Housing Authority	147	9,175,990	7.48%	686,364	707,361	711,637	715,939	720,267	724,621	729,001	733,408	742,302
Policemen	1,915	163,059,343	25.22%	41,123,566	42,381,627	42,637,821	42,895,563	43,154,863	43,415,731	43,678,176	43,942,207	44,475,067
Firemen	<u>707</u>	<u>62,160,797</u>	26.83%	<u>16,677,742</u>	<u>17,187,951</u>	<u>17,291,851</u>	<u>17,396,379</u>	<u>17,501,539</u>	<u>17,607,334</u>	<u>17,713,769</u>	<u>17,820,847</u>	<u>18,036,949</u>
Total	10,789	\$590,686,000		\$85,138,154	\$87,742,719	\$88,273,117	\$88,806,722	\$89,343,550	\$89,883,625	\$90,426,964	\$90,973,587	\$92,076,767

* Includes Elected Officials and Redevelopment Authority

** Rates apply to Covered Compensation as of the beginning of the year, then credited with interest to payable date.

*** Actual contribution requirement will be adjusted for the actual payment date of the contribution.

**** The amounts shown above are estimates of the employer contribution requirements due by January 31, 2021. The actual employer contribution requirements due by January 31, 2020 will be based on the results of the January 1, 2020 actuarial valuation, which is scheduled to be approved at the June 2020 Board meeting.

To the extent that an employer wishes to contribute before the report is approved, the amounts above can serve as a guide. To the extent that the amount contributed is less than the final contribution requirements, the employer will be billed for the remainder, which is to be paid by the end of the year. To the extent that the amount already contributed is more than the required contribution, the employer will receive a credit, with interest, to the contribution for next year.

***** Breakdown of contributions for MPS by normal cost and past service portion as follow:

Payable at:	Jan 1, 2020	June 1, 2020	July 1, 2020	Aug 1, 2020	Sept 1, 2020	Oct 1, 2020	Nov 1, 2020	Dec 1, 2020	Jan 31, 2021
Normal Cost	6,358,309	6,552,824	6,592,435	6,632,286	6,672,378	6,712,712	6,753,290	6,794,113	6,876,501
Past Service Portion	<u>3,206,567</u>	<u>3,304,663</u>	<u>3,324,640</u>	<u>3,344,737</u>	<u>3,364,955</u>	<u>3,385,296</u>	<u>3,405,760</u>	<u>3,426,348</u>	<u>3,467,897</u>
Total	9,564,876	9,857,487	9,917,075	9,977,023	10,037,333	10,098,008	10,159,050	10,220,461	10,344,398



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 20

Determination of Employer Contribution to Retirement Fund
(Dollars in thousands)

	General			
	Employees	Policemen	Firemen	Total
1. Active Members	19	0	0	19
2. Covered Compensation	\$ 654	\$ 0	\$ 0	\$ 654
3. Normal Cost				
a. Total	\$ 89	\$ 0	\$ 0	\$ 89
b. Estimated Member Contributions	36	0	0	36
c. Employer Normal Cost	\$ 53	\$ 0	\$ 0	\$ 53
(a) - (b), not less than zero				
4. Projected Administrative Expenses	\$ 0	\$ 0	\$ 0	\$ 0
5. Active Actuarial Accrued Liability	\$ 2,588	\$ 0	\$ 0	\$ 2,588
6. Assets				
a. Actuarial Value	\$ 9,352	\$ 0	\$ 0	\$ 9,352
b. Market Value	\$ 8,679	\$ 0	\$ 0	\$ 8,679
(Net of Inactive Liabilities)				
7. Unfunded Actuarial Accrued Liability				
a. Actuarial Value	\$ (6,764)	\$ 0	\$ 0	\$ (6,764)
b. Market Value	\$ (6,091)	\$ 0	\$ 0	\$ (6,091)
(5) - (6)				
8. Amortization of UAAL				
a. Actuarial Value	\$ (473)	\$ 0	\$ 0	\$ (473)
b. Market Value	\$ (426)	\$ 0	\$ 0	\$ (426)
9. Annual Contribution Payable				
January 31, 2020				
a. Actuarial Value	\$ 0	\$ 0	\$ 0	\$ 0
b. Market Value	\$ 0	\$ 0	\$ 0	\$ 0
(3c) + (4) + (8), with interest to 01/31/2020				



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 21

Determination of Employer Contribution to Duty Disability Fund
(Dollars in thousands)

	General			
	Employees	Policemen	Firemen	Total
1. Active Members	19	0	0	19
2. Covered Compensation	\$ 654	\$ 0	\$ 0	\$ 654
3. Normal Cost				
a. Total	\$ 1	\$ 0	\$ 0	\$ 1
b. Estimated Member Contributions	0	0	0	0
c. Employer Normal Cost	\$ 1	\$ 0	\$ 0	\$ 1
(a) - (b), not less than zero				
4. Projected Administrative Expenses	\$ 0	\$ 0	\$ 0	\$ 0
5. Active Actuarial Accrued Liability	\$ 18	\$ 0	\$ 0	\$ 18
6. Actuarial Value of Assets	\$ 111	\$ 0	\$ 0	\$ 111
7. Unfunded Actuarial Accrued Liability (5) - (6)	\$ (93)	\$ 0	\$ 0	\$ (93)
8. Amortization of UAAL	\$ (7)	\$ 0	\$ 0	\$ (7)
9. Annual Contribution Payable January 31, 2020 (3c) + (4) + (8), with interest to 01/31/2020	\$ 0	\$ 0	\$ 0	\$ 0



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 22

Determination of Employer Contribution to Heart and Lung Fund
(Dollars in thousands)

	Amount
1. Active Members	0
2. Covered Compensation	\$ 0
3. Normal Cost	
a. Total	\$ 0
b. Estimated Member Contributions	0
c. Employer Normal Cost	\$ 0
(a) - (b), not less than zero	
4. Projected Administrative Expenses	\$ 0
5. Active Actuarial Accrued Liability	\$ 0
6. Actuarial Value of Assets	\$ 0
7. Unfunded Actuarial Accrued Liability (5) - (6)	\$ 0
8. Full Funding Limit (3) + (4) + (7), not less than zero, with interest to 01/31/2020	\$ 0
9. Annual Contribution Payable January 31, 2020	\$ 0



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 23

Allocation of 2019 Contribution to Agencies for the Retirement, Duty Disability and Heart & Lung Funds

Group	Active Members	Covered Compensation	Fund			January 31, 2020	
			Retirement	Duty Disability	Heart & Lung	Total Due	% of Pay
General City	4	\$193,691	\$0	\$0	\$0	\$0	0.00%
Water Department	0	0	0	0	0	0	0.00%
School Board	15	460,440	0	0	0	0	0.00%
Milwaukee Technical College	0	0	0	0	0	0	0.00%
Sewerage Commission	0	0	0	0	0	0	0.00%
Veolia	0	0	0	0	0	0	0.00%
Wisconsin Center District	0	0	0	0	0	0	0.00%
Housing Authority	0	0	0	0	0	0	0.00%
Policemen	0	0	0	0	0	0	0.00%
Firemen	0	0	0	0	0	0	0.00%
Total	19	\$654,131	\$0	\$0	\$0	\$0	0.00%

Note: Beginning with the January 1, 2019 valuation, Redevelopment Authority members are included in the General City group.



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 24

Determination of Employer Contribution to Combined Retirement and Disability Fund
(Dollars in thousands)

	General Employees	Policemen	Firemen	Total
1. Active Members	42	1	0	43
2. Covered Compensation	\$ 1,796	\$ 109	\$ 0	\$ 1,905
3. Normal Cost				
a. Total	\$ 193	\$ 28	\$ 0	\$ 221
b. Estimated Member Contributions	96	8	0	104
c. Employer Normal Cost (a) - (b), not less than zero	\$ 97	\$ 20	\$ 0	\$ 117
4. Projected Administrative Expenses	\$ 0	\$ 0	\$ 0	\$ 0
5. Active Actuarial Accrued Liability	\$ 4,737	\$ 655	\$ 0	\$ 5,392
6. Assets				
a. Actuarial Value	\$ 3,123	\$ 432	\$ 0	\$ 3,555
b. Market Value (Net of Inactive Liabilities)	\$ 2,897	\$ 401	\$ 0	\$ 3,298
7. Unfunded Actuarial Accrued Liability				
a. Actuarial Value	\$ 1,614	\$ 223	\$ 0	\$ 1,837
b. Market Value (5) - (6)	\$ 1,840	\$ 254	\$ 0	\$ 2,094
8. Amortization of UAAL				
a. Actuarial Value	\$ 113	\$ 16	\$ 0	\$ 129
b. Market Value	\$ 129	\$ 18	\$ 0	\$ 147
8. Annual Contribution Payable January 31, 2020				
a. Actuarial Value	\$ 227	\$ 39	\$ 0	\$ 266
b. Market Value (3c) + (4) + (8), with interest to 01/31/2020	\$ 244	\$ 41	\$ 0	\$ 286



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 25

Allocation of 2019 Contribution to Employee Groups for Combined Retirement and Disability Fund

Group	Active Members	Covered Compensation	Fund		January 31, 2020	
			Combined Retirement & Disability	Heart & Lung	Total Due	% of Pay
General City	15	\$838,053	\$105,913	\$0	\$105,913	12.64%
Water Department	0	0	0	0	0	0.00%
School Board*	23	793,752	100,315	0	100,315	12.64%
Milwaukee Technical College	0	0	0	0	0	0.00%
Sewerage Commission	0	0	0	0	0	0.00%
Veolia	0	0	0	0	0	0.00%
Wisconsin Center District	1	7,478	945	0	945	12.64%
Housing Authority	3	156,885	19,827	0	19,827	12.64%
Policemen	1	109,185	39,000	0	39,000	35.72%
Firemen	0	0	0	0	0	0.00%
Total	43	\$1,905,353	\$266,000	\$0	\$266,000	13.96%

Note: Beginning with the January 1, 2019 valuation, Redevelopment Authority members are included in the General City group.

* Breakdown of contributions for MPS by normal cost and past service portion are as follows:

Payable at:	January 31, 2020
Normal Cost	44,130
Past Service Portion	56,185
Total	100,315



SECTION VI: SYSTEM CONTRIBUTIONS

TABLE 26

Contribution Requirements for FY 2019 by Group and Fund

Amounts shown are calculated as of January 31, 2020. Actual contribution requirements will be adjusted for the actual payment date of the contribution.

Fund	General Employees	Policemen	Firemen	Total
Combined Fund	\$ 28,985,051	\$ 43,603,007	\$ 17,683,284	\$ 90,271,342
Retirement Fund	0	0	0	0
Duty Disability Fund	0	0	0	0
Heart & Lung Fund	N/A	N/A	0	0
Combined Retirement & Disability Fund	227,000	39,000	0	266,000
Total Contribution	\$ 29,212,051	\$ 43,642,007	\$ 17,683,284	\$ 90,537,342
Covered Compensation	\$ 360,750,000	\$ 159,971,000	\$ 60,942,000	\$ 581,663,000
Total Contribution as a Percentage of Covered Compensation	8.10%	27.28%	29.02%	15.57%

Note: reflects the Stable Contribution Policy for the Combined Fund.



SECTION VII: RISK CONSIDERATIONS

Actuarial Standards of Practice are issued by the Actuarial Standards Board and are binding on credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. In September, 2017, Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk in Measuring Pension Obligations*, (ASOP 51) was issued as final with application to measurement dates on or after November 1, 2018. This ASOP, which applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes, is first applicable for the January 1, 2019 actuarial valuation for the Employees' Retirement System of the City of Milwaukee (System).

While actuarial assumptions allow for a projection of how future contributions and investment returns will meet the cash flow needs for future benefit payments, actual experience will not unfold exactly as anticipated by the assumptions. In this section, we discuss some of the risk factors that can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and inflation;
- demographic risks such as mortality, payroll growth, aging population including the impact of baby boomers, and retirement ages;
- contribution risk; and
- external risks such as the regulatory and political environment.

The most significant risk factor is investment return because of the volatility of the returns and the size of plan assets compared to payroll (see Table 27). A perusal of historical rates over 10-20 years reveals that the actual return each year is rarely close to the average return for the same period. This is an expected result given the underlying capital market assumptions and the asset allocation. However, the valuation is a measurement based on a single investment return, usually around the median of the distribution of returns. The magnitude of variations in investment returns and the short timeframe in which they occur makes the management of this risk very challenging.

The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions because of the magnitude of the increase. In the January 1, 2019 valuation, the asset volatility ratio was 8.51. This means a return that is 10% less than assumed (or -2.50%) equates to an actuarial loss of \$495 million or 85% of payroll. Given the asset volatility ratio and the amortization period of 15 years for gains and losses, an increase of 8.28% in the contribution rate over the next 15 years would be required to compensate for an investment return that is 10% below the assumed rate of return.

A key demographic risk for all retirement systems, including CMERS, is improvements in mortality (longevity) greater than anticipated. While the mortality assumption used in the valuation reflects some improvement in mortality experience and this assumption is evaluated and refined in each experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could rapidly improve mortality rates and increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, would also be significant, although more easily absorbed. While either of these events could happen, it represents a small probability and thus represents much less risk than the volatility associated with investment returns.

Finally, the unfunded actuarial accrued liability is amortized as a level percentage of payroll. The



SECTION VII: RISK CONSIDERATIONS

underlying assumption used in developing the payment schedule assumes an increasing payroll over time which is dependent on a stable employment level, i.e., active member count remains the same. When payroll does not grow as expected, the UAAL contribution rate will be higher than expected even if the dollar amount of the payment is the same as scheduled. The assumption for the anticipated increase in covered payroll has been declining and is currently 2.0%. A lower assumed growth in the covered payroll reduces this risk for the System's funding.

As plan demographics change over time, along with the funded status, the risk factors may also change. The following exhibits summarize certain historical information that provide an indication as to how key risk metrics have changed over time.



SECTION VII: RISK CONSIDERATIONS

TABLE 27

Historical Asset Volatility Ratios
(Dollars in thousands)

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan’s contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses by increasing contributions. In the January 1, 2019 valuation, the asset volatility ratio was 8.51. Therefore, underperforming the investment return assumption by 10.00% (i.e., earn -2.50% for one year) is equivalent to \$495 million or 85% of payroll.

ERS is a very mature system as is evident by the fact this is the eighty-first valuation of the System. Therefore, this metric has held fairly stable over this entire period where often the trend is an increasing AVR as the System becomes more mature and its funding improves (assets grow more rapidly than covered payroll).

Actuarial Valuation Date	Market Value of Assets	Covered Payroll	Asset Volatility Ratio	Increase in ADC with a Return 10% Lower than Assumed*
1/1/2010	4,020,640	553,846	7.26	7.06%
1/1/2011	4,322,384	538,218	8.03	7.81%
1/1/2012	4,197,264	525,181	7.99	7.77%
1/1/2013	4,375,197	523,738	8.35	8.13%
1/1/2014	4,949,534	521,651	9.49	9.23%
1/1/2015	4,953,150	529,939	9.35	9.10%
1/1/2016	4,752,308	535,802	8.87	8.63%
1/1/2017	4,886,669	583,950	8.37	8.14%
1/1/2018	5,396,527	577,118	9.35	9.10%
1/1/2019	4,950,881	581,663	8.51	8.28%

* The impact on the Actuarial Determined Contribution (ADC) reflects a 15-year amortization of the actuarial gain/loss and no asset smoothing.



SECTION VII: RISK CONSIDERATIONS

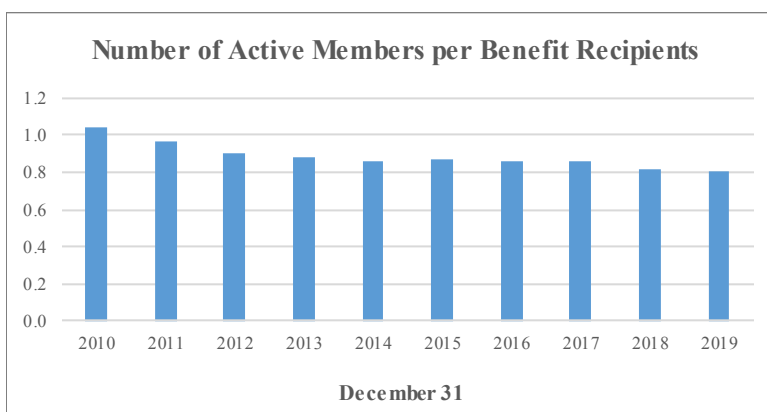
TABLE 28

RATIO OF ACTIVE TO RETIREE COUNT

The payment on the unfunded actuarial accrued liability is calculated anticipating covered payroll increases each year in the future. To the extent actual payroll does not meet the assumed rate of increase (currently 2.0%), a higher rate of pay is necessary to collect the same dollar amount of payment on the unfunded actuarial accrued liability. A reduction in the number of active members usually restricts the growth of covered payroll. ERS has experienced about a 10% decline in the active membership over this period which can create more volatility (risk) on the contributions to fund the System.

Valuation Date January 1	Active Count	In-Pay Count	Active/ In-Pay
2010	11,664	11,178	1.04
2011	11,247	11,542	0.97
2012	10,767	11,937	0.90
2013	10,714	12,109	0.88
2014	10,675	12,468	0.86
2015	10,964	12,580	0.87
2016	10,982	12,746	0.86
2017	11,083	12,872	0.86
2018	10,845	13,181	0.82
2019	10,851	13,355	0.81

Note the ratio of active members to benefit recipients is not critical for ERS as it is for Social Security. The Plan has been funded, in advance, precisely for this reason and those assets exist to help pay the benefits of members. It is, however, a sign of the maturity of the System.





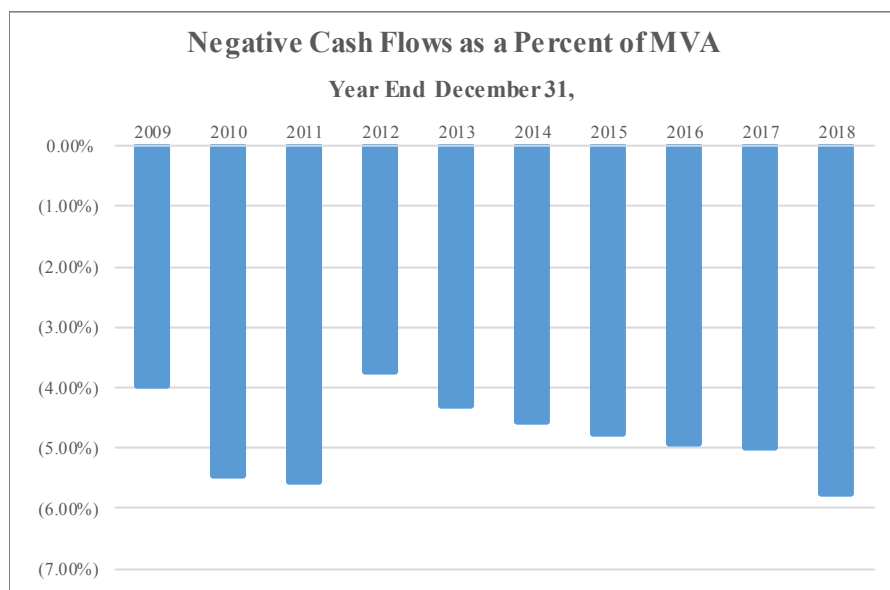
SECTION VII: RISK CONSIDERATIONS

TABLE 29

HISTORICAL CASH FLOWS

Plans with large negative cash flows generally experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions minus benefit payments. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that often follow. Negative cash flows can also impact the System’s asset allocation and is a consideration in setting the investment policy of the system. CMERS has a relatively high negative cash flow so this metric should be closely monitored. The higher the net cash flow is as a percent of the market value of assets, the greater the risk to the System’s funding.

Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
12/31/2009	4,020,640	95,992	255,014	(159,022)	(3.96%)
12/31/2010	4,322,384	35,699	271,710	(236,011)	(5.46%)
12/31/2011	4,197,264	52,675	285,565	(232,890)	(5.55%)
12/31/2012	4,375,197	138,968	302,439	(163,471)	(3.74%)
12/31/2013	4,949,534	122,157	334,858	(212,701)	(4.30%)
12/31/2014	4,953,150	116,507	342,569	(226,062)	(4.56%)
12/31/2015	4,752,308	121,751	347,888	(226,137)	(4.76%)
12/31/2016	4,886,669	110,013	351,303	(241,290)	(4.94%)
12/31/2017	5,396,527	116,018	385,331	(269,313)	(4.99%)
12/31/2018	4,950,881	115,251	400,707	(285,456)	(5.77%)





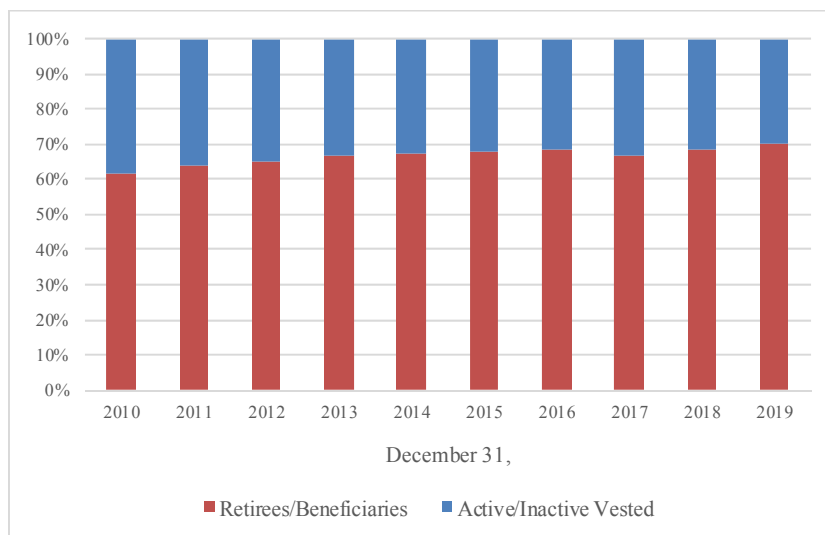
SECTION VII: RISK CONSIDERATIONS

TABLE 30

LIABILITY MATURITY MEASUREMENTS

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread the cost.

Actuarial Valuation Date	Retiree Liability (a)	Total Actuarial Accrued Liability (b)	Retiree Percentage (a / b)
1/1/2010	\$2,637,961	\$4,269,324	61.8%
1/1/2011	2,835,309	4,447,548	63.7%
1/1/2012	2,987,922	4,587,915	65.1%
1/1/2013	3,121,007	4,689,814	66.5%
1/1/2014	3,254,212	4,831,689	67.4%
1/1/2015	3,344,604	4,935,482	67.8%
1/1/2016	3,462,308	5,065,141	68.4%
1/1/2017	3,512,367	5,259,300	66.8%
1/1/2018	3,993,493	5,819,762	68.6%
1/1/2019	4,491,023	6,400,901	70.2%





SECTION VII: RISK CONSIDERATIONS

TABLE 31

Comparison of Valuation Results for the Combined Fund Under Alternate Investment Return Assumptions
(Dollars in thousands)

This exhibit compares the key January 1, 2019 valuation results for the Combined Fund under five (5) different investment return assumptions to illustrate the impact of different assumptions on the funding of the System. Note that only the investment return assumption is changed, as identified in the heading below. All other assumptions are unchanged for purposes of this analysis.

Investment Return Assumption	6.50%	7.00%	7.50%	8.00%	8.50%
Contributions					
Total Normal Cost	\$117,921	\$105,406	\$94,622	\$85,312	\$77,241
Member Contributions	(33,225)	(33,225)	(33,225)	(33,225)	(33,225)
Employer Normal Cost	\$84,696	\$72,181	\$61,397	\$52,087	\$44,016
Projected Administrative Expenses	\$5,790	\$5,790	\$5,790	\$5,790	\$5,790
Unfunded Actuarial Accrued Liability	\$126,172	\$105,145	\$84,320	\$63,674	\$43,191
Total Employer Contribution	\$216,658	\$183,116	\$151,507	\$121,551	\$92,997
Actuarial Determined Employer Rate	37.41%	31.62%	26.16%	20.99%	16.06%
Actuarial Value of Assets (\$ in thousands)	\$5,183,027	\$5,183,027	\$5,183,027	\$5,183,027	\$5,183,027
Actuarial Liability	7,154,335	6,752,962	6,387,726	6,054,593	5,750,111
Unfunded Actuarial Accrued Liability	\$1,971,308	\$1,569,935	\$1,204,699	\$871,566	\$567,084
Funded Ratio	72.4%	76.8%	81.1%	85.6%	90.1%

Note: All other assumptions are unchanged for purposes of this sensitivity analysis.



APPENDIX A: MEMBERSHIP DATA

MEMBER DATA RECONCILIATION

January 1, 2018 to January 1, 2019

The number of members included in the valuation, as summarized in the table below, is in accordance with the data submitted by the System for members of the valuation date.

	Active Members	Inactive Members	Benefit Recipients			Total
			Disabled Members	Retirees	Beneficiaries	
Participants as of January 1, 2018	10,845	3,135	903	10,191	2,102	27,176
New Participants	1,274	926	0	0	156	2,343
Terminations						
- Refunded	(219)	(95)	0	0	0	(314)
- Refund Payable	(376)	376	0	0	0	0
- Deferred Vested	(262)	262	0	0	0	0
Service Retirements	(413)	(186)	0	593	0	0
Disabilities						
- Duty-Related	(4)	0	4	0	0	0
- Non Duty-Related	(8)	(6)	14	0	0	0
Return to Work	33	(33)	0	0	0	0
Deaths	(19)	(19)	(39)	(357)	(146)	(919)
Benefit Payments Stopped	0	0	(1)	0	(56)	(57)
Reached Service Retirement Conversion Age*	0	0	(282)	282	0	0
Participants as of January 1, 2019	10,851	4,360	599	10,715	2,056	28,581

* Beginning with the January 1, 2019 valuation, all duty disabled members who have reached their conversion age are included in the Retirees count.

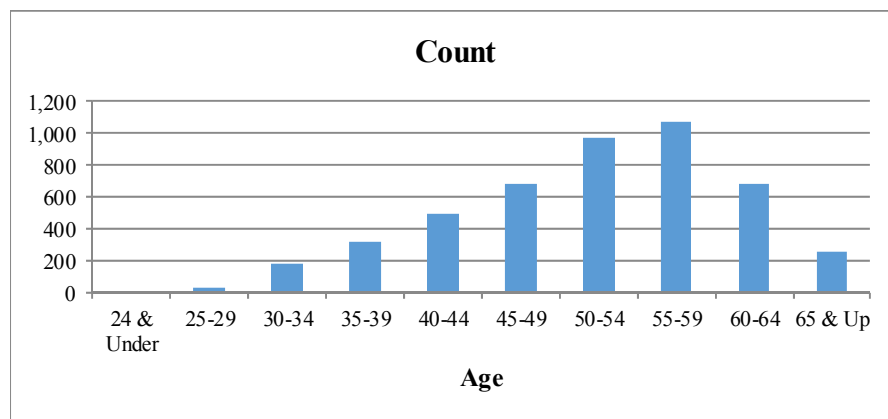
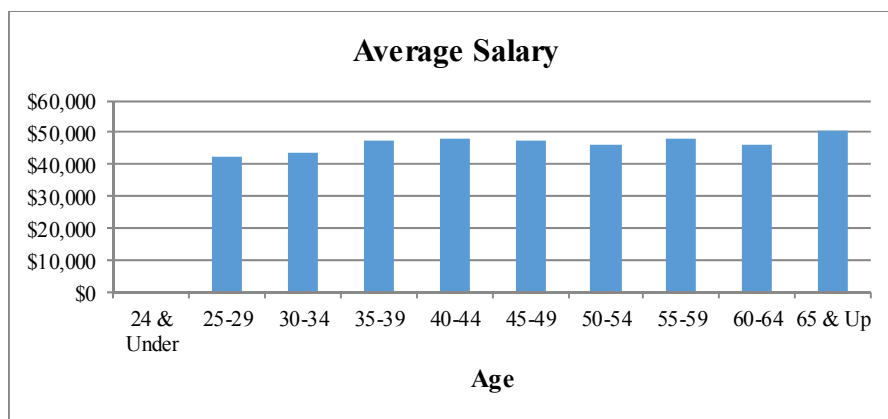


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019**

General Employees – Tier 1

Age	Count			Reported FY 2018 Earnings		
	Male	Female	Total	Male	Female	Total
24 & Under	0	0	0	\$ 0	\$ 0	\$ 0
25-29	16	16	32	739,661	616,710	1,356,371
30-34	87	97	184	4,200,971	3,860,685	8,061,656
35-39	149	168	317	8,049,931	7,093,480	15,143,411
40-44	240	253	493	13,204,267	10,547,199	23,751,466
45-49	316	370	686	18,099,446	14,621,785	32,721,231
50-54	467	504	971	25,422,005	19,379,717	44,801,722
55-59	505	571	1,076	28,946,766	22,579,741	51,526,507
60-64	318	369	687	18,344,463	13,601,845	31,946,308
65 & Up	<u>119</u>	<u>132</u>	<u>251</u>	<u>7,336,631</u>	<u>5,357,732</u>	<u>12,694,363</u>
Total	2,217	2,480	4,697	\$ 124,344,141	\$ 97,658,894	\$ 222,003,035



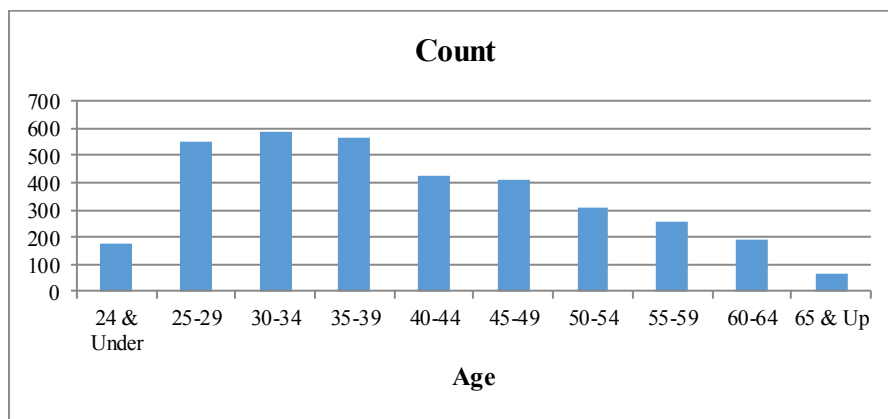
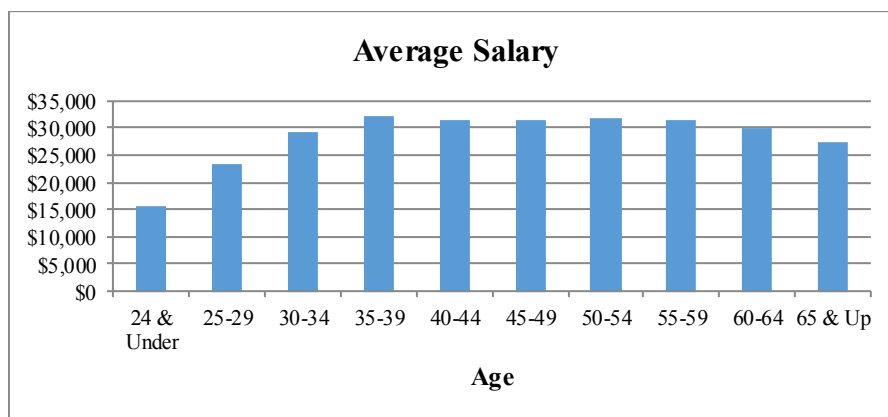


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019**

General Employees – Tier 2

Age	Count			Reported FY 2018 Earnings		
	Male	Female	Total	Male	Female	Total
24 & Under	67	105	172	\$ 1,181,651	\$ 1,494,003	\$ 2,675,654
25-29	203	349	552	5,706,990	7,244,363	12,951,353
30-34	216	367	583	7,728,384	9,369,771	17,098,155
35-39	234	330	564	9,188,832	8,959,441	18,148,273
40-44	164	264	428	6,445,383	6,903,953	13,349,336
45-49	180	231	411	6,781,318	6,074,156	12,855,474
50-54	144	165	309	5,545,645	4,247,722	9,793,367
55-59	126	131	257	4,872,557	3,192,467	8,065,024
60-64	86	101	187	3,355,177	2,232,786	5,587,963
65 & Up	<u>36</u>	<u>32</u>	<u>68</u>	<u>1,130,737</u>	<u>718,376</u>	<u>1,849,113</u>
Total	1,456	2,075	3,531	\$ 51,936,674	\$ 50,437,038	\$ 102,373,712



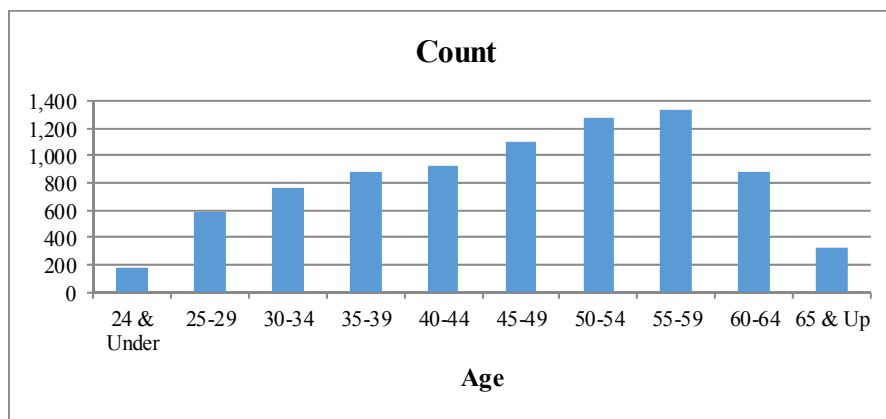
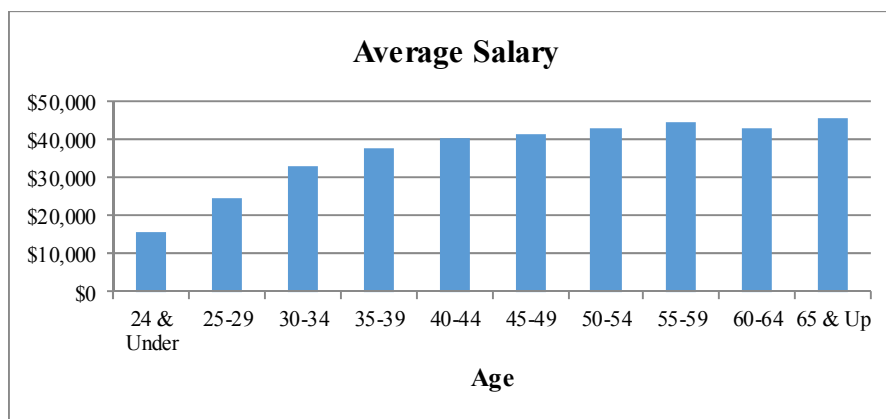


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019**

General Employees – Total

Age	Count			Reported FY 2018 Earnings		
	Male	Female	Total	Male	Female	Total
24 & Under	67	105	172	\$ 1,181,651	\$ 1,494,003	\$ 2,675,654
25-29	219	365	584	6,446,651	7,861,073	14,307,724
30-34	303	464	767	11,929,355	13,230,456	25,159,811
35-39	383	498	881	17,238,763	16,052,921	33,291,684
40-44	404	517	921	19,649,650	17,451,152	37,100,802
45-49	496	601	1,097	24,880,764	20,695,941	45,576,705
50-54	611	669	1,280	30,967,650	23,627,439	54,595,089
55-59	631	702	1,333	33,819,323	25,772,208	59,591,531
60-64	404	470	874	21,699,640	15,834,631	37,534,271
65 & Up	<u>155</u>	<u>164</u>	<u>319</u>	<u>8,467,368</u>	<u>6,076,108</u>	<u>14,543,476</u>
Total	3,673	4,555	8,228	\$ 176,280,815	\$ 148,095,932	\$ 324,376,747



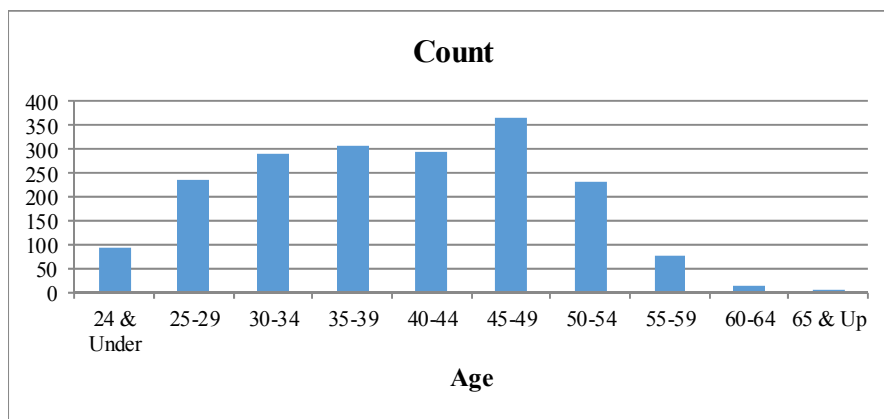
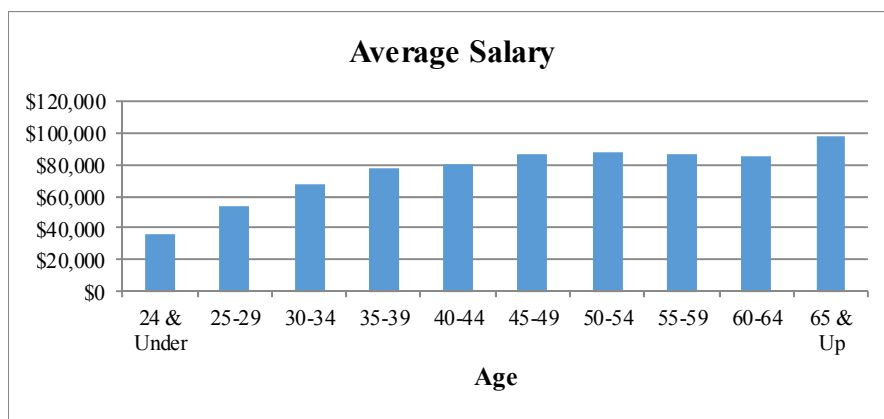


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019**

Policemen

Age	Count			Reported FY 2018 Earnings		
	Male	Female	Total	Male	Female	Total
24 & Under	74	18	92	\$ 2,741,789	\$ 625,153	\$ 3,366,942
25-29	200	35	235	10,918,837	1,799,875	12,718,712
30-34	250	42	292	16,995,389	2,880,962	19,876,351
35-39	253	56	309	19,681,503	4,126,341	23,807,844
40-44	249	46	295	19,937,122	3,857,097	23,794,219
45-49	304	62	366	26,206,283	5,456,812	31,663,095
50-54	191	41	232	16,745,557	3,674,861	20,420,418
55-59	64	11	75	5,485,356	955,745	6,441,101
60-64	14	2	16	1,191,026	163,402	1,354,428
65 & Up	4	0	4	389,335	0	389,335
Total	1,603	313	1,916	\$ 120,292,197	\$ 23,540,248	\$ 143,832,445



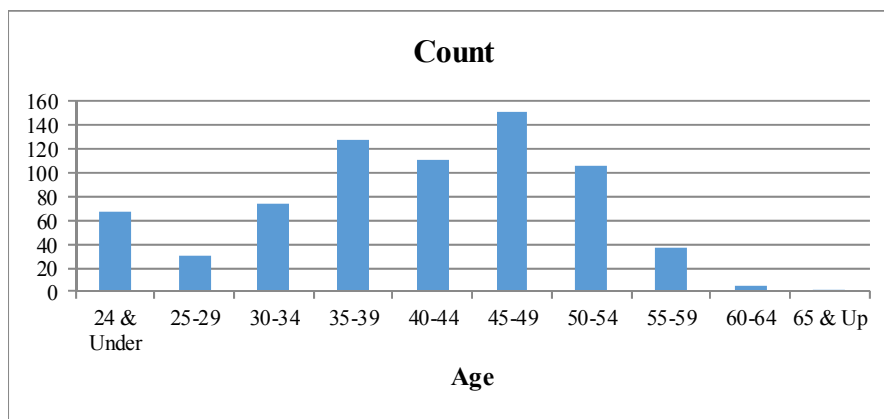
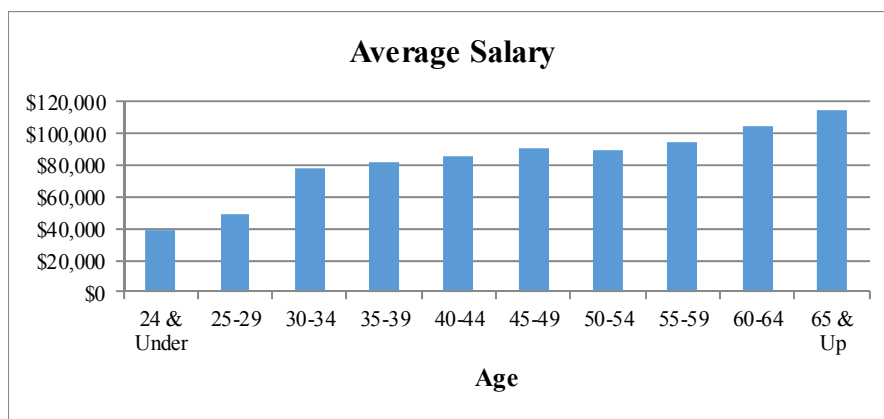


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF ACTIVE MEMBERS
as of January 1, 2019**

Firemen

Age	Count			Reported FY 2018 Earnings		
	Male	Female	Total	Male	Female	Total
24 & Under	58	9	67	\$ 2,265,919	\$ 339,517	\$ 2,605,436
25-29	29	1	30	1,423,607	58,418	1,482,025
30-34	69	4	73	5,455,133	261,012	5,716,145
35-39	125	3	128	10,251,814	181,919	10,433,733
40-44	108	3	111	9,183,845	242,363	9,426,208
45-49	147	3	150	13,234,016	306,600	13,540,616
50-54	102	3	105	9,148,583	255,428	9,404,011
55-59	37	0	37	3,480,172	0	3,480,172
60-64	5	0	5	523,682	0	523,682
65 & Up	<u>1</u>	<u>0</u>	<u>1</u>	<u>114,055</u>	<u>0</u>	<u>114,055</u>
Total	681	26	707	\$ 55,080,826	\$ 1,645,257	\$ 56,726,083





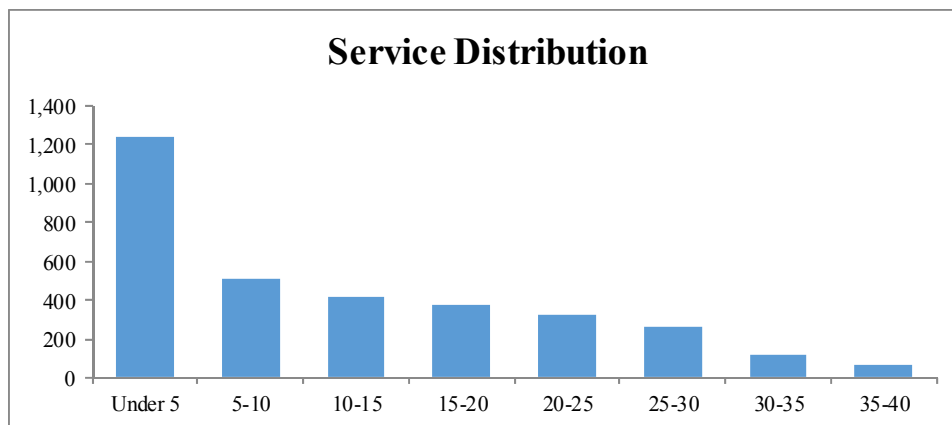
APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

General City*

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	42	0	0	0	0	0	0	0	42
25-29	155	15	0	0	0	0	0	0	170
30-34	205	81	16	0	0	0	0	0	302
35-39	224	83	62	19	2	0	0	0	390
40-44	169	76	70	62	20	1	0	0	398
45-49	167	80	71	90	69	21	1	0	499
50-54	108	65	62	92	94	67	24	4	516
55-59	95	56	55	63	93	118	48	20	548
60-64	54	38	50	36	37	47	39	27	328
65 & Up	16	18	26	16	12	12	11	18	129
Total	1,235	512	412	378	327	266	123	69	3,322

* Includes Elected Officials, General Employees of the City of Milwaukee, and Redevelopment Authority



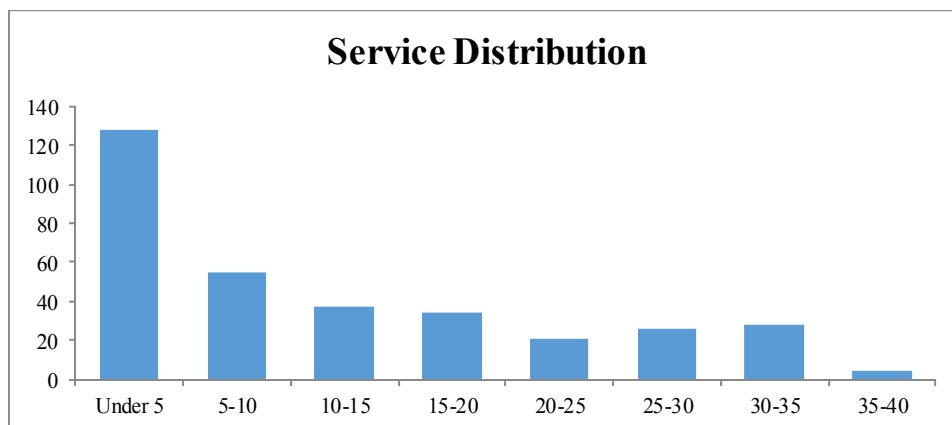


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Water Department

<u>Age</u>	<u>Service</u>								<u>Total</u>
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	6	0	0	0	0	0	0	0	6
25-29	13	2	0	0	0	0	0	0	15
30-34	25	5	0	0	0	0	0	0	30
35-39	25	6	6	1	0	0	0	0	38
40-44	18	10	7	9	2	0	0	0	46
45-49	16	7	8	6	1	1	0	0	39
50-54	11	14	8	10	7	7	5	0	62
55-59	10	9	7	5	6	10	17	1	65
60-64	2	1	1	2	3	8	5	1	23
65 & Up	2	1	0	1	2	0	1	2	9
Total	128	55	37	34	21	26	28	4	333



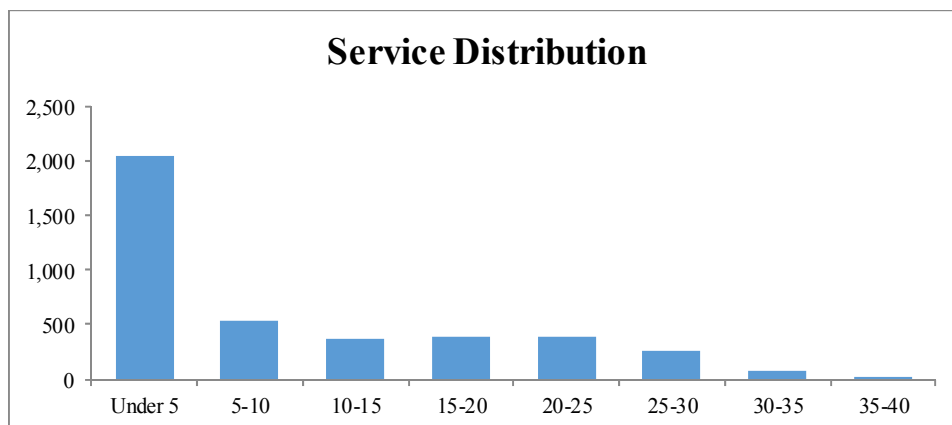


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

School Board

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	123	0	0	0	0	0	0	0	123
25-29	365	9	0	0	0	0	0	0	374
30-34	334	54	5	0	0	0	0	0	393
35-39	294	69	36	10	0	0	0	0	409
40-44	226	76	65	31	17	0	0	0	415
45-49	215	90	65	69	55	12	1	0	507
50-54	173	90	79	92	102	78	18	0	632
55-59	145	77	57	91	126	101	28	8	633
60-64	126	50	41	68	89	58	23	9	464
65 & Up	47	15	18	30	7	15	6	4	142
Total	2,048	530	366	391	396	264	76	21	4,092



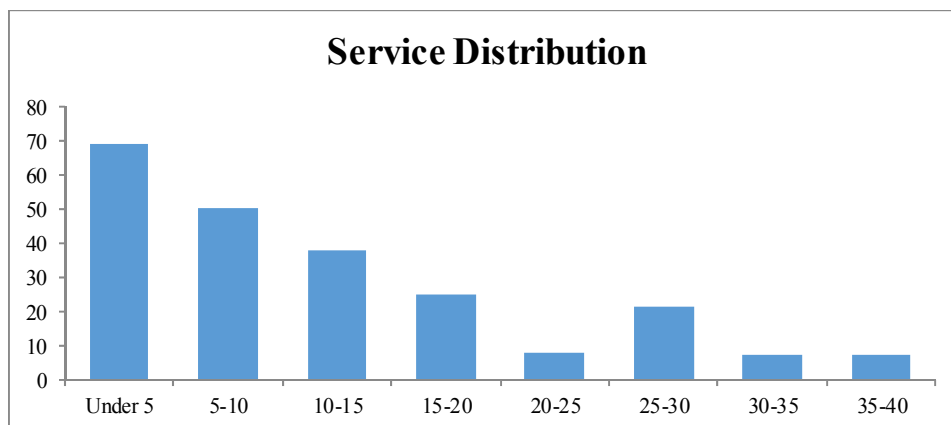


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Sewerage Commission

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	0	0	0	0	0	0	0	0	0
25-29	12	3	0	0	0	0	0	0	15
30-34	14	10	0	0	0	0	0	0	24
35-39	13	11	4	0	0	0	0	0	28
40-44	7	14	10	3	0	0	0	0	34
45-49	7	4	8	1	0	1	0	0	21
50-54	5	2	4	7	2	7	1	0	28
55-59	5	1	6	5	4	10	3	1	35
60-64	4	2	2	5	1	3	2	2	21
65 & Up	2	3	4	4	1	0	1	4	19
Total	69	50	38	25	8	21	7	7	225



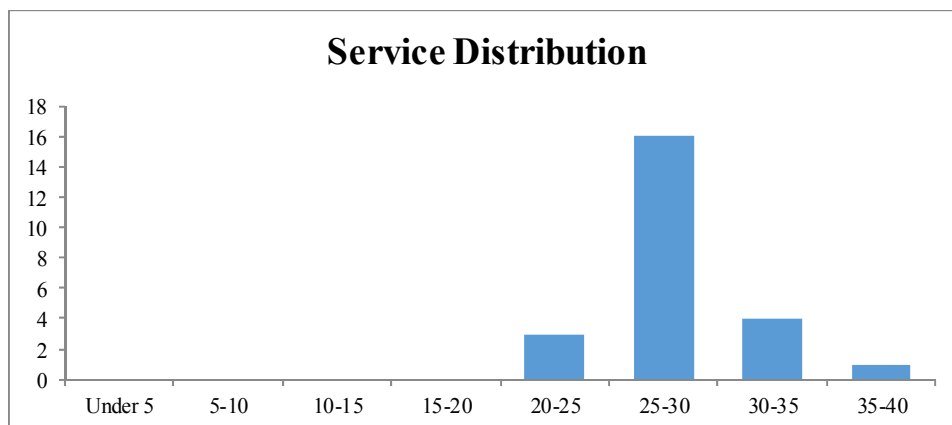


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Veolia

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0
50-54	0	0	0	0	2	1	0	0	3
55-59	0	0	0	0	0	6	2	0	8
60-64	0	0	0	0	1	7	2	1	11
65 & Up	0	0	0	0	0	2	0	0	2
Total	0	0	0	0	3	16	4	1	24



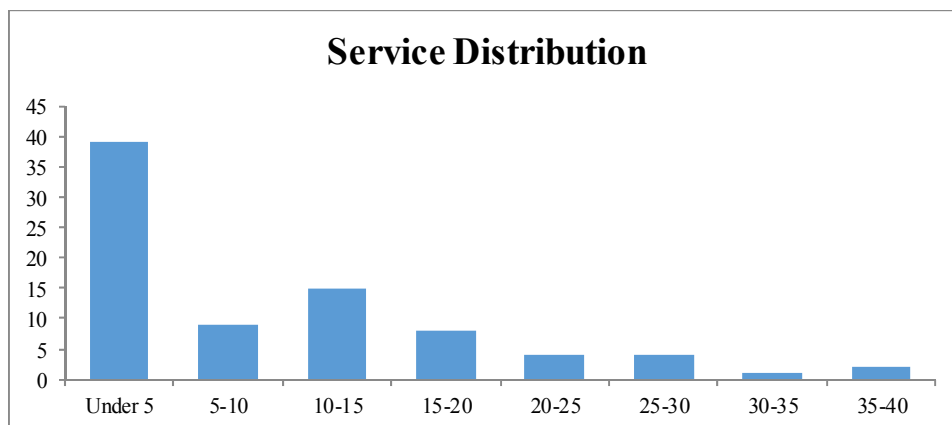


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Wisconsin District Center

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	1	0	0	0	0	0	0	0	1
25-29	3	1	0	0	0	0	0	0	4
30-34	6	1	0	0	0	0	0	0	7
35-39	3	1	2	0	0	0	0	0	6
40-44	5	2	3	2	0	0	0	0	12
45-49	6	2	1	1	2	0	0	0	12
50-54	6	0	3	0	1	2	0	0	12
55-59	4	1	2	2	1	1	0	1	12
60-64	3	1	1	1	0	1	1	0	8
65 & Up	2	0	3	2	0	0	0	1	8
Total	39	9	15	8	4	4	1	2	82



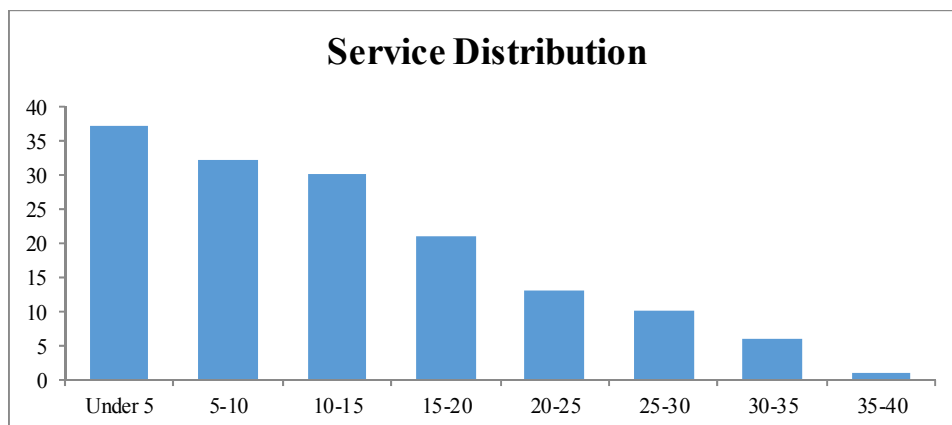


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Housing Authority

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	0	0	0	0	0	0	0	0	0
25-29	4	2	0	0	0	0	0	0	6
30-34	6	4	1	0	0	0	0	0	11
35-39	7	2	1	0	0	0	0	0	10
40-44	7	3	4	2	0	0	0	0	16
45-49	4	5	4	5	0	1	0	0	19
50-54	4	5	6	2	7	1	2	0	27
55-59	3	4	5	9	5	4	2	0	32
60-64	1	7	4	1	0	3	2	1	19
65 & Up	1	0	5	2	1	1	0	0	10
Total	37	32	30	21	13	10	6	1	150



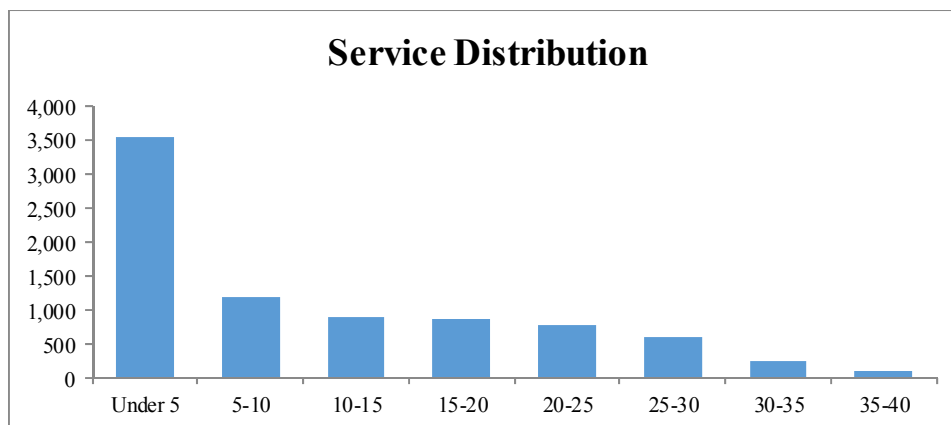


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

General Employees – Total

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	172	0	0	0	0	0	0	0	172
25-29	552	32	0	0	0	0	0	0	584
30-34	590	155	22	0	0	0	0	0	767
35-39	566	172	111	30	2	0	0	0	881
40-44	432	181	159	109	39	1	0	0	921
45-49	415	188	157	172	127	36	2	0	1,097
50-54	307	176	162	203	215	163	50	4	1,280
55-59	262	148	132	175	235	250	100	31	1,333
60-64	190	99	99	113	131	127	74	41	874
65 & Up	70	37	56	55	23	30	19	29	319
Total	3,556	1,188	898	857	772	607	245	105	8,228



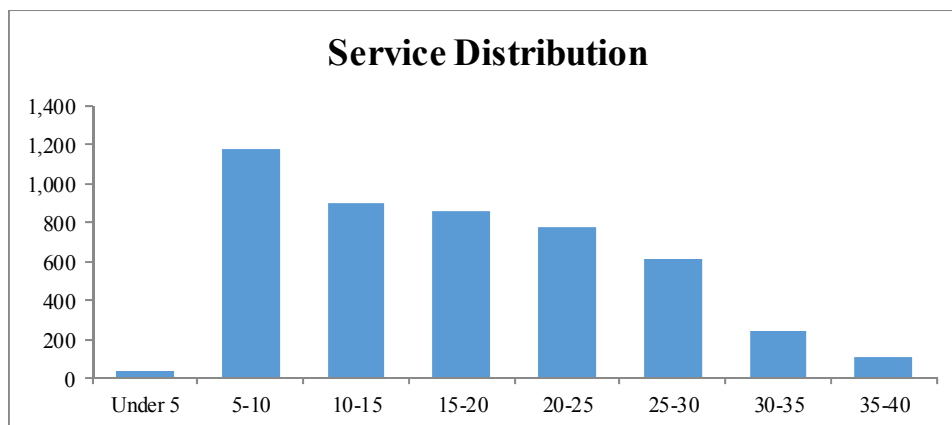


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

General Employees – Tier 1

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	0	0	0	0	0	0	0	0	0
25-29	1	31	0	0	0	0	0	0	32
30-34	8	154	22	0	0	0	0	0	184
35-39	3	171	111	30	2	0	0	0	317
40-44	6	179	159	109	39	1	0	0	493
45-49	9	183	157	172	127	36	2	0	686
50-54	0	174	162	203	215	163	50	4	971
55-59	5	148	132	175	235	250	100	31	1,076
60-64	4	98	99	113	131	127	74	41	687
65 & Up	2	37	56	55	23	30	19	29	251
Total	38	1,175	898	857	772	607	245	105	4,697



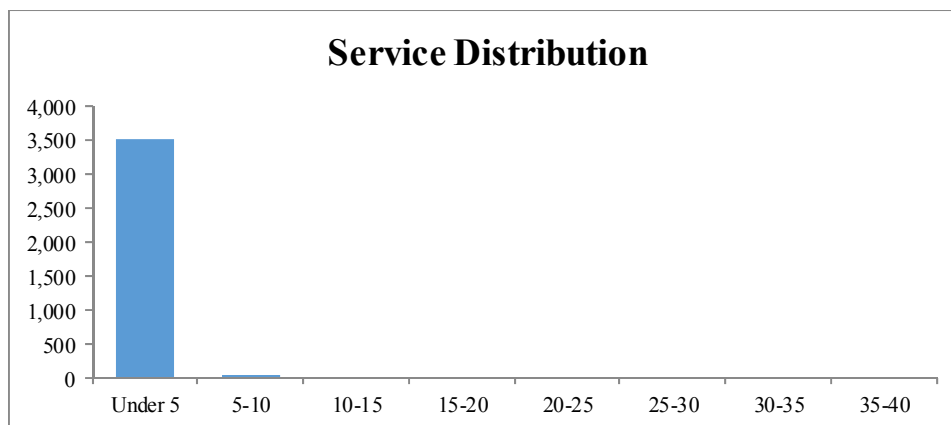


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

General Employees – Tier 2

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	172	0	0	0	0	0	0	0	172
25-29	551	1	0	0	0	0	0	0	552
30-34	582	1	0	0	0	0	0	0	583
35-39	563	1	0	0	0	0	0	0	564
40-44	426	2	0	0	0	0	0	0	428
45-49	406	5	0	0	0	0	0	0	411
50-54	307	2	0	0	0	0	0	0	309
55-59	257	0	0	0	0	0	0	0	257
60-64	186	1	0	0	0	0	0	0	187
65 & Up	68	0	0	0	0	0	0	0	68
Total	3,518	13	0	0	0	0	0	0	3,531



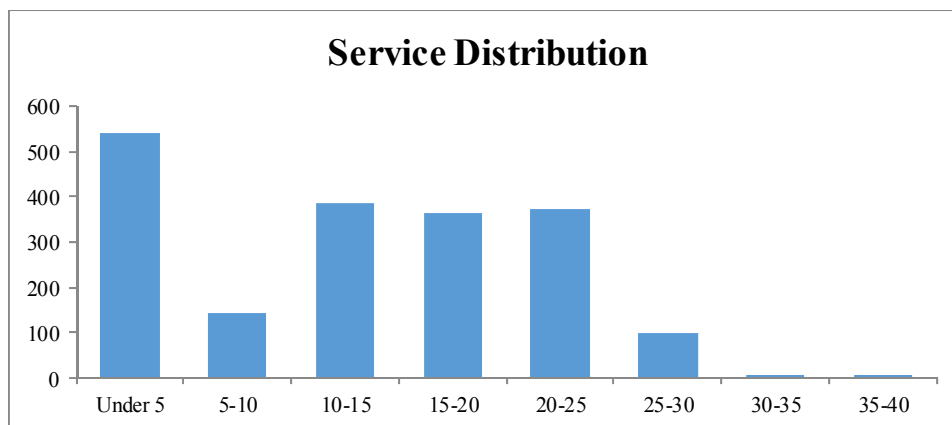


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Policemen

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	92	0	0	0	0	0	0	0	92
25-29	189	39	7	0	0	0	0	0	235
30-34	147	55	77	13	0	0	0	0	292
35-39	68	34	136	62	9	0	0	0	309
40-44	29	12	97	107	46	4	0	0	295
45-49	11	4	46	103	173	28	1	0	366
50-54	1	0	16	52	115	47	0	1	232
55-59	3	0	5	23	24	15	5	0	75
60-64	0	0	3	4	4	4	0	1	16
65 & Up	0	0	0	0	1	1	1	1	4
Total	540	144	387	364	372	99	7	3	1,916



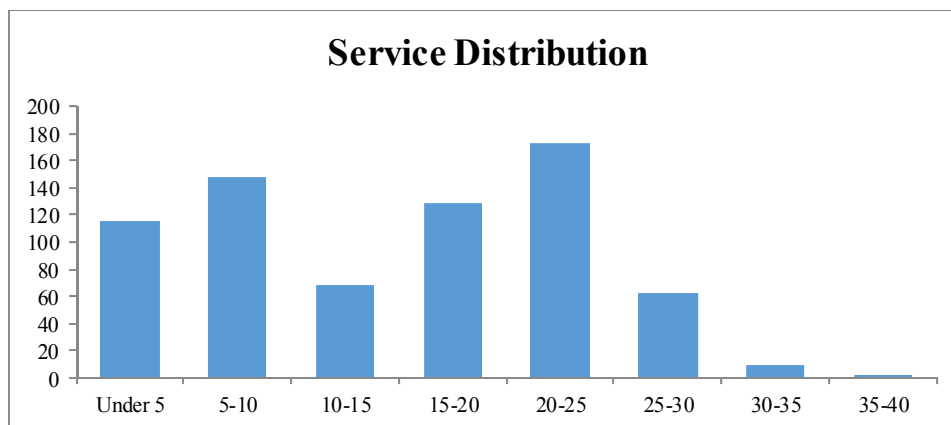


APPENDIX A: MEMBERSHIP DATA

**DISTRIBUTION OF ACTIVE MEMBERS
as of January 1, 2019**

Firemen

Age	Service								Total
	Under 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	
24 & Under	67	0	0	0	0	0	0	0	67
25-29	30	0	0	0	0	0	0	0	30
30-34	5	39	28	1	0	0	0	0	73
35-39	8	62	10	36	12	0	0	0	128
40-44	5	28	17	28	32	1	0	0	111
45-49	0	14	6	37	76	17	0	0	150
50-54	0	3	7	18	47	29	0	1	105
55-59	0	0	0	8	5	16	8	0	37
60-64	0	1	0	1	1	0	2	0	5
65 & Up	0	0	0	0	0	0	0	1	1
Total	115	147	68	129	173	63	10	2	707



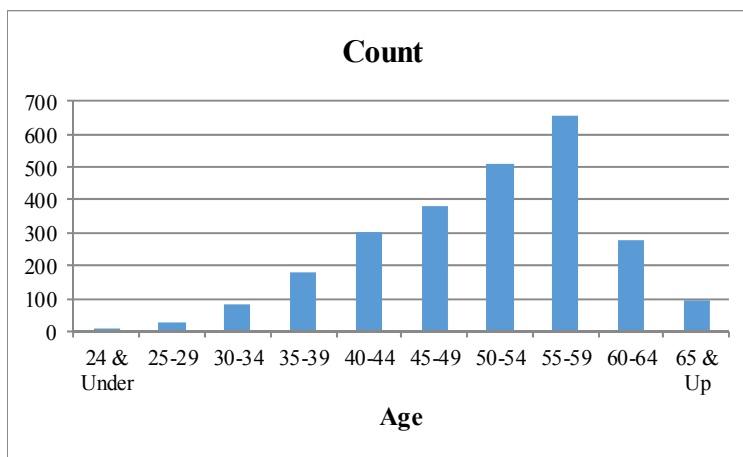
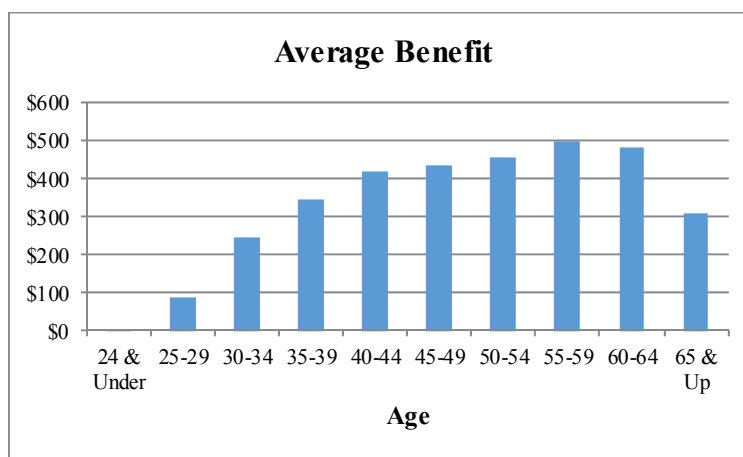


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF INACTIVE VESTED MEMBERS
as of January 1, 2019**

General Employees

Age	Count			Estimated Monthly Benefits		
	Male	Female	Total	Male	Female	Total
24 & Under	0	1	1	\$ 0	\$ 4	\$ 4
25-29	8	18	26	240	2,079	2,319
30-34	29	55	84	6,888	13,623	20,511
35-39	66	115	181	29,668	32,399	62,067
40-44	113	189	302	48,250	78,271	126,521
45-49	156	223	379	73,235	91,727	164,962
50-54	203	306	509	114,978	116,525	231,503
55-59	244	410	654	143,184	181,897	325,081
60-64	101	175	276	61,432	70,511	131,943
65 & Up	<u>43</u>	<u>49</u>	<u>92</u>	<u>16,560</u>	<u>11,439</u>	<u>27,999</u>
Total	963	1,541	2,504	\$ 494,435	\$ 598,475	\$ 1,092,910



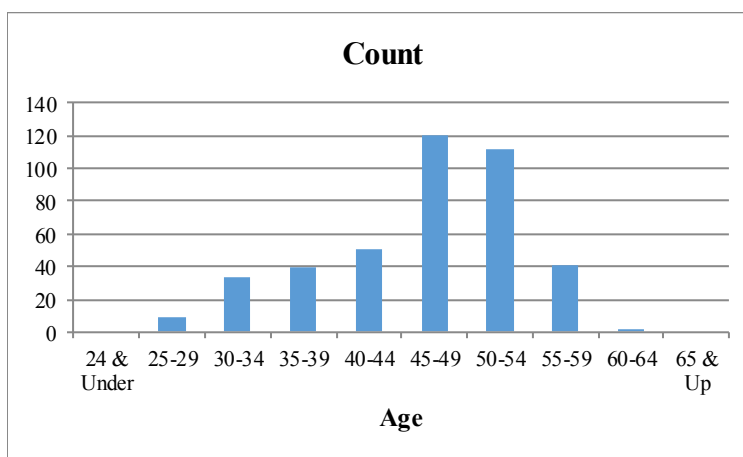
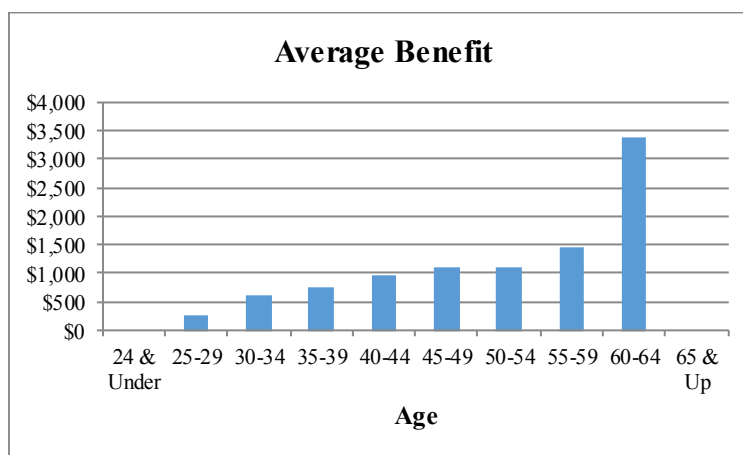


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF INACTIVE VESTED MEMBERS
as of January 1, 2019**

Policemen

Age	Count			Estimated Monthly Benefits		
	Male	Female	Total	Male	Female	Total
24 & Under	0	0	0	\$ 0	\$ 0	\$ 0
25-29	7	2	9	1,456	1,068	2,524
30-34	23	10	33	12,643	7,508	20,151
35-39	27	13	40	19,867	9,629	29,496
40-44	38	13	51	38,862	10,238	49,100
45-49	88	32	120	108,102	24,406	132,508
50-54	85	27	112	87,100	36,088	123,188
55-59	33	8	41	49,388	9,614	59,002
60-64	1	0	1	3,378	0	3,378
65 & Up	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	302	105	407	\$ 320,796	\$ 98,551	\$ 419,347



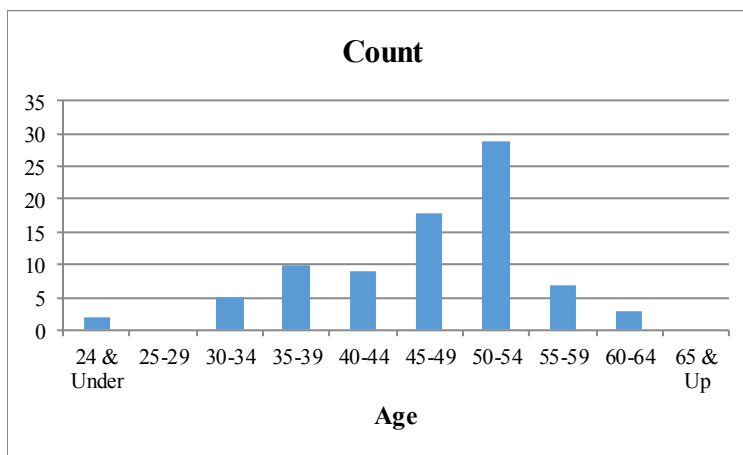
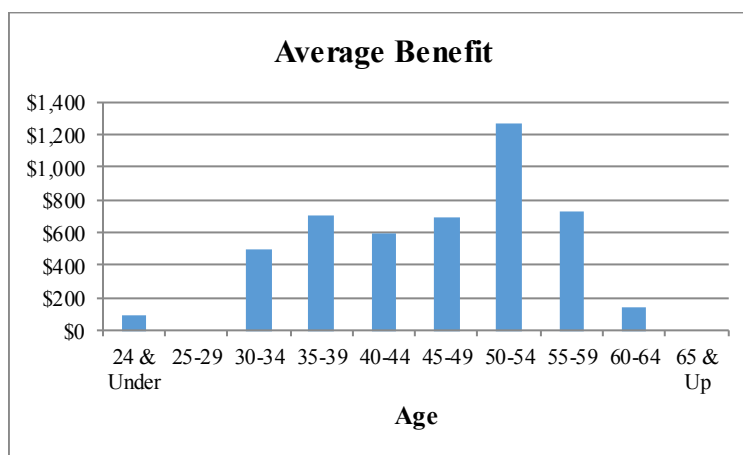


APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF INACTIVE VESTED MEMBERS
as of January 1, 2019**

Firemen

Age	Count			Estimated Monthly Benefits		
	Male	Female	Total	Male	Female	Total
24 & Under	2	0	2	\$ 174	\$ 0	\$ 174
25-29	0	0	0	0	0	0
30-34	5	0	5	2,492	0	2,492
35-39	10	0	10	7,095	0	7,095
40-44	9	0	9	5,383	0	5,383
45-49	16	2	18	12,474	31	12,505
50-54	28	1	29	35,273	1,479	36,752
55-59	7	0	7	5,083	0	5,083
60-64	3	0	3	441	0	441
65 & Up	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	80	3	83	\$ 68,415	\$ 1,510	\$ 69,925





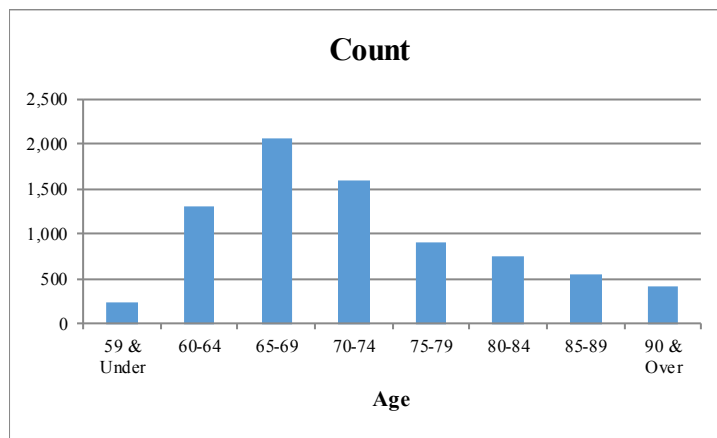
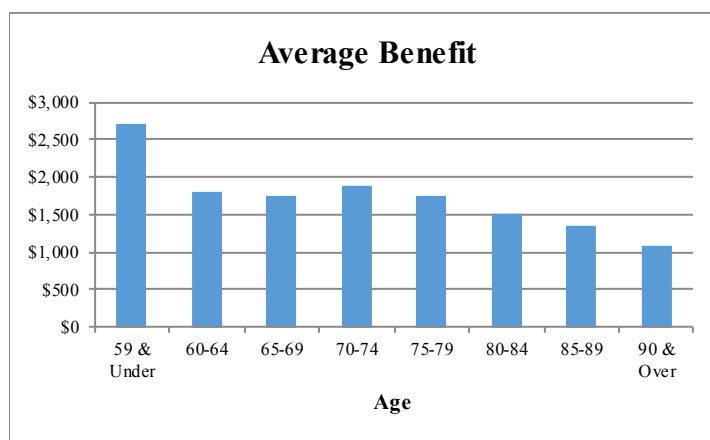
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF RETIRED MEMBERS
as of January 1, 2019**

General Employees

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	112	138	250	\$ 320,133	\$ 359,291	\$ 679,424
60-64	641	675	1,316	1,436,938	919,214	2,356,152
65-69	993	1,058	2,051	2,147,213	1,446,843	3,594,056
70-74	863	724	1,587	2,064,542	931,295	2,995,837
75-79	416	481	897	1,009,670	567,737	1,577,407
80-84	340	411	751	770,435	372,064	1,142,499
85-89	234	319	553	510,696	234,231	744,927
90 & Over	<u>163</u>	<u>254</u>	<u>417</u>	<u>299,366</u>	<u>154,393</u>	<u>453,759</u>
Total	3,762	4,060	7,822	\$ 8,558,993	\$ 4,985,068	\$ 13,544,061

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





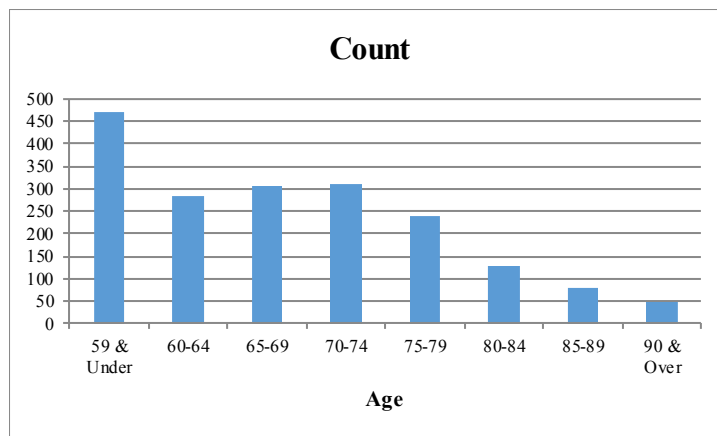
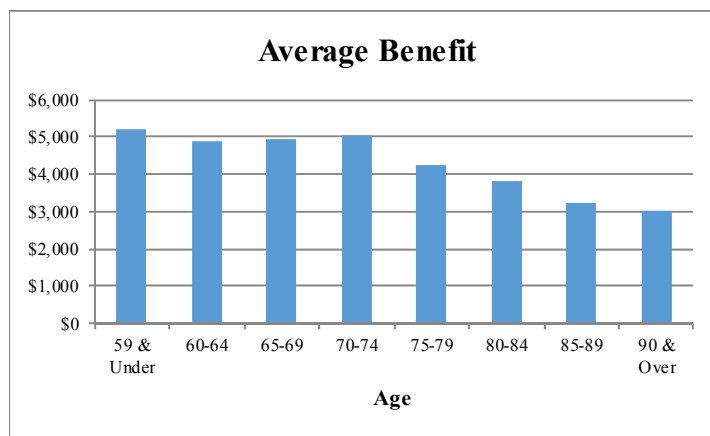
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF RETIRED MEMBERS
as of January 1, 2019**

Policemen

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	381	88	469	\$ 1,983,162	\$ 461,563	\$ 2,444,725
60-64	239	45	284	1,181,286	210,343	1,391,629
65-69	271	35	306	1,341,864	171,170	1,513,034
70-74	296	15	311	1,516,806	59,732	1,576,538
75-79	239	0	239	1,010,685	0	1,010,685
80-84	128	2	130	486,180	7,317	493,497
85-89	80	1	81	260,540	1,390	261,930
90 & Over	<u>45</u>	<u>2</u>	<u>47</u>	<u>137,415</u>	<u>4,683</u>	<u>142,098</u>
Total	1,679	188	1,867	\$ 7,917,938	\$ 916,198	\$ 8,834,136

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





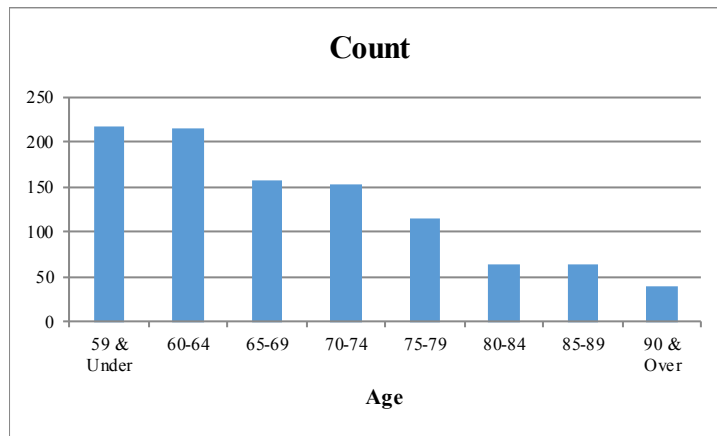
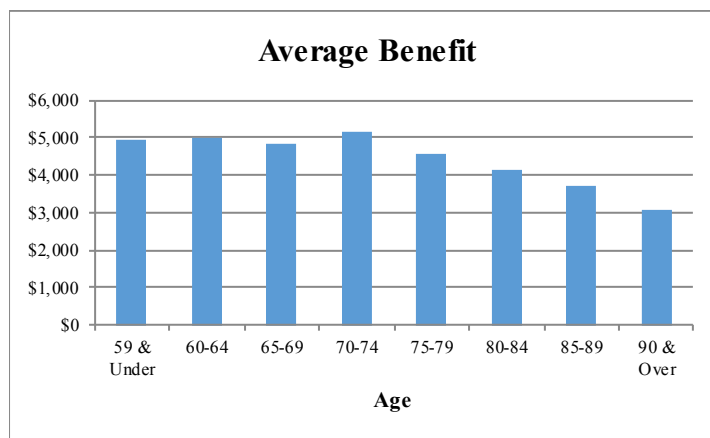
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF RETIRED MEMBERS
as of January 1, 2019**

Firemen

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	194	24	218	\$ 961,399	\$ 119,650	\$ 1,081,049
60-64	204	12	216	1,028,400	47,471	1,075,871
65-69	152	5	157	740,971	17,357	758,328
70-74	152	1	153	781,652	4,665	786,317
75-79	115	0	115	525,054	0	525,054
80-84	64	0	64	264,811	0	264,811
85-89	62	1	63	229,646	3,848	233,494
90 & Over	<u>40</u>	<u>0</u>	<u>40</u>	<u>122,484</u>	<u>0</u>	<u>122,484</u>
Total	983	43	1,026	\$ 4,654,417	\$ 192,991	\$ 4,847,408

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





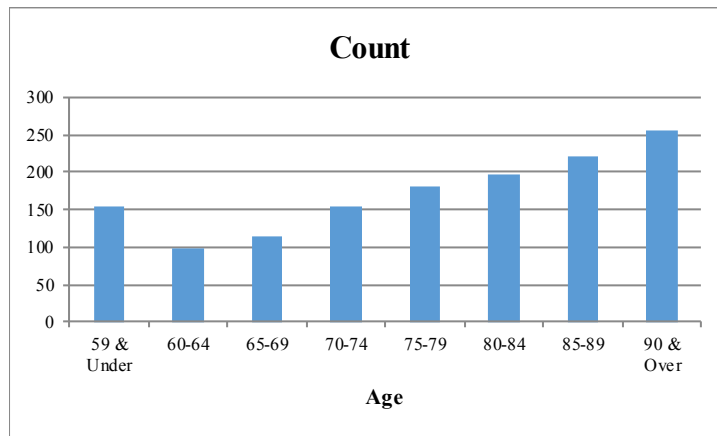
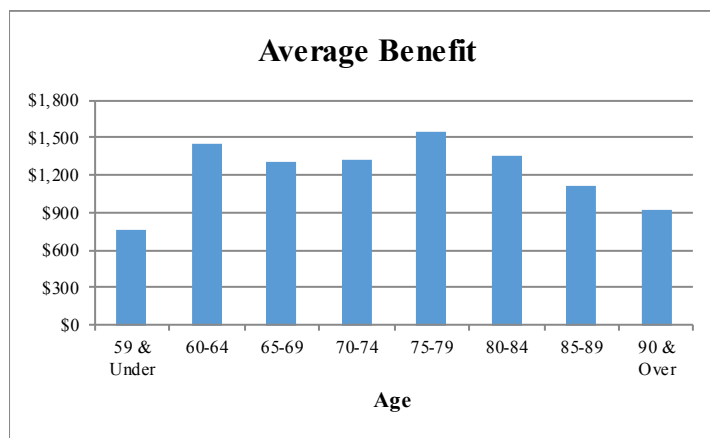
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF BENEFICIARIES
as of January 1, 2019**

General Employees

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	58	96	154	\$ 29,976	\$ 88,501	\$ 118,477
60-64	19	78	97	21,109	119,132	140,241
65-69	24	90	114	22,017	127,322	149,339
70-74	28	126	154	26,023	176,826	202,849
75-79	11	169	180	7,190	271,059	278,249
80-84	20	178	198	13,107	254,051	267,158
85-89	29	191	220	12,953	231,369	244,322
90 & Over	<u>29</u>	<u>226</u>	<u>255</u>	<u>14,061</u>	<u>220,443</u>	<u>234,504</u>
Total	218	1,154	1,372	\$ 146,436	\$ 1,488,703	\$ 1,635,139

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





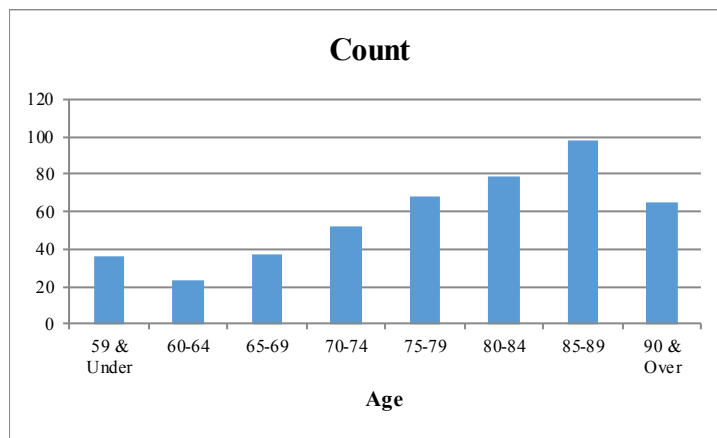
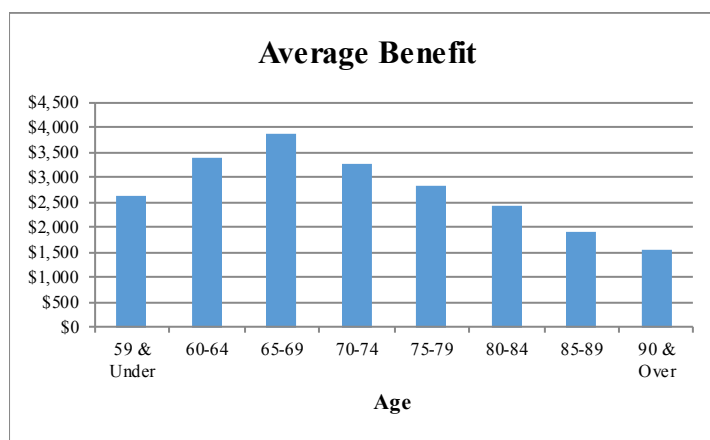
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF BENEFICIARIES
as of January 1, 2019**

Policemen

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	5	31	36	\$ 6,054	\$ 88,785	\$ 94,839
60-64	3	20	23	5,747	71,750	77,497
65-69	2	35	37	5,308	137,475	142,783
70-74	1	51	52	1,693	168,596	170,289
75-79	0	68	68	0	191,469	191,469
80-84	0	79	79	0	193,023	193,023
85-89	0	98	98	0	187,655	187,655
90 & Over	<u>1</u>	<u>64</u>	<u>65</u>	<u>1,035</u>	<u>100,475</u>	<u>101,510</u>
Total	12	446	458	\$ 19,837	\$ 1,139,228	\$ 1,159,065

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





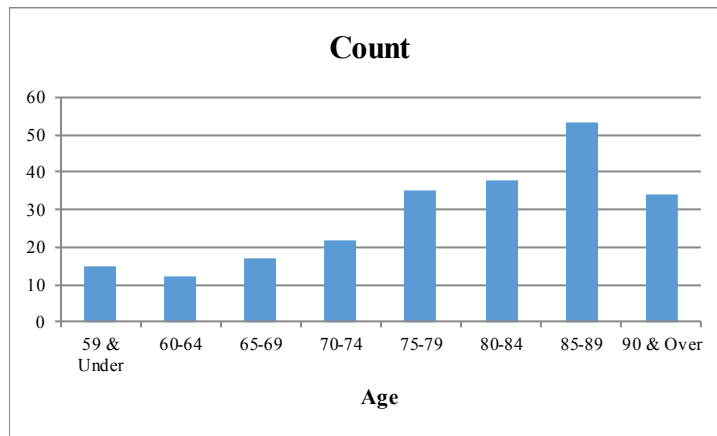
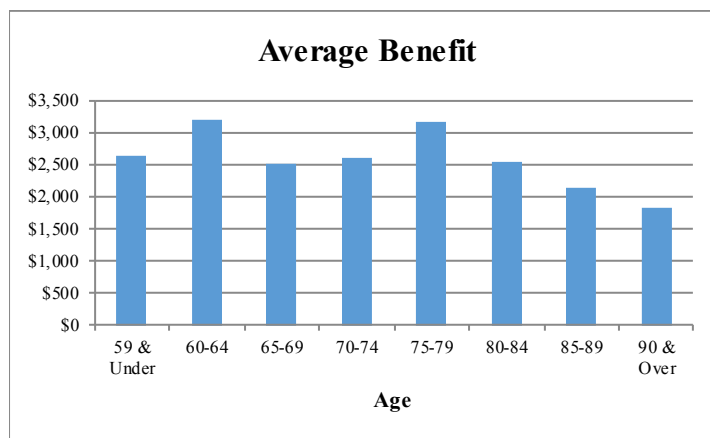
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF BENEFICIARIES
as of January 1, 2019**

Firemen

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
59 & Under	3	12	15	\$ 6,030	\$ 33,667	\$ 39,697
60-64	0	12	12	0	38,316	38,316
65-69	1	16	17	125	42,731	42,856
70-74	0	22	22	0	57,041	57,041
75-79	0	35	35	0	110,793	110,793
80-84	0	38	38	0	96,796	96,796
85-89	0	53	53	0	112,930	112,930
90 & Over	<u>0</u>	<u>34</u>	<u>34</u>	<u>0</u>	<u>62,407</u>	<u>62,407</u>
Total	4	222	226	\$ 6,155	\$ 554,681	\$ 560,836

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





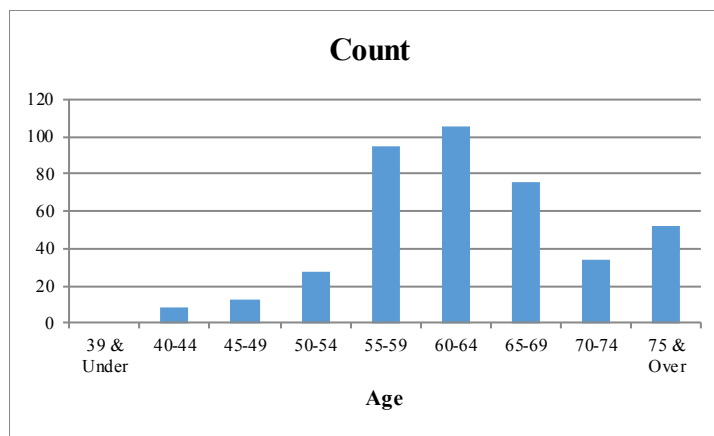
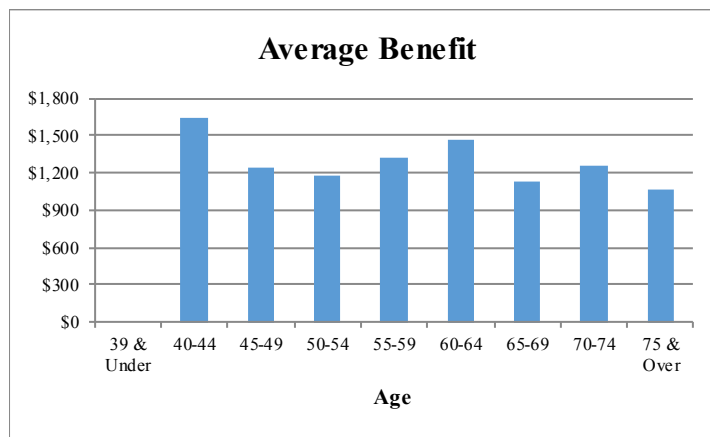
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF DISABLED MEMBERS
as of January 1, 2019**

General Employees

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
39 & Under	0	0	0	\$ 0	\$ 0	\$ 0
40-44	4	4	8	5,861	7,260	13,121
45-49	7	6	13	9,325	6,914	16,239
50-54	11	16	27	17,216	14,615	31,831
55-59	47	48	95	77,512	47,989	125,501
60-64	54	51	105	104,322	49,282	153,604
65-69	41	35	76	51,186	34,797	85,983
70-74	21	13	34	30,445	12,316	42,761
75 & Over	<u>26</u>	<u>26</u>	<u>52</u>	<u>37,508</u>	<u>18,292</u>	<u>55,800</u>
Total	211	199	410	\$ 333,375	\$ 191,465	\$ 524,840

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





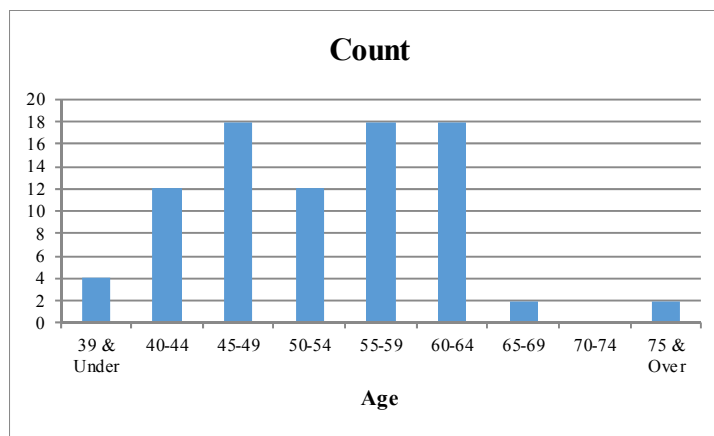
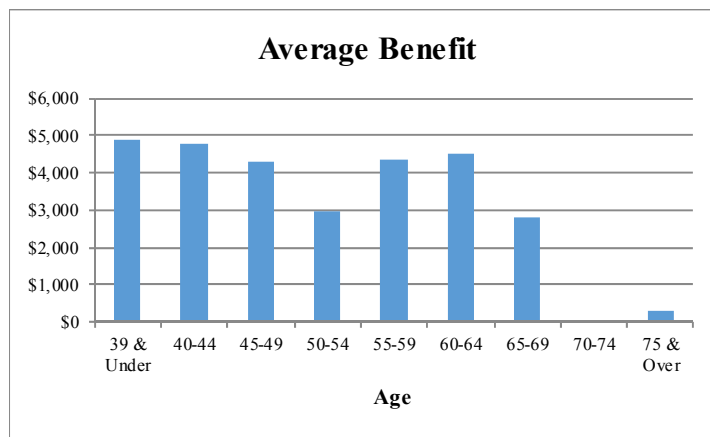
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF DISABLED MEMBERS
as of January 1, 2019**

Policemen

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
39 & Under	3	1	4	\$ 15,268	\$ 4,354	\$ 19,622
40-44	10	2	12	47,695	9,822	57,517
45-49	8	10	18	32,108	45,304	77,412
50-54	9	3	12	23,552	11,727	35,279
55-59	11	7	18	48,673	29,696	78,369
60-64	10	8	18	45,577	36,073	81,650
65-69	2	0	2	5,624	0	5,624
70-74	0	0	0	0	0	0
75 & Over	<u>2</u>	<u>0</u>	<u>2</u>	<u>585</u>	<u>0</u>	<u>585</u>
Total	55	31	86	\$ 219,082	\$ 136,976	\$ 356,058

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





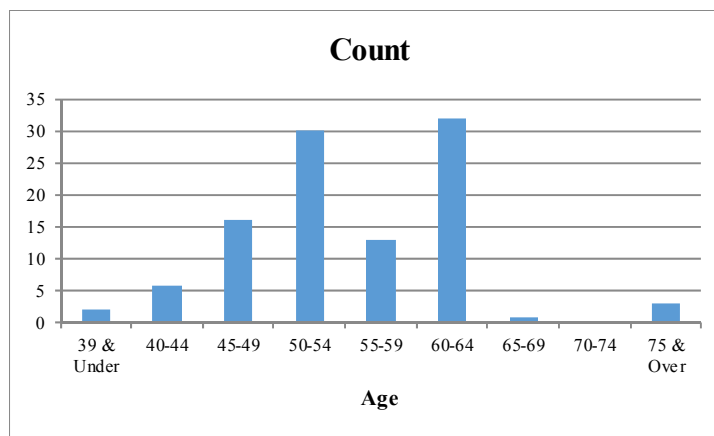
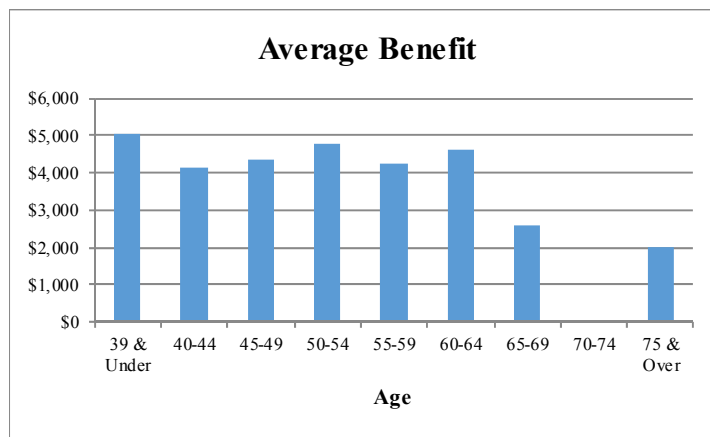
APPENDIX A: MEMBERSHIP DATA

**SUMMARY OF DISABLED MEMBERS
as of January 1, 2019**

Firemen

Age	Count			Monthly Benefits		
	Male	Female	Total	Male	Female	Total
39 & Under	2	0	2	\$ 10,088	\$ 0	\$ 10,088
40-44	6	0	6	24,688	0	24,688
45-49	16	0	16	69,842	0	69,842
50-54	25	5	30	119,661	22,906	142,567
55-59	11	2	13	47,290	8,092	55,382
60-64	27	5	32	130,219	17,087	147,306
65-69	1	0	1	2,577	0	2,577
70-74	0	0	0	0	0	0
75 & Over	<u>3</u>	<u>0</u>	<u>3</u>	<u>6,077</u>	<u>0</u>	<u>6,077</u>
Total	91	12	103	\$ 410,442	\$ 48,085	\$ 458,527

Note: The counts shown are for members who are receiving benefits as of January 1, 2019. Benefit amounts are the full December monthly payment and have been reduced for any workers' compensation offsets.





APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

SUMMARY OF BENEFIT PROVISIONS

A summary of the main benefit provisions of the Retirement System and of the sources of revenue from which benefits are paid is presented in the following digest. Items in parentheses in the text are the provisions applicable to law enforcement officers.

Eligibility for Membership

Membership is optional for all Employees that were in service as of January 1, 1938. New Employees are automatically members as a condition of employment. Membership is optional for elected officials. Note that unless specifically stated, elected officials follow the same rules as General Employees.

Additionally, effective January 1, 2014, there are two tiers of benefits. Tier 1 is for General Employees enrolled prior to January 1, 2014, and all Fire and Police Employees. Tier 2 is for General Employees enrolled on or after January 1, 2014.

Participation in the Combined Fund

On January 19, 2001 the Combined Fund was created and was retroactive to January 1, 2000. Individuals who participate in the Combined Fund may be eligible for certain benefit enhancements which are described in this Summary of Plan Provisions. Members who enroll in the ERS after June 28, 2000, and their eligible survivors, are automatically participants in the Combined Fund. Members enrolled in the ERS on or before June 28, 2000, and their eligible survivors, participate in the Combined Fund provided that the members consented in writing to the Global Pension Settlement. Eligible survivors of members or retirees who died on or before June 28, 2000 participate in the Combined Fund provided that the eligible survivors consented in writing to the Global Pension Settlement. Members or survivors whose benefit payments ceased prior to January 1, 2000, are not eligible for benefits from the Combined Fund.

Creditable Service

Creditable service equals prior service plus membership service. Prior service includes service as an employee prior to January 1, 1938, or prior to an amendment which made the employee eligible for membership in the ERS. Membership service means service as an employee since last becoming a member, on account of which contributions are made.

- For most Employees, 2080 hours of service constitute one year of creditable service. For prevailing wage Employees (carpenters and other tradespeople) 2000 hours constitute one year. For members employed by the school board for a 10-month school year, 1600 hours of service constitute a year of creditable service. After July 2006, for members serving as firefighters, 2590 hours of service constitutes one year of creditable service. After September 2016, for members serving as firefighters, 2756 hours of service constitutes one year of creditable service.
- Under certain conditions creditable service may be granted for periods of absence due to military service.
- For purposes of computing the service retirement allowance only, creditable service is granted for periods of eligibility for a duty disability retirement allowance.
- No more than one year of creditable service is granted for service in a single calendar year.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Imputed Service

Imputed service credit may be granted, under specified conditions, to members who consented to the Global Pension Settlement. Imputed service credit is used to calculate the amount of certain benefits, but is not used to determine eligibility for any kind of benefit. An individual may be eligible for one or more types of imputed service credit.

Eligibility for Imputed Service Credit

Only individuals participating in the Combined Fund can become eligible for the following types of imputed service credit.

- a) Imputed military service credit: The member must have been active in the armed forces of the United States of America prior to his or her enrollment in the ERS, and must have been honorably discharged. A member must be described as in 36-04-1-c. An individual eligible for imputed military service credit must apply for the credit.
- b) Imputed fire and police service credit: The member must be described as in 36-04-4-a. The member must have been in active ERS service as a fireman or policeman as of January 1, 2000, and must also retire from ERS service as a fireman or policeman, or die while a fireman or policeman eligible for protective survivorship option benefits. To be eligible, the member must retire or die as a policeman or fireman and must have attained the minimum service retirement requirements as outlined in 36-05-1.
- c) Imputed service credit under the dissolution of the Firemen and Policemen's Survivorship Fund, (the "Fund"): The member must be described as in 36-04-4-b. The member must have been a policeman who was an active member of the "Fund" as of January 1, 2000. If the policeman was in active ERS service as of January 1, 2000, he must either retire as a policeman on a service retirement allowance at the minimum service retirement age of 57 or after completing 25 years of creditable service as a fireman or policeman; or he must retire on a policeman's duty disability retirement allowance and subsequently convert to a service retirement allowance. If the policeman was retired on a duty disability retirement allowance as of January 1, 2000, then he must subsequently convert to a service retirement allowance.

Benefits Affected by Imputed Service Credit

- a) Imputed military service credit and/or imputed fire and police service credit: The amount of the service retirement allowance, the conversion service retirement allowance, protective survivorship option benefits, and the extended life duty disability retirement allowance are affected. If the eligible individual is also entitled to a 5% Lump Sum Bonus, and/or an 8.6% Dissolution Bonus that is based on the affected benefit, then the imputed service credit is included in calculating the base for the bonus payment(s).
- b) Imputed service credit under the dissolution of the Firemen and Policemen's Survivorship Fund: The amount of the service retirement allowance and the conversion service retirement allowance are affected. If the service retirement allowance is affected, then the imputed service credit is included in calculating the base for the 5% Lump Sum Bonus.

See the benefit descriptions later in this summary for further details on how imputed service credit is used.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Amount of Imputed Service Credit

- a) Imputed military service credit: A period of eligible military service consists of a period of at least 90 consecutive days of active service in the armed forces of the United States prior to enrollment in the ERS. Total eligible military service equals the sum of all periods of eligible military service. Imputed military service credit equals one-third of the member's total eligible military service, to a maximum of three years of imputed military service credit.
- b) Imputed fire and police service credit: For policemen and firemen with 20 years of creditable service as a fireman or policeman - 1.5 years. For firemen with less than 20 years of creditable service as a fireman or policeman: 1.5 years times the full years of creditable fire and police service, divided by 20.
- c) Imputed service credit under the dissolution of the Firemen and Policemen's Survivorship Fund: 2 years.

Seasonal Service

Seasonal service credit may be granted under specified conditions to certain General City Employees. Seasonal service credit is used to calculate the amount of certain benefits but is not used to determine eligibility for any kind of benefit.

Eligibility for Seasonal Service Credit

In order to be eligible for seasonal service credit, a member must be a General City employee with five or more years of City service credit, and a member of one of the groups as outlined in 36-04-1-d.

Benefits Affected by Seasonal Service Credit

Seasonal service credit affects the amount of the service retirement allowance, the conversion service retirement allowance and protective survivorship option benefits. If the eligible individual is also entitled to a 5% Lump Sum Bonus that is based on the affected benefit, then the seasonal service credit is included in calculating the base for the bonus payment.

Amount of Seasonal Service Credit

Seasonal service is based on the hours worked as a City Labor-Seasonal employee and/or Playground Laborer-Seasonal employee (MPS), but limited to one year of additional service credit.

Qualifying for an ERS Benefit

Rules regarding qualifying time are encapsulated in the ERS Board Rules & Regulations, XV.G. The rules have been adopted and applied prospectively for enrollments prior to 1995, 1995 to 2001 and post 2001. All members are fully vested after attaining four years of qualifying time.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Earnable Compensation

The annual regular base salary that would be payable to a member if he or she worked the full normal working time for his or her position as described in 36-02-12. Earnable compensation for the calendar year preceding retirement may also include special pays as negotiated in labor agreements such as longevity in rank pay, (limited) variable shift assignment pay, police liaison officer pay, and/or certification pay for policemen; and emergency medical technician pay for firemen. Earnable compensation for school board Employees represented by Local 950, OEIU, also includes site differential pay.

Final Average Salary

- a) For General Employees, final average salary means the average annual earnable compensation computed on the 3 years of creditable service preceding retirement, death or separation from service during which earnable compensation was the highest.
- b) For policemen and firemen, final average salary means the average annual earnable compensation computed on the year of creditable service preceding retirement, death or separation from service during which earnable compensation was the highest.
- c) For members converting from a duty disability retirement allowance to a service retirement allowance, the service retirement allowance is computed on the basis of the current compensation of the member's position at the service retirement date.

Service Retirement

Eligibility for Service Retirement

For Tier 1 Benefits (applicable to General Employees enrolled prior to January 1, 2014 and all Fire and Police Employees), eligibility for service retirement is as defined under 36-05-01 as follows:

- a) A service retirement allowance is payable to any member who elects to retire after attaining the minimum service retirement age, which is age 60 for General Employees and age 57 for policemen and firemen.
- b) General Employees that have attained age 55 and completed 30 years of qualifying time are eligible for service retirement.
- c) Policemen who participate in the Combined Fund are eligible for service retirement at any age after attaining 25 years of fire or police qualifying time, if they were hired prior to December 20, 2015.
- d) Policemen who participate in the Combined Fund, who have attained age 50 are eligible for service retirement after completing 25 years of police qualifying time, if they were hired on/after December 20, 2015.
- e) Firemen who participate in the Combined Fund, who have attained age 49 and completed 22 years of fire or police qualifying time, are eligible for service retirement, if they were hired prior to July 30, 2016.
- f) Firemen who participate in the Combined Fund, who have attained age 52 and completed 25 years of fire qualifying time, are eligible for service retirement, if they were hired on/after July 30, 2016.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

- g) Policeman and firemen who are not participants in the Combined Fund are eligible for service retirement after attaining age 52 and completing 25 years of fire or police qualifying time.

For Tier 2 Benefits (applicable to General Employees enrolled on or after January 1, 2014), eligibility for service retirement is as defined under 36-05-01 as follows:

- a) A service retirement allowance is payable to any member who elects to retire after attaining the minimum service retirement age, which is age 65 for General Employees.
- b) General Employees that have attained age 60 and completed 30 years of qualifying time are eligible for service retirement.

Amount of Service Retirement Allowance

The amount of a member's service retirement allowance under 36-05-01 is equal to the following:

- a) For General Employees, enrolled prior to January 1, 2014, 2% of final average salary for each year of creditable service, imputed military service, or seasonal service limited to 70% of final average salary. For General Employees, enrolled on or after January 1, 2014, 1.6% of final average salary for each year of creditable service, imputed military service, or seasonal service limited to 70% of final average salary.
- b) For firemen enrolled prior to March 1, 1989, and policemen enrolled prior to July 1, 1989, and who were in active service on or after January 1, 1995, 2.5% of final average salary for each year of creditable service or imputed service (of any kind).
- c) For firemen enrolled after February 28, 1989, and policemen enrolled after June 30, 1989, 2.5% of final average salary for each year of creditable service or imputed military service, limited to 90% of final average salary, plus 2.5% of final average salary for each year of imputed fire and police service or imputed service under the dissolution of the Firemen and Policemen's Survivorship Fund.
- d) For elected officials enrolled prior to January 1, 2014, 2.6% of final average salary for each year of creditable service as an elected official for years before 1996, limited to 70% of the final average salary; from 1996 forward the rate of accrual for creditable service, imputed military service, or seasonal service is 2.5% except for the mayor, who will have an accrual rate of 2.0%, limited to 70% of the final average salary, except for elected officials who were enrolled prior to 2014 and are first elected to office on or after January 1, 2014, in which case their accrual rate is 2% for each year if they contribute 5.5% of their earnable compensation, or 2.5% for each year if they contribute 7% of their earnable compensation. For elected officials enrolled on or after January 1, 2014, 1.6% of final average salary for each year of creditable service as an elected official limited to 70% of the final average salary.

Funds Charged with Service Retirement Allowance

For individuals participating in the Combined Fund, service retirement allowance payments are charged to the Combined Fund. For all other individuals, the service retirement allowance is charged to (i) the Retirement Fund if the member's enrollment date is prior to February 1, 1996, and (ii) the Combined Retirement and Disability Fund if the member enrolled on or after February 1, 1996.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Ordinary Disability Retirement Allowance

Eligibility for Ordinary Disability Retirement Allowance

A member who the medical council certifies is mentally or physically incapacitated for further performance of duty that such incapacity is likely to be permanent and that such member should be retired, is eligible for the ordinary disability retirement allowance. The ordinary disability allowance is not payable if the member qualifies for the duty disability allowance.

Amount of Ordinary Disability Retirement Allowance

Imputed service credit and seasonal service credit are not used in any part of the calculation of the Ordinary Disability Retirement Allowance. The “service retirement allowance” referred to below is calculated based on creditable service only.

- a) For General Employees, 90% of the service retirement allowance based on creditable service to date of disability retirement, but no less than 25% of final average salary, provided such amount does not exceed 90% of the retirement allowance payable had the member continued in service to the minimum service retirement age.
- b) For policemen and firemen hired after January 1, 1971, who have 5 years of service, 25% of final average salary plus 2% thereof for each year of creditable service in excess of 5 years up to a maximum of 50% of final average salary.
- c) For policemen and firemen hired before January 1, 1971, the greater of the benefit described in (a), or the benefit described in (b).
- d) The benefit is payable for life while the member remains disabled, except that for General Employees with less than 10 years of qualifying time, the duration is limited to one-fourth (1/4) of the period of the service accrued to the date of disability.
- e) Members receiving benefits for life may elect reduced benefits under an optional form of payment in order to provide a death benefit to a designated beneficiary.

Funds Charged with Ordinary Disability Retirement Allowance

Ordinary disability retirement allowance payments are charged to the Combined Fund if the eligible individual is a participant in the Combined Fund. Otherwise, the allowance is charged to (i) the Retirement Fund, if the member’s enrollment date is before February 1, 1996, and (ii) the Combined Retirement and Disability Fund, if the member’s enrollment date is on or after February 1, 1996.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Duty Disability Retirement Allowance

Eligibility for Duty Disability Retirement Allowance

If a member becomes permanently and totally incapacitated for duty as a result of the performance of his duty, and his mental or physical incapacitation is medically certified, such member is eligible for a duty disability retirement allowance. Unless the member is beyond his/her conversion age, in which case the member would be eligible for an extended lifetime Duty Disability benefit. The medical certification is made by the Medical Council for General Employees, for members of the MPA enrolled after June 28, 2005, and for members of the MPFFA enrolled after December 13, 2005 with disability based on a mental injury. For all other members, the medical certification is made by the Medical Panel, except as indicated below. There are certain diseases that are considered presumptive for purposes of duty disabilities.

All new duty disability applications are reviewed by the Medical Council effective June 19, 2016 for MPA members, effective January 1, 2016 for MPSO members, and effective July 29, 2016 for MPFFA members.

Effective July 14, 2015, a new state law was enacted related to duty disability benefits for mental injuries (section 62.624 Wis. Stat.). The ERS may only provide a duty disability benefit for a mental injury if the following criteria are met:

- a) The mental injury resulted from a situation of greater dimensions than the day-to-day mental stresses and tension and post-traumatic stress that all similarly situated Employees must experience as part of the employment, *and*
- b) The employer certifies that the mental injury is a duty-related injury.

Only if a duty-related mental injury has occurred, can the duty disability application be forwarded to the Medical Panel or Medical Council for the examination and requisite certification.

Amount of Duty Disability Related Benefits

Imputed service credit and seasonal service credit are not used when calculating a duty disability retirement allowance. Imputed service credit or seasonal service credit is used when calculating the conversion service retirement allowance referred to in paragraphs (a) - (c) below. Eligibility for imputed military service credit depends upon the date of the conversion, not upon the date of the duty disability retirement.

- a) For General Employees, the duty disability retirement allowance equals 75% of the member's final average salary. Members receive the allowance, while disability continues, until the later of age 65, or for a period of 5 years, at which time they convert to a service retirement allowance. General Employees receiving duty disability benefits may elect reduced benefits under an optional form of payment in order to provide a death benefit to a designated beneficiary.
- b) For firemen and policemen, the duty disability retirement allowance is 75% of the current annual salary for the position held by the member at retirement, plus \$40 per month for each child younger than age 18 (up to a maximum of 20% of the member's salary). In certain cases of extreme disability, when approved by a panel of physicians, the disability allowance will be 90% of such salary. Duty disability benefits paid to firemen on account of heart and lung disease are at the 75% level. In the event of the death of a policeman or fireman receiving a 75% or 90% disability



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

allowance, 70% or 75%, respectively, of the amount of the member's allowance shall be paid to the member's spouse during her lifetime.

The 90% duty disability allowances are payable for life. For policemen enrolled on or after January 1, 1990, and firemen enrolled on or after December 17, 1989, the 75% duty disability allowances are payable until the earlier of attainment of age 57, or completion of 25 years of service and attainment of age 52, at which time the member must either convert to a service retirement allowance or irrevocably elect to receive a recalculated duty disability allowance, referred to as an extended life duty disability allowance, as described in (c), below. Different conversion age requirements apply to policemen enrolled prior to January 1, 1990, and firemen enrolled prior to December 17, 1989, as discussed in (d), below. A fireman or policeman who becomes duty disabled on or after his conversion age may choose between a service retirement or extended life duty disability retirement.

- c) The extended life duty disability allowance referred to in (b), above, equals the lesser of the conversion service retirement allowance, or 75% of the current annual salary, provided further that the benefit will not be less than 57% of current annual salary for a fireman, or 60% of current annual salary for a policeman. "Current annual salary" here refers to the salary at the conversion age, for the position held by the member at the time of injury. The extended life duty disability allowance is payable for life and, unlike the duty disability allowance, is a fixed amount that does not change after the conversion age, notwithstanding any cost of living adjustments. Firemen or policemen receiving extended life duty disability benefits may elect reduced benefits under an optional form of payment in order to provide a death benefit to a designated beneficiary. Their spouses are not eligible to receive the 70% benefit payable to surviving spouses of firemen and policemen who die while in receipt of the 75% duty disability benefit.
- d) For policemen enrolled prior to January 1, 1990, and firemen enrolled prior to December 17, 1989, the conversion age determination depends upon the member's enrollment date and whether or not the member signed the DeBraska II release form.

Under Charter Ordinance 980130 Substitute 2 (DeBraska I), duty disabled firemen and policemen who retired on duty disability before October 17, 1992, have a conversion age equal to the greater of the conversion age in effect when they were enrolled, or the conversion age in effect at the time of their disability retirement.

Under Charter Ordinance 000789 (DeBraska II), duty disabled firemen and policemen who signed the DeBraska II release form are subject to the following conversion requirements: (i) members retired on duty disability prior to February 8, 1972, will receive duty disability benefits for life; (ii) members enrolled prior to February 8, 1972, who are either policemen who retired on duty disability on or after August 1, 1985, or firemen who retired on duty disability on or after March 1, 1984, will have a conversion age of 63; (iii) members enrolled on or after February 8, 1972, who retired on duty disability on or after October 17, 1992, will not be required to convert to service retirement prior to the conversion age requirements that were in effect when they enrolled; and (iv) for all other members who signed the DeBraska II release form, there is no difference between the conversion requirements of Charter Ordinance 980130 Substitute 2, and Charter Ordinance 000789. In general, only members who were duty disabled prior to January 1, 2001 were given the opportunity to sign the DeBraska II release form.

Under the Charter Ordinance (which reflects the Rehrauer decision) firemen and policemen who



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

retire (or previously retired) on duty disability and who did not sign the DeBraska II release form will convert at the highest conversion age agreed upon during their employment (Section 36-05-3). Members who enrolled prior to February 8, 1972, who are either policemen who retired on duty disability on or after November 1, 1976, or firemen who retired on duty disability on or after October 1, 1977, will receive duty disability for life if they did not sign the DeBraska II release form, and will have a conversion age of 63 if they did sign the DeBraska II release form.

Funds Charged with Duty Disability Related Benefits

- a) For participants in the Combined Fund, duty disability benefits paid to members, benefits paid to survivors of members who die while duty disabled, child allotment payments, conversion service retirement benefits, and extended life duty disability benefits are paid from the Combined Fund.
- b) For General Employees who do not participate in the Combined Fund, duty disability benefits, and survivor benefits paid to beneficiaries of General Employees who elect an optional form of payment and die while disabled, are paid from (i) the General Employees Duty Disability Fund if the member's enrollment date is prior to February 1, 1996, and (ii) the Combined Retirement and Disability Fund if the member's enrollment date is on or after February 1, 1996.
- c) For members who do not participate in the Combined Fund, benefits paid after conversion to either a service retirement allowance or an extended life disability benefit are charged to (i) the Retirement Fund if the member's enrollment date is prior to February 1, 1996, and (ii) the Combined Retirement and Disability Fund if the member's enrollment date is on or after February 1, 1996.

Ordinary Death Benefit

Eligibility and Amount of Ordinary Death Benefit

- a) In the event of death of a member while in service, a death benefit equal to the sum of the member's accumulated contributions, plus if the member has one or more years of active service, one-half his final average salary is payable to the designated beneficiary. Optional forms of payment of such benefit to the beneficiary are provided. If the member had elected a protective survivorship option – and duty death benefits are not payable – such option will become effective and the ordinary death benefit will not be payable. If a duty death benefit is payable the ordinary death benefit will not be paid.
- b) Unless the member elects an optional death benefit, the death benefit subsequent to retirement is the amount remaining, if any, of the member's contributions with interest to retirement less the sum of the allowance payments made prior to the member's death.

Funds Charged with Ordinary Death Benefits

Ordinary death benefits paid on behalf of a participant in the Combined Fund are charged to the Combined Fund. Otherwise, ordinary death benefits are charged to (i) the Retirement Fund if the member's enrollment date is prior to February 1, 1996, and (ii) the Combined Retirement and Disability Fund if the member's enrollment date is on or after February 1, 1996.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Protective Survivorship Option

Eligibility and Amount of Protective Survivorship Option

Firemen may elect a Protective Survivorship Option (PSO) during the 6 months that precede the earlier of attainment of age 49 and completion of 22 years of qualifying time as a fireman or policeman, or age 52 and 25 years of qualifying time as a fireman or policeman, or age 57. Policemen may elect a Protective Survivorship Option (PSO) during the 6 months that precede the earlier of attainment of age 57, or completion of 25 years of qualifying time as a policeman or fireman. Firemen and policemen who fail to elect a PSO during the eligible period are deemed to have elected an Option 2 PSO with the spouse as the named beneficiary.

General Employees who enrolled prior to January 1, 2014, may elect a PSO during the 6 months that precede the earlier of attainment of age 60 or completion of 30 years of qualifying time and attainment of age 55. General Employees who enrolled on or after January 1, 2014, may elect a PSO during the 6 months that precede the earlier of attainment of age 65, or completion of 30 years of qualifying time and attainment of age 60.

Firemen and policemen are allowed to reselect a PSO if they marry, or divorce, and to select a different option and/or beneficiary at retirement, if they wish. As of June 5, 2012, General Employees may also reselect a PSO if they marry, or divorce, or select a different option and/or beneficiary at retirement.

The PSO may be canceled if the joint annuitant predeceases the member before retirement; or if the member is divorced from the joint annuitant before retirement.

Under a PSO, if a member eligible to retire on a service retirement allowance dies prior to retirement, benefits begin to the named beneficiary just as if the member retired under such option immediately prior to his or her death, except that imputed service credit arising from the dissolution of the Firemen and Policemen's Survivorship Fund will not be used in the calculation of the PSO benefit. If a fireman eligible for PSO coverage dies prior to age 49, benefits for the named beneficiary will be deferred until the date the fireman would have attained age 49. Imputed military service, imputed fire and police service, and seasonal service credit may be used in the calculation of the deferred PSO benefit.

In all cases where the requirements are met for both a PSO benefit and a duty death benefit, the duty death benefit will be payable in lieu of the PSO.

Funds Charged with PSO Benefits

PSO benefits for participants in the Combined Fund are charged to the Combined Fund. Benefits for individuals who do not participate in the Combined Fund are charged to (i) the Retirement Fund if the member's enrollment date is prior to February 1, 1996, and (ii) the Combined Retirement and Disability Fund if the member's enrollment date is on or after February 1, 1996.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Duty Death Benefits

Eligibility and Amount of Duty Death Benefits

In the event the member's death occurs in the performance of his duty, a lump sum payment equal to the member's accumulated contributions, plus an annuity of 60% of such deceased member's final average salary will be paid to one of the following (payable in this order):

- The member's surviving spouse
- The member's children until their 21st birthday
- The member's dependent parents
- Death of a fireman that is due to heart or lung disease is considered a duty death.

Funds Charged with Duty Death Benefits

Benefits payable to participants in the Combined Fund are charged to the Combined Fund. Heart & Lung duty death benefits payable to individuals who are not participants in the Combined Fund are charged to the Heart & Lung Fund. Duty death benefits (other than Heart & Lung) payable to individuals who are not participants in the Combined Fund are charged to (i) the Retirement Fund for members whose enrollment dates are prior to February 1, 1996; and (ii) the Combined Retirement and Disability Fund for members whose enrollment dates are on or after February 1, 1996.

Member Contributions

Member contribution rates are the following percentages of annual salary:

General Employees	5.5% (tier 1 – enrolled prior to January 1, 2014) 4.0% (tier 2 – enrolled on or after January 1, 2014)
Firemen and Policemen- Elected Officials	7.0% 7.0% (tier 1 – enrolled prior to January 1, 2014 and elected to an office prior to January 1, 2014; if enrolled prior to January 1, 2014, and elected or the first time to an office on or after January 1, 2014, and employee was paying contributions prior to being elected, employee pays contributions at the rate they were paying prior to becoming an elected official; if enrolled prior to January 1, 2014, and elected or the first time to an office on or after January 1, 2014, and employer was picking up contributions on behalf of the employee prior to being elected, employer pays 7.0%) 4.0% (tier 2 – enrolled on or after January 1, 2014)

Under state law, per 2011 Wisconsin Act 10, participating employers are no longer permitted to make contributions on the member's behalf (with the exception of contractually agreed upon arrangements).

Member contributions made for or by participants in the Combined Fund are credited to the Combined Fund. Member contributions made for or by individuals who are not participants in the Combined Fund are credited to (i) the Retirement Fund for members whose enrollment dates are prior to February 1, 1996; and (ii) the Combined Retirement and Disability Fund for members whose enrollment dates are on or after February 1, 1996.



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Pension Escalators

Several different pension escalators are paid by the ERS as listed and described under section 36-05-1(h). They are as follows:

- Fire and Police \$50 Escalator

Eligible Groups and Amounts

- a) Firemen in Local 215 who retired under a service retirement allowance between March 1, 1990, and December 31, 1992; members of the Milwaukee Police Association (MPA) who retired under a service retirement allowance between January 1, 1990, and December 31, 1992; members of the Milwaukee Police Supervisors Organization who retired under a service retirement allowance between January 1, 1991, and December 31, 1992; and firemen in Local 215 or members of the MPA who elect a deferred retirement allowance after separating from service between January 1, 1993, and December 31, 1994, with 25 years of service; are eligible for a pension escalator which increases their allowance by \$50 per month on the 4th, 7th, and 10th anniversary of retirement.
- b) Members who both retired on duty disability and converted from duty disability to service retirement during the eligibility period are eligible for the escalators on the 4th, 7th, and 10th anniversaries of their conversion dates.
- c) The surviving spouses of eligible retirees, or of members who died during the eligibility period, are eligible provided that the member elected an optional benefit at retirement – or elected a protective survivorship option (PSO) prior to retirement – with the spouse as beneficiary. The member's surviving spouse receives increases on the member's 4th, 7th, and 10th anniversary of retirement (or spouse's retirement date in the case of a PSO) with the amount of the escalator adjusted to reflect the option elected by the member.

Funds Charged with Duty Death Benefits

Fire and Police \$50 escalators paid to participants in the Combined Fund are charged to the Combined Fund.

Fire and Police \$50 escalators paid to individuals who are not participants in the Combined Fund are charged to the Retirement Fund.

- January 1996 Catch-up COLA for pre-October, 1987 Retirees

Eligible Group

- a) General Employees that attained the minimum service retirement age and retired with a service retirement allowance prior to October 1, 1987, or who retired on a duty disability allowance and converted to a service retirement allowance prior to October 1, 1987.
- b) Firemen and policemen who retired prior to October 1, 1987, who became eligible to retire on service retirement at age 57, or after attaining age 52 and completing 25 years of service. Also,



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

firemen and policemen who retired on a duty disability allowance and converted to a service retirement allowance prior to October 1, 1987.

- c) Surviving spouses of eligible retirees, or of members who elected a PSO and died prior to October 1 1987, after naming their spouse as the designated beneficiary under Option 2, Option 3, or Option 4 with a percentage to the beneficiary.

Timing and Amount of Increase

The catch-up COLA was a permanent increase in the ERS monthly benefit which was granted effective January 1, 1996. The increase was an amount equal to (i) the total ERS benefit in payment, multiplied by the greater of (ii) the total percentage change in the cost of living for each full calendar month between the 8th anniversary of service retirement and October 1, 1995, and (iii) the total percentage change required to bring the member's allowance to 60% of its full inflation adjusted value considering inflation for the period from retirement to October 1, 1995. The percentage change in the cost of living was measured by the increase in the CPI-U, U.S. Cities, as reported by the U.S. Department of Labor, Bureau of Labor Statistics.

When the catch-up COLA was calculated, the factor was not applied to supplemental, pass through benefits, which are paid by the ERS but are not a liability of the ERS. These pass through benefits, which appear on the pension payroll data supplied to the actuary, are part of an old guaranteed minimum program. The ERS is a paying agent for these benefits, but is reimbursed by the City for all such payments.

Funds Charged

Catch-up COLA amounts paid to participants in the Combined Fund are charged to the Combined Fund. Catch-up COLA amounts paid to individuals who are not participants in the Combined Fund are charged to the Retirement Fund.

- 2% Escalator for pre-1993 Retirees

Eligible Group

- a) General Employees that attained the minimum service retirement age and retired with a service retirement allowance prior to January 1, 1993, or who retired on a duty disability allowance and converted to a service retirement allowance prior to January 1, 1993.
- b) Firemen and policemen who retired prior to January 1, 1993, who became eligible to retire on service retirement at age 57, or after attaining age 52 and completing 25 years of service. Also, firemen and policemen who retired on a duty disability allowance and converted to a service retirement allowance prior to January 1, 1993.
- c) Surviving spouses of eligible members who elected Option 3 with the spouse as the beneficiary, or of members who died prior to January 1, 1993 after electing an Option 3 PSO with the spouse as the beneficiary.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Timing and Amount of Increase

The first increase occurs with the later of the January 1996 installment or the installment next following the 8th anniversary of the member's service retirement date (or the 8th anniversary of the surviving spouse's retirement date in the case of a PSO). Thereafter, increases occur annually on the anniversary of the first increase.

The first increase is 2% of the total ERS benefit in payment. That is, the monthly benefit to which the increase is applied includes \$50 fire and police escalators, and the January, 1996 catch-up COLA amount, if any, but it excludes supplemental pass through payments, if any. Increases after the first are also 2%, and are compounded -- that is, they are applied to the total ERS benefit in payment, including all prior increases, and again, excluding any supplemental pass through payments. (The benefit initially payable to an eligible spouse upon the member's death includes 50% of any increases in payment at the member's death.)

Funds Charged

2% escalators paid to participants in the Combined Fund are charged to the Combined Fund. 2% escalators paid to individuals who are not participants in the Combined Fund are charged to the Retirement Fund.

- CPI Escalator for post-1992 Fire and Police Retirees who don't Participate in the Combined Fund and Pre-2000 CPI Escalator for post-1992 Fire and Police Retirees who do Participate in the Combined Fund

Eligible Group

- a) Firemen and policemen in active service on or after January 1, 1993, who become eligible to retire on service retirement at age 57 or after attaining age 52 and completing 25 years of service.
- b) Firemen and policemen who retire on either a 75% Fire & Police duty disability benefit or a Heart & Lung duty disability benefit (i) between January 1, 1993, and December 31, 1994, and thereafter convert to service retirement; or (ii) on or after January 1, 1995, and who are eligible to elect between service retirement and extended life duty disability benefits at their conversion age.
- c) Police in active service on or after January 1, 1995, who separate with 25 years of service and elect a deferred retirement allowance.
- d) Surviving spouses of eligible members who elect Option 2 or 3, or who elect Option 4 with a percentage to the spouse, or who elect a PSO with a percentage to the spouse.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Timing and Amount of Increase

For members who retired on service retirement between January 1, 1993, and December 31, 1994; or who retired on duty disability between January 1, 1993, and December 31, 1994, and later convert to service retirement; and for eligible surviving spouses of members who died prior to retirement between January 1, 1993, and December 31, 1994, with PSO coverage in effect; the first increase occurs for March of the year following the first full calendar year of service retirement. For all others, the first increase occurs one full year after the member's service retirement date. Thereafter, increases occur annually on the anniversary of the first increase.

The monthly benefit is increased by an amount equal to (i) the total allowance for the preceding December (including all prior increases), multiplied by the lesser of (ii) 3%, and (iii) the increase in the CPI-U, U.S. Cities Average, for the calendar year preceding the increase. (The benefit initially payable to an eligible spouse upon the member's death includes a proportionate share of any increases in payment at the member's death, based on the option elected.)

Funds Charged

Benefits payable to participants in the Combined Fund are charged to the Combined Fund. For individuals who are not participants in the Combined Fund: (i) benefits are charged to the Retirement Fund for members whose enrollment dates are prior to February 1, 1996; and (ii) benefits are charged to the Combined Retirement and Disability Fund for members whose enrollment dates are on or after February 1, 1996.

- Post-1999 CPI Escalator for post-1992 Fire and Police Retirees who Participate in the Combined Fund

Eligible Group

The eligible group is restricted to individuals who were firemen and policemen who retired on duty disability between October 17, 1992, and December 31, 1992; or who were in active service on or after January 1, 1993, who either retire as firemen or policemen, or who die in active service as firemen or policemen; and their eligible surviving spouses. The types of benefits that receive the CPI escalator include:

- a) The service retirement allowance and ordinary disability retirement allowance.
- b) Benefits paid to members after the duty disability conversion age: the conversion service retirement allowance or the extended life duty disability retirement allowance.
- c) Benefits paid to members after separation from service: the deferred retirement allowance, early retirement allowance, involuntary separation allowance, or the ERS allowance paid under the County transfer or State reciprocity provisions.
- d) The spouse survivor allowance paid to the surviving spouse of an eligible member who elects Option 2 or 3, or who elects Option 4 with a percentage to the spouse, or who elects a PSO with a percentage to the spouse.
- e) The fire and police or heart & lung duty disability surviving spouse allowance.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

- f) The duty death surviving spouse allowance.

Timing and Amount of Increases that occur after 1999

- a) The first post-1999 increase occurs the later of March 2000 and March of the year following the first full calendar year of retirement for: members who retired on service retirement or ordinary disability between January 1, 1993, and December 31, 1994; or who convert to service retirement after a period of duty disability which commenced between January 1, 1993, and December 31, 1994; or who separated from service between January 1, 1993, and December 31, 1994, and subsequently retire on a deferred, early, involuntary separation, or County transfer/ State reciprocity allowance; eligible spouse survivors of such members, including PSO spouse survivors when the member died between January 1, 1993, and December 31, 1994; duty death surviving spouses of members who died between January 1, 1993, and December 31, 1994; and duty disability surviving spouses where both the member's duty disability retirement date and duty disabled death date were between January 1, 1993, and December 31, 1994.
- b) The first post-1999 increase occurs the later of the year 2000 anniversary or the first anniversary of the member's date of death for: duty disability surviving spouses where the member's duty disability death date is on or after January 1, 1995.
- c) For all others, the first post-1999 increase occurs the later of the year 2000 anniversary or the first anniversary of the member's retirement or pre-retirement death. (Note: this group includes members who retired on duty disability between October 17, 1992, and December 31, 1994, who subsequently elect an extended life duty disability retirement allowance, and members who retired on duty disability between October 17, 1992, and December 31, 1992, who subsequently convert to service retirement.)

Thereafter, increases occur annually on the anniversary of the first post-1999 increase.

The monthly benefit is increased by an amount equal to (i) the total allowance for the preceding December (including all prior increases), multiplied by the lesser of (ii) 3%, and (iii) the increase in the CPI-U, U.S. Cities Average, for the calendar year preceding the increase. If the member retired on duty disability between October 17, 1992, and December 31, 1992, and subsequently converts to service retirement, then the 2nd, 3rd, and 4th increases will not be less than 1.5%, and the 5th and subsequent increases will not be less than 2%. (The benefit initially payable to an eligible spouse upon the member's death includes a proportionate share of any increases in payment at the member's death, based on the option elected.)

Funds Charged

The CPI escalator is charged to the Combined Fund.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

- 2% Guarantee for Fire and Police CPI Escalator for Participants in Combined Fund

The eligible group is restricted to firemen and policemen who retire on service retirement, their spouse survivors, and PSO spouse survivors. In addition, firemen members of Local 215 and policemen members of the MPA must have been in active service on or after January 1, 1998; policemen members of the MPSO must have been in active service on or after January 1, 1999; and non-represented firemen and policemen must have been in active service on or after January 1, 2000. The benefit is a guarantee that the CPI Escalator will not be less than 2% per annum.

- 2% Escalator for post-1992 General Employee Retirees who do Not Participate in Combined Fund

Eligible Group

- a) General Employees who retire on a service retirement allowance on or after January 1, 1993 who have either (i) attained age 60, or (ii) completed 30 years of service and attained age 55.
- b) General Employees receiving a duty disability retirement allowance who convert to service retirement on or after January 1, 1993.
- c) Spouses of eligible members who either elect Option 3 at retirement with the spouse as beneficiary, or who die after electing an Option 3 PSO with the spouse as beneficiary.

Timing and Amount of Increase

The first increase occurs with the installment next following the 8th anniversary of the member's service retirement or conversion to service retirement date (or the 8th anniversary of the surviving spouse's retirement date in the case of a PSO). Thereafter, increases occur annually on the anniversary of the first increase.

Each increase is 2%, and increases after the first are compounded -- that is, they are applied to the total benefit in payment, including all prior increases. (The benefit initially payable to an eligible spouse upon the member's death includes 50% of any increases in payment at the member's death.)

Funds Charged

For members whose enrollment dates are prior to February 1, 1996, the 2% escalator for post-1992 general employee retirees is paid from the Retirement Fund. For members whose enrollment dates are on or after February 1, 1996, the 2% escalator for post-1992 general employee retirees is paid from the Combined Retirement and Disability Fund.

- Post-1999 1.5% / 2% Escalator for General Employee Retirees and for Pre-1993 Fire and Police Retirees who Participate in the Combined Fund

Eligible Group

The eligible group includes (i) pre-1993 retirees and surviving spouses who are not eligible for either the 2% Escalator for pre-1993 retirees, or the Post-1999 CPI Escalator for post-1992 fire and police retirees; and (ii) post-1992 general employee retirees and their surviving spouses. The types of benefits that receive the 1.5%/2% escalator include:



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

- a) The service retirement allowance and ordinary disability retirement allowance for all members, and the duty disability retirement allowance for General Employees.
- b) Benefits paid to members after the duty disability conversion age: the conversion service retirement allowance for all members or the extended life duty disability retirement allowance for fire and police.
- c) Benefits paid to members after separation from service: the deferred retirement allowance, early retirement allowance, involuntary separation allowance, or the ERS allowance paid under the County transfer or State reciprocity provisions.
- d) The spouse survivor allowance paid to the surviving spouse of an eligible member who elects Option 2 or 3, or who elects Option 4 with a percentage to the spouse, or who elects a PSO with a percentage to the spouse.
- e) The fire and police or heart & lung duty disability surviving spouse allowance.
- f) The duty death surviving spouse allowance.

Timing and Amount of Increases that occur after 1999

- a) The first post-1999 increase occurs for January 2000 for eligible Option 2 and 4 spouse survivors of members retired on a service retirement allowance or a conversion service retirement allowance - and for eligible Option 2 and 4 PSO spouse survivors - when the member's date of retirement or pre-retirement death was prior to January 1988.
- b) The first post-1999 increase occurs the later of the year 2000 anniversary or the 2nd anniversary of the member's date of death for: duty disability surviving spouses of firemen and policemen.
- c) For all others, the first post-1999 increase occurs the later of the year 2000 anniversary or the 2nd anniversary of the member's retirement or pre-retirement death.

Thereafter, increases occur annually on the anniversary of the first increase.

All increases for the group described in paragraph (a) are 2% increases. For paragraphs (b) and (c), an increase which takes effect on the 2nd, 3rd, or 4th anniversary is a 1.5% increase. An increase which takes effect on the 5th or subsequent anniversary is a 2% increase. Increases after the first one are compounded -- that is, they are applied to the total benefit in payment, including all prior increases. (The benefit initially payable to an eligible spouse upon the member's death includes the spouse's proportionate share of any increases in payment at the member's death, based on the option elected.)

Tier 2 Employees receive an increase of 2% on the fifth anniversary of their retirement and on each anniversary that follows, but only for service retirement.

Fire and Police Survivorship Benefits Prior to the Global Pension Settlement

The survivors of firemen or policemen who die in active service or while in receipt of a disability allowance may be entitled to a survivorship benefit. The survivorship benefit is payable to the spouse of the deceased member provided the spouse has one or more eligible children in her care. Eligible children include unmarried children who are either under the age of 18, or are over age 18, but who suffer from a disability which commenced before the age of 18. The amount of the survivorship benefit for a death occurring in 2000 is \$600 monthly for the spouse and one child or for two or more eligible children. If there is no surviving widow and only one child, the benefit is \$300. Upon attainment of age 57, \$300 is payable to the spouse for her lifetime. Benefits payable to a spouse cease on remarriage and benefits payable in respect of children cease on attainment of age 18 (unless disabled prior to age 18) or marriage. For member deaths



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

that occurred prior to 2000 the monthly amount payable depends upon the plan provisions in effect at the member's death.

Fire and Police Survivorship Benefits for Survivors Participating in the Combined Fund

Survivors of firemen or policemen who died prior to 2000 while in active service or while retired on disability (and contributing to the Fire and Police Survivorship Fund) may be entitled to a survivorship benefit. The survivorship benefit is payable to the spouse of the deceased member provided the spouse has one or more eligible children in her care. For participants in the Combined Fund, the amount of the survivorship benefit for a death occurring prior to 2000 is \$600 monthly for the spouse and one child under age 18, or for two or more children under age 18. If there is no surviving widow and only one child, the benefit is \$300. The monthly amount payable to a disabled child over the age of 18 depends upon the plan provisions in effect at the member's death. Upon attainment of age 57, \$300 is payable to the spouse for her lifetime. Benefits payable to a spouse cease on remarriage and benefits payable in respect of children cease on attainment of age 18 (unless disability commenced prior to age 18) or marriage.

Survivorship Benefits for Participants in the Combined Fund are charged to the Combined Fund.

Separation Benefits

Eligibility and Amounts

Should a member separate from service, and no other benefit is payable, such a member will possibly be entitled to one of the options outlined below. Additional eligibility information about Separation Benefits is provided under 36-05-6.

- a) If the member has less than four years of creditable service, a refund of member contributions (not paid by the member's employer). Interest at 4.0% per annum on the 4%, 5.5%, or 7% member paid contributions is also payable.
- b) If the member has four years of creditable service, a deferred allowance payable at the minimum service retirement age.
- c) A refund of the member contributions and interest, including contributions paid on the member's behalf, is payable to (i) General Employees after 4 years of creditable service, or (ii) firemen or policemen after 10 years of creditable service.
- d) If the member's service is involuntarily terminated, or the member terminates voluntarily after attaining age 55 and completing 15 years of creditable service, such member may elect to receive a deferred allowance at the minimum service retirement age, or an immediate allowance that is the actuarial equivalent of the deferred allowance.
- e) If the member has 25 years of qualifying time as a fireman or policeman, and is not participating in the Combined Fund, a deferred allowance payable at age 52.
- f) If the member is a fireman with 25 years of qualifying time as a fireman or policeman, had not attained age 49 at the date of separation from service, and is participating in the Combined Fund, a deferred allowance payable at age 52.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Imputed service credit and seasonal service credit are not used when calculating separation benefits.

Funds Charged with Separation Benefits

Benefits paid to participants in the Combined Fund are charged to the Combined Fund. Separation benefits paid to individuals not participating in the Combined Fund are charged to (i) the Retirement Fund if the member's enrollment date is prior to February 1, 1996, and (ii) the Combined Fund if the member's enrollment date is on or after February 1, 1996.

Lump Sum Bonus Payments

Under the Global Pension Settlement, various lump sum bonus payments may be made to eligible individuals participating in the Combined Fund. An individual may be eligible for one or more types of lump sum bonus payments.

Eligibility for Lump Sum Bonus Payments

Only individuals participating in the Combined Fund can become eligible for the following types of lump sum bonus payments. In addition, the following conditions apply to the individual lump sum bonuses.

- a) 5% lump sum bonus: Members who are inactive as of January 1, 2000, will become eligible at the time that their deferred retirement allowance commences.

Members in active service as of January 1, 2000, will become eligible when they first retire.

If a member in active service as of January 1, 2000, dies prior to retirement and the member's surviving spouse is eligible for either a surviving spouse duty death benefit (including Heart & Lung duty death) or a PSO spouse survivor benefit then the surviving spouse is eligible for this bonus payment.

Only one 5% lump sum bonus will be paid on account of an individual member. Thus, if a member receiving a duty disability retirement allowance receives a 5% lump sum bonus on account of the duty disability benefit, then the member will not be eligible for an additional 5% lump sum bonus at the time of conversion.

- b) 8.6% lump sum bonus: A fireman or policeman in active service as of January 1, 2000, who (i) retires as a fireman or policeman on a service retirement allowance; or (ii) converts to service retirement or elects an extended life duty disability retirement allowance after retiring as a fireman or policeman on duty disability; (iii) attains age 63 while in receipt of an ordinary disability retirement allowance or a lifetime Fire & Police or Heart & Lung duty disability retirement allowance, is eligible for this bonus so long as the member did not receive 2 years of imputed service credit under the dissolution of the Firemen and Policemen's Survivorship Fund; (iv) or retires as a fireman or policeman on an extended life duty disability.

If a fireman or policeman in active service as of January 1, 2000, dies prior to retirement and the member's surviving spouse is eligible for either a surviving spouse duty death benefit (including Heart & Lung duty death) or a PSO spouse survivor benefit then the surviving spouse is eligible for this bonus payment.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

A fireman or policeman retired on disability as of January 1, 2000, who is also an active member of the Firemen and Policemen's Survivorship Fund as of January 1, 2000 - under age 57 at 1/1/2000, and made all required contributions to the Survivorship Fund – is eligible for this bonus if he (i) converts to service retirement or elects an extended life duty disability retirement allowance; or (ii) is ineligible to convert to service retirement and attains age 63 while in receipt of the disability retirement allowance; provided that he (iii) did not receive 2 years of imputed service credit under the dissolution of the Firemen and Policemen's Survivorship Fund.

Amount of Lump Sum Bonus Payments

Age factors are used in the 5% lump sum bonus and the 8.6% lump sum bonus calculations. The age factors for these bonus payments are contained in s. 36-05-11-a.

- a) 5% lump sum bonus: For members who are either inactive or active as of January 1, 2000, who retire in the future, the bonus payment equals 5% times their initial annual retirement allowance times a factor based on attained age on the retirement date. The retirement allowance used in the bonus calculation is to be reduced for early retirement, if applicable, but is not to be reduced for any optional election the member might have made under s. 36-05-7.

If a member in active service as of January 1, 2000 dies prior to retirement and the member's surviving spouse is eligible for this bonus payment, then the bonus will equal 5% times the spouse's initial annual benefit times a factor based on the spouse's attained age when the benefit commences.

- b) 8.6% lump sum bonus: In the explanation that follows, whenever an annual allowance is used in calculating a bonus due to a member, the allowance used is the allowance that would be paid if the member did not elect an option under s. 36-05-7.

For members who retire on service retirement: 8.6% times the annual service retirement allowance times a factor based on attained age at retirement.

For surviving spouses who receive either a PSO benefit or a duty death benefit: 8.6% times the initial annual allowance payable to the spouse times a factor based on the spouse's attained age when the benefit commences.

For a member who is retired on duty disability as of January 1, 2000 - or who retires on duty disability thereafter - and who is eligible to convert to service retirement: 8.6% times the annual conversion service retirement allowance earned as of the conversion age times a factor based on attained age at conversion.

For a member who is retired on disability as of January 1, 2000 – or who retired on disability thereafter – who is ineligible to convert to service retirement, and who is age 63 or younger at the later of 1/1/2000 or the disability retirement date: 8.6% times the “hypothetical” annual conversion service retirement allowance earned at age 63 times the attained age factor for age 63. The “hypothetical” allowance is calculated as if the member were eligible to convert at age 63.

For a member who retires on disability after January 1, 2000, who is older than age 63 at the disability retirement date: 8.6% times the annual disability allowance payable when the allowance commences times a factor based on the member's attained age at retirement.



APPENDIX B: SUMMARY OF BENEFIT PROVISIONS

Funds Charged

The 5% lump sum bonus and the 8.6% lump sum bonus are paid from the Combined Fund.

Benefits Not Valued

Best practice supports use of a three to five-year amortization period for amortization of liabilities generated by early retirement incentives such as the Bonus Year. While it is not clear whether a member retired due to an incentive, best practice would indicate that the additional liabilities generated by the Bonus Year should be amortized over a shorter period more in line with the period of payroll saving anticipated to be generated by the window. We recommend that the Bonus Year liabilities be isolated and amortized over a period not to exceed five years.



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Actuarial Methods

The method of financing the ERS is prescribed in Section 36.08 of the MCC.

Actuarial Cost Method

The method used to determine Normal Cost and Accrued Actuarial Liability (AAL) is the Individual Entry Age Normal Cost Method. The UAAL, under this method, is the AAL over the Actuarial Value of Assets. The total Employer contribution is the sum of the Employer portion of the Normal Cost (Total Normal Cost less expected member contributions) plus an amount to amortize the UAAL according to the Amortization Method.

If the Actuarial Value of Assets exceeds the sum of the AAL and the Employer portion of the Normal Cost, there is no Employer contribution required for that year.

Asset Values

Two asset values are used in this report. A description of each and a brief explanation of where they are used follows:

- **Market Value**

The market value of assets is the value of investments if they were to be sold on the date valued. The market value of assets is used to develop the actuarial value of assets.

- **Actuarial Value**

The actuarial value of the assets in the Employers' Reserve Fund and the Securities Lending Fund is equal to the market value of assets. These Funds are not available to pay the benefits for ERS members so they are excluded from the allocation of the actuarial value of assets to the various funds and groups and the resulting calculations of employer contributions. The actuarial value of assets for the remaining funds is a smoothed value of assets (see Table 8). The difference between (1) the expected return on the actuarial value of assets at the beginning of the year, based on the investment return assumption and the net non-investment cash flows, and (2) the actual return on the market value of assets is smoothed equally over five years. As a result, there are five components of excess/shortfall returns to be smoothed each year.

The preliminary actuarial value for the current valuation is the preliminary actuarial value from the prior year plus non-investment cash flows (contributions less benefits and refunds) plus the expected return on the market value of assets at the applicable assumed investment return and the current year's recognition of each of the prior five year's excess/shortfall returns.

Amortization Method

Closed layered amortization method with amortization payments for each base increasing by 2.00% per year. The outstanding balance of the unfunded actuarial accrued liability (UAAL) as of January 1, 2019 is amortized over a fixed 25-year period. At each subsequent valuation date, any changes to the UAAL arising from actuarial gains or losses will be amortized over a fixed 15-year period and any changes to the UAAL arising from changes in assumptions, methods, or plan provisions will be amortized over a fixed 25-year period.



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Assumptions are based on the experience investigation prepared as of December 31, 2016 and adopted by the Board of Trustees on October 23, 2017 for use beginning with the January 1, 2018 actuarial valuation. The investment return assumption of 7.50% was adopted by the Board of Trustees on April 29, 2019, for use in the January 1, 2019 actuarial valuation.

Investment Return Assumption: 7.50% per annum, compounded annually.

Inflation: 2.50% per annum.

Cost of Living Adjustments (COLA): For retirees whose COLA is defined as the lesser of 3.00% and CPI-U, the assumed COLA is 2.50% per annum.

Payroll Growth for UAAL amortization: UAAL amortization payments increase at 2.00% per annum.

Illustrative Rates of Salary Increase:

Age	Salary Increases	
	General Employees	Firemen and Policemen
25	4.93%	9.47%
30	3.79	7.72
35	3.78	5.78
40	2.89	4.68
45	2.50	4.28
50	2.50	4.08
55	2.50	4.00
60	2.50	4.00
65	2.50	4.00

Annual increases of 2.50% per annum is assumed for Policemen, Firemen and General Employees on duty disability. The increases for duty disabled Firemen and Policemen affect both current duty disability benefits and future service retirement or extended life conversion benefits. The increases for General Employees affect only service retirement conversion benefits.

Deaths After Retirement: For regular retirees and survivors, the RP-2014 Healthy Annuitant Mortality Table, using 111% of rates for males and 110% of rates for females, projected generationally using Scale MP-2016, was used. For duty and ordinary disability retirees, the RP-2014 Disability Mortality Table, using 102% of rates for males and 98% of rates for females, projected generationally using Scale MP-2016, was used.

Deaths Prior to Retirement: For death in active service, the RP-2014 Non-annuitant Mortality Table projected generationally with Scale MP-2016 was used.

Mortality Projection: All mortality rates are projected using generational improvement with Scale MP-2016.



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Illustrative Rates of Termination:

Age	<u>Less than 5 Years of Service</u>		<u>At least 5 Years of Service</u>	
	Males	Females	Males	Females
<u>General Employees</u>				
20	17.62%	24.05%	13.00%	14.30%
25	15.93	24.12	12.68	14.30
30	11.31	16.77	6.92	8.45
35	10.66	15.60	7.19	7.27
40	8.78	10.40	4.51	8.45
45	9.10	9.23	2.99	4.67
50	8.32	8.58	2.38	3.38
55	6.83	7.80	1.99	3.64
60	-	-	-	-
<u>Firemen and Policemen</u>				
20	6.15%	5.55%	-	-
25	2.33	4.65	1.34%	2.33%
30	2.75	7.38	1.13	3.34
35	3.38	6.63	1.10	1.88
40	4.40	4.40	0.90	0.97
45	5.40	4.40	1.08	1.53
50	8.80	4.40	4.05	6.70
55	10.00	4.40	-	-
60	-	-	-	-

All terminations are assumed to be involuntary.

Members who terminate vested are assumed to take a refund if it is more valuable than their deferred benefit. Regular interest credited on contribution account balances is assumed to be 4.0%.



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Illustrative Rates of Early and Normal Retirement:

Age	Early Retirement		Normal Retirement			
	General Employees	General Employees		Firemen All	Not in Combined Fund	Policemen In Combined Fund
		Males	Females			
42						10%
43						25
44						25
45						25
46						32
47						32
48				10%		32
49				13		25
50				13		25
51				13	44%	25
52				18	44	25
53				18	24	25
54		35%	26%	20	24	25
55	4%	45	26	25	24	25
56	4	30	17	25	40	25
57	4	27	15	30	35	25
58	4	27	20	35	35	25
59	4	22	20	35	35	25
60	4	19	19	35	35	25
61	4	19	20	50	35	25
62	4	28	25	50	50	50
63	4	20	18	100	100	100
64	4	20	18	100	100	100
65		30	25	100	100	100
66		30	30	100	100	100
67		18	20	100	100	100
68		18	20	100	100	100
69		18	20	100	100	100
70		100	100	100	100	100



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Illustrative Rates of Disability:

Age	Disability Rates		
	General Employees	Firemen	Policemen
20	0.050%	0.064%	0.030%
25	0.050	0.136	0.030
30	0.060	0.280	0.100
35	0.077	0.760	0.187
40	0.131	0.960	0.231
45	0.162	0.960	0.231
50	0.256	1.080	0.210
55	0.527	1.080	0.210
60	0.077	1.080	0.210
65	0.200	1.080	0.210

Elected officials are assumed to become disabled at the same rate as General Employees.

Duty Disabilities:

Employee Group	Percentage of Disabilities Incurred in the Performance of Duty	Percentage of Duty Disabilities Assumed		Assumption Adopted January 1
		Eligible For The 90% Benefit	Under The Heart & Lung Law	
General Employees	10.0%	N/A	N/A	2018
Police other than MPA	70.0%	5.0%	N/A	2018
MPA enrolled on or before 4/18/2005	70.0%	5.0%	N/A	2018
MPA enrolled after 4/18/2005	62.5%	7.5%	N/A	2008
Fire other than MPFFA	90.0%	5.0%	15.0%	2008
MPFFA enrolled on or before 10/3/2005	90.0%	5.0%	15.0%	2008
MPFFA enrolled after 10/3/2005	81.2%	6.9%	20.8%	2008

Upon reaching their service conversion date, 100% of Policemen and Firemen who become duty disabled are assumed to convert to a service retirement benefit.



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Marriage Assumption and Duty Disability Child Allotments:

It is assumed that female spouses are three years younger than males. In absence of evidence to the contrary, it is assumed that 85% of General Employees and 95% of Policemen and Firemen are married, with dependent children, described by the following table:

Member's Age at Death or Disability	Number of Dependent Children	Age of Youngest Child
20	0.0	-
25	1.5	1
30	2.5	2
35	2.5	5
40	2.5	8
45	2.0	11
50	1.5	14
55	1.0	15
60 and Over	0.0	-

The percentage of retiring employees assumed to elect option 3, the subsidized 50% option, is 25% for males and 15% for females. The percentage of General Employees assumed electing the 100% PSO option before retirement is 40% for males and 15% for females. For Firemen and Policemen, 95% are assumed to elect the 100% PSO option before retirement.

Duty Deaths:

The following percentages of deaths in active service are assumed to incur in the performance of duty:

General Employees: 5%
 Police & Fire: 10%. In addition, amongst firemen, 25% of duty deaths are assumed to occur under the Heart and Lung Law.

Imputed Military Service:

The following percentages of eligible members are assumed to earn 1 year of imputed military service credit:

General Employees: 10%
 Police: 13%
 Fire: 13%

These percentages are based on troop strength statistics from the Department of Defense website. (Adopted 1/1/2003)



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Seasonal Service Credit: The following percentages of eligible members are assumed to receive one year of reasonable service credit:

Member's Union or Bargaining Group	Percentage with Seasonal Service	Assumption Adopted January 1
District Council 48, AFSCME	27.09%	2005
Fire Equipment Dispatchers Local 494, IBEW	0.00%	2006
Electrical Group Local 494, IBEW	31.00%	2006
Machine Shop Local 494, IBEW	12.00%	2005
Bridge Operators Local 195, IBEW	28.57%	2005
Joint 129/48 Local 139, IOUE & DC48	100.00%	2005
Machinists Local 510, IAM	5.00%	2005
Sanitation Local 61, LIUNA	98.06%	2005
TEAM (Techs, Eng, Archs of Milw)	5.00%	2005
MBCTC (Bricklayers, Carpenters, Cement Masons, Painters, Iron Workers)	10.00%	2005
Police Sworn Management, Police Civilian Management, Managers, Elected Officials (except mayor)	3.13%	2005
Non-represented in the Police Department and General City non-represented	5.00%	2005

Miscellaneous

Future Service Accrual: For members active on the valuation date, credited service in each future year is assumed to be the greater of credited service earned in the year prior to the valuation, or the average of the three highest years of service credit out of the five years that preceded the valuation date. New hires are assumed to accrue a full year of service in each future year (adopted 1/1/2007).

Annualized Compensation: For active members, their prior year reported compensation amount is annualized based on their Future Service Accrual and further increased by a leap year adjustment factor of 1.0034 ($26.089285 \div 26$).

Deemed Inactives: Active members who worked less than 100 hours in the prior year, but who have not officially terminated employment are treated as Inactives. These members are not assumed to earn additional service credit in future years.

Decrement Timing: All withdrawals, deaths, disabilities, and retirements are assumed to occur mid-year.



APPENDIX C: SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

Liability for Inactive Members: The data provided for inactive members does not contain all the elements to calculate the member's deferred benefit. The deferred benefit amounts for these members are estimated using the member's life-to-date earnings and assumed salary increases. For terminated members who are missing a termination date on their record, it is assumed that they terminated at age 35. The actuary is collecting data so that future members' deferred benefits can be estimated.

Administrative Expenses: Based on the most recent fiscal year end.

Normal Cost: Normal cost rate reflects the impact of new entrants during the year

Changes Since Prior Valuation: The investment return assumption was changed from 8.00% for calendar years 2018 through 2022 and 8.25% beginning in 2023, to 7.50% for all years. For GASB purposes, the prior year investment return assumption was 8.24%. Note that assumptions that have been added to this section since the last valuation date are not new assumptions, but rather documentation of assumptions already being used.



APPENDIX D: GLOSSARY OF TERMS

Note that the first definitions given are the “official” definitions of the term. For some terms there is a second definition, in italics, which is the unofficial definition.

Actuarial Accrued Liability (AAL): The portion of the Present Value of Projected Benefits (PVFB) allocated to past service. Also difference between (i) the actuarial present value of future benefits, and (ii) the present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.” *The amount of money that should be in the fund. The funding target.*

Actuarial Assumptions: Estimates of future plan experience with respect to rates of mortality, disability, retirement, investment income and salary increases. Demographic (“people”) assumptions (rates of mortality, separation, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic (“money”) assumptions (salary increases and investment income) consist of an underlying rate appropriate in an inflation- free environment plus a provision for a long-term average rate of inflation. *Estimates of future events used to project what we know now- current member data, assets, and benefit provisions – into an estimate of future benefits.*

Actuarial Cost Method: A mathematical budgeting procedure for allocating the dollar amount of the Present Value of Projected Benefits (PVFB) between the normal costs to be paid in the future and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

Actuarial Methods: The collective term for the Actuarial Cost Method, the Amortization Payment for UAAL Method, and the Asset Valuation Method used to develop the contribution requirements for the Retirement System. *The funding policy.*

Actuarial Equivalent: Benefits whose actuarial present values are equal.

Actuarial Present Value: The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Actuarial Value of Assets (AVA): A smoothed value of assets which is used to limit contribution volatility. Also known as the funding value of assets. *Smoothed value of assets.*

Amortization Payment for UAAL: Payment of the unfunded actuarial accrued liability by means of periodic contributions of interest and principal, as opposed to a lump sum payment. The components of the amortization payment for UAAL includes:

- Amortization Period Length – Generally amortization periods of up to 15 to 25 years (and certainly not longer than 30). Similar to a mortgage, the shorter the amortization period, the higher the payment and the faster the UAAL is paid off.
- Amortization payment increases – Future payments can be level dollar, like a mortgage, or as a level percent of pay. Most Retirement Systems amortize UAAL as a level percent of pay which when combined with the employer normal cost that is developed as a level percent of pay can result in contributions that are easier to budget.



APPENDIX D: GLOSSARY OF TERMS

- Amortization type – An amortization schedule can be closed or open. A closed amortization schedule is similar to a mortgage – at the end of the amortization period the UAAL is designed to be paid off. An open amortization period is similar to refinancing the UAAL year after year.
- Amortization schedule – UAAL can be amortized over a single amortization period, or it can be amortized over a schedule.

The amortization payment for UAAL can be thought of as the UAAL mortgage payment.

Asset Valuation Method: The components of how the actuarial value of assets is to be developed. TSERS uses a five-year smoothing of asset gains and losses, which is the most commonly used method.

Experience Gain (Loss): A measure of the difference between actual experience and experience anticipated by a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. *The experience Gain (Loss) represents how much the actuary missed the mark in a given year.*

Funded Ratio: The percent of the actuarial accrued liabilities covered by the actuarial value of assets. Also known as the funded status. *The ratio of how much money you actually have in the fund to the amount you should have in the fund.*

Normal Cost: The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” An amortization payment toward the unfunded actuarial accrued liability is paid in addition to the normal cost to arrive at the total contribution in a given year. *The cost of benefits accruing during the year.*

Present Value of Future Normal Cost (PVFNC): The portion of the Present Value of Projected Benefits (PVFB) allocated to future service. *The value in today’s dollars of the amount of contribution to be made in the future for benefits accruing for members in the Retirement System as of the valuation date.*

Present Value of Future Benefits (PVFB): The projected future benefit payments of the plan are discounted into today’s dollars using an assumed rate of investment return assumption to determine the Present Value of Future Benefits (PVFB) of the Retirement System. The PVFB is the discounted value of the projected benefits promised to all members as of a valuation date, including future pay and service for members which has not yet been earned. *If the Retirement System held assets equal to the PVFB and all the assumptions were realized, there would be sufficient funds to pay off all the benefits to be paid in the future for members in the Retirement System as of the valuation date.*

Reserve Account: An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability (UAAL): The difference between the actuarial accrued liability (AAL) and actuarial value of assets (AVA). The UAAL is sometimes referred to as “unfunded accrued liability.” *Funding shortfall, or prefunded amount if negative.*

Valuation Date: The date that the actuarial valuation calculations are performed as of. *Also known as the “snapshot date”.*