



Macomb County Employees Retirement System

Actuarial Valuation Report

Plan Year January 1, 2019 – December 31, 2019

August 2020



August 2020

The Retirement Commission
Macomb County Employees Retirement System
Mount Clemens, Michigan

Ladies and Gentlemen:

Macomb County retained Buck to complete this actuarial valuation of the Macomb County Employees Retirement System. This report summarizes the actuarial valuation results of Macomb County Employees Retirement System as of December 31, 2019.

Purpose of This Report

Buck has prepared this report for Macomb County for use in review of the operation of the plan, including determining contributions to be made to the plan, and as a source of information for the financial statements of the plan. An actuarial valuation is performed on the retirement plan annually as of the beginning of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

1. To determine if the funding policy for the Retirement Plan is being met considering current assets and the current employer and member contribution rates; or determine the employer contribution necessary to meet the Commission's funding policy for the Plan;
2. To disclose the funding assets and liability measures as of the valuation date;
3. To review the current funded status of the Plan;
4. To compare actual and expected experience under the Plan during the last fiscal year;
5. And to report trends in contributions, assets, liabilities, and funded status over the last several years.

This actuarial valuation provides a "snapshot" of the funded position of the Retirement Plan based on the plan provisions, membership, assets, and actuarial assumptions as of the valuation date.

Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting its advance review of any statement, document, or filing to be based on information contained in this report. Buck will accept no liability for any such statement, document or filing made without its prior review.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. Because of limited scope, Buck performed no analysis of the potential range of such future differences.

Data Used

The actuarial valuation is based on unaudited financial and member data provided by the staff of the Retirement System and summarized in this report. The benefits considered are those delineated in the plan as amended and restated effective December 31, 2015. The actuary did not verify the data submitted but did perform tests for consistency and reasonableness.

Assumptions and Methods

All costs, liabilities and other factors under the Plan were determined in accordance with actuarial principles and procedures adopted in accordance with the Actuarial Standards of Practice (ASOPs). An actuarial cost method is used to measure the actuarial liabilities which we believe is reasonable. Buck is solely responsible for the actuarial data and actuarial results presented in this report. This report fully and fairly discloses the actuarial position of the Plan.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the Plan and reasonable long-term expectations, and represent our best estimate of the anticipated long-term experience under the Plan. The actuary performs an analysis of Plan experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Actuarial Certification

The undersigned is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all Applicable Actuarial Standards of Practice and he is available to answer any questions on the material contained in the report, or to provide explanations or further details as may be appropriate.

Respectfully submitted,

Buck Global, LLC (Buck)



Troy Jaros, FSA, EA, MAAA, FCA
Director, Retirement Actuary

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Summary of Results

Overview

The Macomb County Employees Retirement System provides pension and ancillary benefit payments to the terminated and retired employees of Macomb County, Michigan. A Retirement Commission comprised of employer, employee, and appointed representatives is responsible for administering the Plan and making investment decisions. This report presents the results of the actuarial valuation of the Employees Retirement System as of December 31, 2019.

Membership

Actives

As of December 31, 2019, there were 1,578 employees in active service covered under the provisions of the Plan not participating in DROP. The significant age, service, and salary information for these employees is summarized below, along with comparative figures from the last actuarial valuation one year earlier.

	December 31, 2019	December 31, 2018
Active participants		
Number	1,578	1,751
Average age	47.2 years	46.6 years
Average service	12.3 years	11.6 years
Total annual valuation salary	\$ 101,650,261	\$ 107,524,311
Average annual salary	\$ 64,417	\$ 61,407

The number of active members decreased by 9.9% from the previous valuation date as the plan is closed to the entrance of new members. The average age of the active members increased by 0.6 years and the average service increased 0.7 years. The total annual valuation salary decreased by 5.5% and the average salary increased by 4.9% from the previous valuation. There were 1,577 active members who were also reported active in the December 31, 2018 actuarial valuation. The total salary for this group increased by 4.92% which was higher than the 4.41% increase we expected for the group.

Distributions of active members by age, service, and salary are given in Section 3.2. The salaries shown for active members are the actual annualized salaries reported.

A schedule of active member data and reconciliation of the active membership from the previous year is shown in Sections 3.3 and 3.4.

In addition, there are 1,162 active employees (not included above) hired after December 31, 2015 earning vesting service to receive a \$1,000 lump sum benefit upon termination of employment.

Inactives

In addition to the active members, there were 566 inactive members who did not elect to receive their accumulated contributions when they left covered employment. The significant age and annual benefit information for these inactive members are summarized below with comparative figures from the last actuarial valuation one year earlier.

	December 31, 2019	December 31, 2018
Terminated vested participants		
Number	286	314
Average age	50.6 years	51.1 years
Average annual benefit payments	\$ 13,495	\$ 12,641

The number of inactive vested members decreased by 8.9% from the previous valuation. The average age of the inactive vested members decreased by 0.5 years. The Average Annual Pension Benefit for these members increased by 6.8% from the previous valuation.

	December 31, 2019	December 31, 2018
Non-vested participants owed refund		
Number	280	356
Average payoff amount	\$ 2,542	\$ 2,018

The number of inactive non-vested members decreased by 21.3% from the previous valuation. The Average Refund Due for these members increased by 26.0% from the previous valuation.

Distributions of inactive members by age and pension benefit are given in Section 3.6.

Retirees and Beneficiaries

In addition to the active and inactive members, there were 2,348 retired members and 370 beneficiaries who are receiving monthly benefit payments on the valuation date. The significant age and annual benefit information for these members are summarized below with comparative figures from the last actuarial valuation performed one year earlier.

	December 31, 2019	December 31, 2018
Retired participants		
Number	2,348	2,313
Average Age	69.6 years	69.3 years
Average annual retirement benefits	\$ 21,959	\$ 21,917

	December 31, 2019	December 31, 2018
Survivors and beneficiaries of participants		
Number	370	379
Average Age	72.3 years	72.7 years
Average annual retirement benefits	\$ 15,201	\$ 14,794

The number of retired members and beneficiaries increased by 1.0% from the previous valuation date. The average age of the retired members and beneficiaries increased by 0.2 years. The average annual benefit payments for these members increased by 0.6% from the previous valuation date.

Distributions of retired members by age and form of payment are given in Section 3.6 and 3.7.

DROP Participants

In addition to the actives, inactives, and retirees, there were 304 DROP members who are receiving monthly benefit payments on the valuation date. The significant age and annual benefit information for these members are summarized below.

	December 31, 2019	December 31, 2018
DROP participants		
Number	304	281
Average Age	58.2 years	58.4 years
Average annual retirement benefits	\$ 30,328	\$ 28,855
Average pay	\$ 62,575	\$ 59,443

In our opinion, the membership data collected and prepared for use in this actuarial valuation meets the data quality standards required under Actuarial Standards of Practice No. 23.

Plan Assets

The Plan's assets are held in trust and invested for the exclusive benefit of plan members. The trust is funded by member and employer contributions and pays benefits directly to eligible members in accordance with plan provisions. The assets are audited annually and are reported at fair value. On a fair value basis, the Plan has Net Assets Available for Benefits of \$1,082.0 million as of December 31, 2019. This includes an increase of \$144.9 million over the Net Assets Available for Benefits of \$937.1 million as of December 31, 2018. During the prior year, the fair value of assets experienced an investment rate of return of 21.22%.

In order to reduce the volatility investment gains and losses can have on the Plan's actuarially required contribution and funded status, the Commission has adopted a five-year smoothing method to determine the actuarial value of assets used for funding purposes. This method recognizes gains and losses, i.e. the difference between actual investment return during the year and the expected return based on the valuation interest rate, on a level basis over a five-year period. In our opinion, this method complies with Actuarial Standards of Practice No. 44.

As of December 31, 2019, the assets available for benefits on an actuarial value basis was \$1,022.6 million. This includes an increase of \$23.0 million over the actuarial value of assets of \$999.6 million as of December 31, 2018. During the prior year, the actuarial value of assets experienced an actuarial rate of return of 7.35%.

A summary of the assets held for investment, a summary of changes in assets, and the development of the actuarial value of assets is shown in Section 2.

Actuarial Experience

Differences between the expected experience based on the actuarial assumptions and the actual experience create changes in the actuarial accrued liability, actuarial value of assets, and the unfunded actuarial accrued liability from one year to the next. These changes create an actuarial gain if the experience is favorable and an actuarial loss if the experience is unfavorable. The Plan experienced a total net actuarial loss of \$1.1 million during the prior year. This total net loss is about 0.1% of the plan's prior year actuarial accrued liability.

The demographic experience tracks actual changes in the plan's population compared to the assumptions for decrements such as mortality, turnover, and retirement, as well as pay increases. The Plan experienced a demographic loss of \$3.7 million during the year ending December 31, 2019. This loss increased the unfunded actuarial accrued liability by \$3.7 million and decreased the funded ratio by 0.3%.

Continued tracking of the demographic experience is warranted in order to confirm the appropriateness of the actuarial assumptions. Details of the demographic, economic, and other assumptions used to value the plan liabilities and normal cost can be found in Section 6. In our opinion, the economic assumptions comply with Actuarial Standards of Practice No. 27 and the demographic assumptions comply with Actuarial Standards of Practice No. 35.

On the asset side, the Plan experienced a gain on an actuarial value of assets basis. The actual rate of return on the actuarial value of plan assets for the year ending December 31, 2019 was approximately 7.35% compared to the assumption of 7.00%, resulting in an asset gain of \$2.7 million. This gain decreased the unfunded actuarial accrued liability by \$2.7 million and increased the funded ratio by 0.3%.

The rate of return on the fair value of assets for the year ending December 31, 2019 was approximately 21.22%, which was higher than the assumed rate of 7.00%. The actuarial value of the assets recognizes only 1/5 of the 2019 gain on fair value, delaying the recognition of the remaining 4/5 over the next four years. Moreover, the actuarial value of assets also recognizes deferred portions of prior years' gains and losses on fair value. It should be noted that the plan's assumed asset return of 7.00% is a long-term rate and short-term performance is not necessarily indicative of expected long-term future returns.

A summary of the actuarial gains and losses experienced during the prior year is shown in Section 1.3.

Actuarial Contributions

Effective with the December 31, 2013 annual valuation, the Retirement Commission established a closed 20-year amortization policy assuming 5.00% payment increases. For this valuation, the remaining period is 14 years.

The normal cost represents the cost of the benefits that accrue during the year for active members under the Entry Age Normal Actuarial Cost Method. It is determined as a level percentage of pay which, if paid from entry age to the assumed retirement age, assuming all the actuarial assumptions are exactly met by plan experience would accumulate to a fund sufficient to pay all benefits provided by the Plan. The expected member contributions are subtracted from this amount to determine the employer normal cost. The employer normal cost for 2020 has been determined to be \$10.0 million or 9.88% of pay.

The cost method also determines the actuarial accrued liability which represents the value of all accumulated past normal cost payments. This amount is compared to the actuarial value of assets to determine if the Plan is ahead or behind in funding as of the valuation date. The difference between the total actuarial accrued liability and the actuarial value of assets equals the amount of unfunded actuarial accrued liability or surplus (if negative) on the valuation date. This amount is amortized and added to the employer normal cost to determine the annual actuarially required employer contribution for the year.

The unfunded actuarial accrued liability as of December 31, 2019 is \$32.1 million. This represents an decrease of \$2.6 million in the unfunded actuarial accrued liability from last year's amount of \$34.7 million.

The annual actuarially required employer contribution for 2021 is \$13.7 million, or 13.61% of pay. This represents a decrease of \$0.6 million in the employer contribution amount of \$14.3 million for 2020, or an increase of 0.26% of pay from last year's employer contribution rate of 13.35%.

The actuarial liabilities and development of the annual actuarial employer contribution is shown in Sections 1.1 and 1.2.

In our opinion, the measurement of the benefit obligations and determination of the actuarial cost of the Plan is performed in compliance with Actuarial Standards of Practice No. 4.

Funded Status

The funded status is a measure of the progress that has been made in funding the plan as of the valuation date. It is determined as a ratio of the actuarial value of assets divided by the total actuarial accrued liability on the valuation date. A ratio of over 100% represents a plan that is ahead in funding, and a ratio of less than 100% represents a plan that is behind in funding on the valuation date.

As of December 31, 2019, the funded ratio of the Plan is 97.0%. This represents an increase of 0.3% from last year's funded ratio of 96.7% as of December 31, 2018.

A history of the unfunded actuarial accrued liability and the funded ratio is shown in Section 1.5.

Changes in Plan Provisions

There have been no changes in benefits or other plan provisions considered in this actuarial valuation since the last valuation performed as of December 31, 2018.

Changes in Actuarial Assumptions, Methods, or Procedures

The actuarial assumptions and methods for funding purposes are the same as those used for the December 31, 2018 valuation report.

Comparative Summary of Key Actuarial Valuation Results

Actuarial Valuation as of

December 31, 2019

December 31, 2018

Summary of Member Data

Number of Members Included in the Valuation

Active Members	1,578	1,751
Terminated Vested Members	286	314
Non-vested Members Owed Refund	280	356
Retirees and Beneficiaries	2,718	2,692
DROP Participants	<u>304</u>	<u>281</u>
Total	5,166	5,394

Annual Payroll

Average (actual)	64,417	61,407
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Annual Benefit Payments

Terminated Vested Members (Average)	13,495	12,641
Non-vested Member Refund (Average)	2,542	2,018
Retirees and beneficiaries (Average)	21,036	20,916
DROP Participants (Average)	30,328	28,855

Summary of Assets

Fair Value	1,082,041,799	937,087,932
Rate of Return	21.22%	(5.88)%
Actuarial Value	1,022,559,084	999,604,207
Rate of Return	7.35%	5.08%

Summary of Liabilities

Total Actuarial Accrued Liability	1,054,636,606	1,034,282,157
Actuarial Value of Assets	1,022,559,084	999,604,207
Unfunded Actuarial Accrued Liability	32,077,522	34,677,950
Funded Ratio	96.96%	96.65%
Maturity Ratio (See section 1.2)	59.61%	60.31%

Section 1: Actuarial Funding Results

Section 1.1 - Actuarial Liabilities and Normal Cost

Actuarial Liabilities Based on December 31, 2019 Valuation	General County	Sheriff's Department	Road Commission	Martha T. Berry	Totals
1. Present Value of Projected Benefits					
Active Members					
Retirement Benefits	148,382,551	129,794,779	39,247,359	6,017,824	323,442,513
Withdrawal Benefits	18,370,401	4,398,203	803,008	1,764,319	25,335,931
Disability Benefits	11,605,810	4,569,365	1,441,097	673,197	18,289,469
Death Benefits	3,217,411	1,750,664	524,768	160,994	5,653,837
Return on Contributions	<u>1,694,565</u>	<u>364,546</u>	<u>159,631</u>	<u>181,718</u>	<u>2,400,460</u>
Total	183,270,738	140,877,557	42,175,863	8,798,052	375,122,210
2. Vested Inactive Members with Deferred Benefits	16,995,257	3,166,105	2,135,358	1,376,060	23,672,780
3. Non-Vested Inactive Members with Deferred Benefits	425,530	71,711	0	68,610	565,851
4. Retired Members and Beneficiaries Receiving Benefits	354,169,049	149,747,655	74,648,004	25,859,064	604,423,772
5. DROP Participants Receiving Benefits	79,524,668	36,395,127	30,700,017	1,473,342	148,093,154
6. Total Present Value of Projected Benefits (1 + 2 + 3 + 4 + 5)	634,385,242	330,258,155	149,659,242	37,575,128	1,151,877,767
7. Present Value of Future Normal Costs	<u>46,689,779</u>	<u>39,958,430</u>	<u>8,028,840</u>	<u>2,564,112</u>	<u>97,241,161</u>
8. Total Actuarial Accrued Liability (6 – 7)	587,695,463	290,299,725	141,630,402	35,011,016	1,054,636,606
Normal Cost for Fiscal Year Beginning December 31, 2019					
1. Total Normal Cost	6,845,875	4,824,950	1,244,415	378,701	13,293,941
2. Expected Member Contribution	<u>(1,654,278)</u>	<u>(1,231,438)</u>	<u>(316,070)</u>	<u>(116,666)</u>	<u>(3,318,452)</u>
3. Employer Normal Cost	5,191,597	3,593,512	928,345	262,035	9,975,489

Section 1.2 – Actuarial Contributions

	General County	Sheriff's Department	Road Commission	Martha T. Berry	Totals
1. Total Actuarial Accrued Liability					
a. Active Members					
i. Retirement Benefits	115,016,724	95,100,812	32,373,558	4,396,416	246,887,510
ii. Withdrawal Benefits	11,809,209	2,167,439	472,893	1,255,717	15,705,258
iii. Death Benefits	2,130,535	1,034,208	349,849	107,824	3,622,416
iv. Disability Benefits	7,142,843	2,570,693	913,173	427,812	11,054,521
v. Return on Employee Contributions	481,648	45,975	37,550	46,171	611,344
vi. Total	136,580,959	100,919,127	34,147,023	6,233,940	277,881,049
b. Vested Inactive Members with Deferred Benefits	16,995,257	3,166,105	2,135,358	1,376,060	23,672,780
c. Non-Vested Inactive Members with Deferred Benefits	425,530	71,711	0	68,610	565,851
d. Retired Members and Beneficiaries Receiving Benefits	354,169,049	149,747,655	74,648,004	25,859,064	604,423,772
e. DROP Participants Receiving Benefits	79,524,668	36,395,127	30,700,017	1,473,342	148,093,154
f. Total (1.a.vi. + 1.b. + 1.c. + 1.d. + 1.e.)	587,695,463	290,299,725	141,630,402	35,011,016	1,054,636,606
2. Actuarial Value of Assets	581,601,646	274,170,992	126,265,658	40,520,788	1,022,559,084
3. Unfunded Actuarial Accrued Liability (UAAL) (1.f. -2.)	6,093,817	16,128,733	15,364,744	(5,509,772)	32,077,522
4. Funded Ratio (2. / 1.f.)	98.96%	94.44%	89.15%	115.74%	96.96%
5. Maturity Ratio [(1.b. + 1.c. + 1.d.) / 1.f.]	63.23%	52.70%	54.21%	77.99%	59.61%
6. Employer Contribution for Fiscal 2021					
Total Normal Cost	6,845,875	4,824,950	1,244,415	378,701	13,293,941
Member Contribution	(1,654,278)	(1,231,438)	(316,070)	(116,666)	(3,318,452)
Administrative Expense	419,903	195,656	91,080	29,703	736,342
UAAL Contribution	490,648	1,298,616	1,237,103	(443,623)	2,582,744
Timing Adjustment	198,879	171,224	75,791	(6,356)	439,538
Total Employer Contribution Dollar (Not less than 0)	6,301,027	5,259,008	2,332,319	0	13,892,354 ¹
Projected Member Pay	59,196,674	27,934,345	9,381,281	4,436,026	100,948,326
Total Employer Contribution (% of Pay)	10.64%	18.83%	24.86%	0.00%	13.76%
7. Discount Rate	7.00%	7.00%	7.00%	7.00%	
8. Amortization payments increase assumption	5.00%	5.00%	5.00%	5.00%	
9. Amortization period for 2021 contribution ²	14	14	14	14	

¹ Total employer contribution is a sum of the individual employer amounts and does not add up to the items above because one group is capped at \$0 rather than negative

² Closed 20-year period beginning with December 31, 2013 Valuation

Section 1.3 - Actuarial (Gain) / Loss (\$'s in 000's)

	General County	Sheriff's Department	Road Commission	Martha T. Berry	Totals¹
1. Total Actuarial Accrued Liability					
a. Actuarial Accrued Liability at December 31, 2018	580,475	281,082	137,488	35,237	1,034,282
b. Normal Cost at December 31, 2018	7,212	5,026	1,296	457	13,991
c. Interest on a. + b. to End of Year	41,138	20,028	9,715	2,499	73,380
d. Benefit Payments and Refund of Contributions with Interest to End of Year	42,051	16,381	9,293	3,038	70,763
e. Effect of Assumption and Plan Changes	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
f. Expected Actuarial Accrued Liability (a. + b. + c. – d. + e.)	586,774	289,755	139,206	35,155	1,050,890
2. Actuarial Accrued Liability at December 31, 2019	<u>587,695</u>	<u>290,300</u>	<u>141,630</u>	<u>35,011</u>	<u>1,054,636</u>
3. Liability (Gain) / Loss (2. – 1.f.)	921	545	2,424	(144)	3,746
4. Expected Actuarial Value of Assets					
a. Actuarial Value of Assets at December 31, 2018	570,029	265,608	123,644	40,324	999,604
b. Interest on a. to End of Year	39,902	18,593	8,655	2,823	69,973
c. Contribution Made	11,779	5,443	2,829	295	20,346
d. Interest on c. to End of Year	412	191	99	10	712
e. Benefit Payments and Refund of Contributions with Interest to End of Year	<u>42,051</u>	<u>16,381</u>	<u>9,293</u>	<u>3,038</u>	<u>70,763</u>
f. Expected Actuarial Value of Assets at December 31, 2019 (a. + b. + c. + d. – e.)	580,071	273,454	125,934	40,414	1,019,872
5. Actuarial Value of Assets as of December 31, 2019	<u>581,602</u>	<u>274,171</u>	<u>126,266</u>	<u>40,521</u>	<u>1,022,560</u>
6. Actuarial Asset (Gain) / Loss (4.f. -5.)	(1,531)	(717)	(332)	(107)	(2,688)
7. Actuarial (Gain) / Loss (3. + 6.)	(610)	(172)	2,092	(251)	1,058

¹ Numbers may not add due to rounding.

Section 1.4 - Actuarial Balance Sheet

Financial Resources	December 31, 2019
1. Actuarial Value of Assets	1,022,559,084
2. Present Value of Future Contributions	
a. Expected Member Contributions	23,607,143
b. Employer Normal Cost	73,634,018
c. State Appropriations	<u>0</u>
d. Total	97,241,161
3. Unfunded Actuarial Accrued Liability/(Reserve)	32,077,522
4. Total Assets [1. + 2.(d) + 3.]	1,151,877,767

Benefit Obligations	December 31, 2019
1. Present Value of Future Benefits	
a. Active members	375,122,210
b. Inactive members	24,238,631
c. Retirees, disabilities and beneficiaries	604,423,772
d. DROP members	<u>148,093,154</u>
e. Total	1,151,877,767

Section 1.5 - History of UAAL and Funded Ratio (\$'s in 000's)

Valuation Date	Actuarial Value of Assets (AVA) (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded Actuarial Accrued Liability (UAAL) (b-a)	Funded Ratio (AVA as a % of AAL) (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (b-a)/(c)
December 31, 2008	855,266	805,888	(49,377)	106.1%	121,823	(40.5)%
December 31, 2009	866,357	814,564	(51,793)	106.4%	116,523	(44.4)%
December 31, 2010	862,916	837,168	(25,748)	103.1%	110,795	(23.2)%
December 31, 2011	828,692	854,324	25,632	97.0%	108,900	23.5%
December 31, 2012	795,606	867,219	71,613	91.7%	105,392	67.9%
December 31, 2013	837,653	884,042	46,389	94.8%	102,253	45.4%
December 31, 2014	882,565	911,096	28,531	96.9%	110,159	25.9%
December 31, 2015	902,931	977,566	74,636	92.4%	110,558	67.5%
December 31, 2016	940,494	1,019,138	78,644	92.3%	122,480	64.2%
December 31, 2017	990,803	1,013,110	22,307	97.8%	112,878	19.8%
December 31, 2018	999,604	1,034,282	34,678	96.6%	107,524	32.3%
December 31, 2019	1,022,559	1,054,637	32,078	97.0%	101,650	31.6%

Section 1.6 - Solvency Test (\$'s in 000's)

Valuation Date	Aggregate Accrued Liability For			Valuation Assets	Portion of Accrued Liabilities Covered by Assets		
	(1) Active Member Contributions	(2) Inactive Members	(3) Active Members (Employer- Financed Portion)		(1)	(2)	(3)
December 31, 2013	45,727	627,384	210,931	837,653	100.00%	100.00%	78.01%
December 31, 2014	46,460	640,125	224,511	882,565	100.00%	100.00%	87.29%
December 31, 2015	41,678	709,409	226,479	902,931	100.00%	100.00%	67.05%
December 31, 2016	42,682	723,523	252,933	940,494	100.00%	100.00%	68.91%
December 31, 2017	42,985	737,059	233,066	990,803	100.00%	100.00%	90.43%
December 31, 2018	45,787	755,475	233,020	999,604	100.00%	100.00%	85.12%
December 31, 2019	48,311	776,756	229,570	1,022,559	100.00%	100.00%	86.03%

Section 2: Plan Assets

Section 2.1 - Summary of Fair Value of Assets

Asset Category	Fair Value as of December 31, 2019		Fair Value as of December 31, 2018	
	Amount	%	Amount	%
1. Cash and Short-Term Investments				
a. Cash and cash equivalents	65,068,650	5.98%	77,592,945	8.23%
b. Other short-term	<u>3,403</u>	<u>0.00%</u>	<u>1,750</u>	<u>0.00%</u>
c. Total	65,072,053	5.98%	77,594,695	8.23%
2. Investments at Fair Value				
a. U.S. Treasury and agencies	0	0.00%	0	0.00%
b. Fixed Income	66,529,144	6.11%	62,004,730	6.57%
c. Domestic Stocks and Equity	642,608,631	59.05%	547,261,130	58.03%
d. International Equity	84,556,480	7.77%	69,935,791	7.41%
e. Limited Partnership	<u>229,544,368</u>	<u>21.09%</u>	<u>186,418,220</u>	<u>19.76%</u>
f. Total	1,023,238,623	94.02%	865,619,871	91.77%
3. Other Assets	0	0.00%	0	0.00%
4. Total Assets (1.c. + 2.f. + 3.)	1,088,310,676	100.00%	943,214,566	100.00%
5. Receivables				
a. Interest and Dividends	465,027		514,914	
b. Investments Sold	0		0	
c. Other Receivables	<u>493,339</u>		<u>845,939</u>	
d. Total	958,366		1,360,853	
6. Payables				
a. Payable for Investments Purchased	0		0	
b. Securities Lending Obligation in Excess of Collateral	0		0	
c. Accounts Payable and Accrued Liabilities	<u>7,227,243</u>		<u>7,487,487</u>	
d. Total	7,227,243		7,487,487	
7. Net Assets for Pension [4. + 5.d. – 6.d.]	1,082,041,799		937,087,932	

Section 2.2 - Changes in Fair Value of Assets

Transactions	December 31, 2019	December 31, 2018
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Additions

1. Contributions		
a. Contributions from Employers	17,144,386	23,747,047
b. Contributions from Plan Members	<u>3,201,757</u>	<u>3,252,673</u>
c. Total	20,346,143	26,999,720
2. Net Investment Income		
a. Interest and Dividends	8,854,062	8,397,859
b. Net Appreciation(Depreciation)	192,134,982	(61,642,515)
c. Rental Income	0	0
d. Net Securities Lending Income	0	0
e. Securities Lending Unrealized Gain/(Loss)	0	0
f. Miscellaneous	<u>0</u>	<u>0</u>
g. Total	200,989,044	(53,244,656)
h. Investment Expense	<u>(7,296,158)</u>	<u>(6,569,384)</u>
i. Net Investment Income	193,692,886	(59,814,040)
3. Total Additions	214,039,029	(32,814,320)

Deductions

4. Benefit Payments and Refunds		
a. Retirement Benefits	67,917,452	66,297,751
b. Refund of Contributions	452,815	461,792
c. Death	0	0
d. Supplemental Payment	0	0
e. Administrative Expenses	<u>714,895</u>	<u>711,070</u>
f. Total Deductions	69,085,162	67,470,613
5. Net Increase	144,953,867	(100,284,933)
6. Net Assets Held in Trust for Pension Benefits		
a. Beginning of Year	937,087,932	1,037,372,865
b. End of Year	1,082,041,799	937,087,932

Section 2.3 - Actuarial Value of Assets (cont'd)

Allocation of Retirement Systems Assets

	General County	Sheriff's Department	Road Commission	Martha T. Berry	Total
1. Valuation assets at start of year	570,029,318	265,607,709	123,643,676	40,323,504	999,604,207
2. Employee contributions	1,650,288	1,122,357	328,857	100,255	3,201,757
3. Employer contributions	10,129,157	4,320,231	2,500,000	194,998	17,144,386
4. Benefits paid	40,307,923	15,776,896	8,962,345	2,870,288	67,917,452
5. Refund of contributions	321,513	49,798	16,403	65,101	452,815
6. Administrative expense allocated on BOY asset value	<u>407,673</u>	<u>189,957</u>	<u>88,427</u>	<u>28,838</u>	<u>714,895</u>
7. Average valuation assets [1. + 0.5 * {2. + 3. - 4. - 5. - 6.}]	555,400,486	260,320,678	120,524,517	38,989,017	975,234,698
8. Investment income allocated on average valuation assets	40,829,992	19,137,346	8,860,300	2,866,258	71,693,896
9. Transfer in	0	0	0	0	0
Transfer out	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Net transfer of assets	0	0	0	0	0
10. Valuation assets at end of year [1. + 2. +3. - 4. - 5. - 6. + 8. + 9.]	581,601,646	274,170,992	126,265,658	40,520,788	1,022,559,084
11. Total Revenues [2. +3. + 8.]	52,609,437	24,579,934	11,689,157	3,161,511	92,040,039
Percentage of revenue attributable to:					
Employee contributions	3.1%	4.6%	2.8%	3.2%	3.5%
Employer contributions	19.3%	17.6%	21.4%	6.2%	18.6%
Investment income	77.6%	77.8%	75.8%	90.6%	77.9%
12. Total Expenditures [4. + 5. + 6.]	41,037,109	16,016,651	9,067,175	2,964,227	69,085,162
Percentage of expenditures attributable to:					
Benefits paid	98.2%	98.5%	98.8%	96.8%	98.3%
Refund of contributions	0.8%	0.3%	0.2%	2.2%	0.7%
Administrative expenses	1.0%	1.2%	1.0%	1.0%	1.0%

Section 2.4 - Historical Asset Rate of Return

Year Ending December 31	Actuarial Value of Assets	Market Value of Assets
2012	0.11%	11.51%
2013	10.55%	20.90%
2014	9.47%	7.22%
2015	6.86%	(1.73)%
2016	8.74%	9.58%
2017	10.01%	16.56%
2018	5.08%	(5.88)%
2019	7.35%	21.22%

Section 2.5 - Forecast of Expected Benefit Payments (\$000)

Year Ending December 31	Active Employees	Retired Members, Disabled Members and Beneficiaries	DROP Participants	Grand Total
2020	658	57,979	29,600	88,237
2021	1,328	56,767	9,434	67,529
2022	2,166	56,060	10,562	68,788
2023	3,049	55,483	14,641	73,173
2024	9,842	54,701	13,521	78,064
2025	13,545	53,929	9,137	76,611
2026	16,773	53,077	9,114	78,964
2027	19,349	52,120	9,088	80,557
2028	23,696	51,065	9,047	83,808
2029	24,902	49,989	9,007	83,898
2030	28,421	48,913	8,951	86,285
2031	32,232	47,855	8,892	88,979
2032	37,619	46,714	8,837	93,170
2033	37,546	45,534	8,769	91,849
2034	39,187	44,333	8,702	92,222
2035	42,295	43,085	8,627	94,007
2036	42,768	41,629	8,545	92,942
2037	44,534	40,168	8,453	93,155
2038	45,645	38,541	8,352	92,538
2039	46,944	36,912	8,240	92,096
2040	48,835	35,182	8,116	92,133
2041	52,211	33,459	7,979	93,649
2042	55,762	31,742	7,827	95,331
2043	55,813	29,933	7,660	93,406
2044	54,582	28,145	7,477	90,204
2045	54,236	26,369	7,276	87,881
2046	53,637	24,588	7,058	85,283
2047	52,915	22,820	6,821	82,556
2048	52,188	21,087	6,567	79,842
2049	51,311	19,413	6,295	77,019
2050	50,296	17,778	6,007	74,081

Section 2.6 – Retiree Reserve Balances

The liabilities for all divisions are greater than the reported assets allocated to the retiree reserve balances as of December 31, 2019. The liabilities and reserves are shown below:

	General County	Sheriff's Department	Road Commission	Martha T. Berry	Total
1. Retiree Liability	433,693,717	186,142,782	105,348,021	27,332,406	752,516,926
2. Retiree Reserve	<u>417,914,295</u>	<u>174,358,179</u>	<u>98,107,972</u>	<u>26,332,691</u>	<u>716,713,137</u>
3. Shortfall	15,779,422	11,784,603	7,240,049	999,715	35,803,789

Reserve Accounts	Amount
1. Member Contributions	48,310,587
2. Reserve for benefits now paid	716,713,137
3. Reserve for future benefits	317,018,075
4. Supplemental reserve	<u>0</u>
5. Total	1,082,041,799

Section 3: Member Data

Section 3.1 - Summary of Members Included

As of December 31	General County		Sheriff's Department		Road Commission		Martha T. Berry		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
<u>Active Members</u>										
1. Number	1,021	1,130	333	360	134	150	90	111	1,578	1,751
2. Average Age	49.1	48.4	42.0	41.4	46.2	46.0	46.5	45.6	47.2	46.6
3. Avg. Credited Service	11.6	10.9	14.3	13.6	15.9	15.7	8.6	7.7	12.3	11.6
4. Avg. Annual Earnings	56,325	53,809	79,956	76,581	68,656	64,048	47,300	45,252	61,844	58,825
5. Total Annual Earnings	57,507,766	60,803,836	26,625,297	27,569,044	9,199,857	9,607,130	4,257,005	5,022,962	97,589,925	103,002,972
<u>Active Members (Term. Benefit Only)</u>										
1. Number	767	718	133	103	52	43	210	274	1,162	1,138
<u>Retirees, Disabled and Beneficiaries</u>										
1. Number	1,897	1,869	342	339	290	295	189	189	2,718	2,692
2. Average Age	70.7	70.4	64.7	64.4	70.6	70.6	71.4	71.5	70.0	69.8
3. Avg. Monthly Benefit	1,514	1,502	3,168	3,170	2,053	2,044	1,130	1,099	1,753	1,743
<u>DROP Participants</u>										
1. Number	197	195	44	33	59	47	4	6	304	281
2. Average Age	59.4	59.5	54.3	54.8	57.2	56.6	55.2	58.0	58.2	58.4
3. Avg. Monthly Benefit	2,086	2,053	4,274	4,088	2,734	2,773	1,974	1,691	2,527	2,405
<u>Vested Terminated</u>										
1. Number	225	245	21	24	22	25	18	20	286	314
2. Average Age	50.6	50.6	50.0	53.9	49.5	51.5	52.2	53.2	50.6	51.1
3. Avg. Monthly Benefit	1,036	947	1,945	1,955	1,480	1,461	840	771	1,125	1,053
<u>Non-Vested with Refund</u>										
1. Number	186	232	22	26	-	2	72	96	280	356
2. Average Payoff	2,951	2,624	3,872	920	-	6,870	1,081	751	2,542	2,018
Total	4,293	4,389	895	885	557	562	583	696	6,328	6,532

Section 3.2 - Age and Service Distribution of Active Members as of December 31, 2019 – Total

Attained Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
15-19	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
20-24	Number	1	0	0	0	0	0	0	0	1
	Total Salary									\$60,201
	Average Salary									\$60,201
25-29	Number	33	28	0	0	0	0	0	0	61
	Total Salary									\$3,723,100
	Average Salary									\$61,034
30-34	Number	41	69	14	0	0	0	0	0	124
	Total Salary									\$7,441,444
	Average Salary									\$60,012
35-39	Number	37	62	39	47	1	0	0	0	186
	Total Salary									\$12,125,898
	Average Salary									\$65,193
40-44	Number	26	64	50	83	37	0	0	0	260
	Total Salary									\$16,888,401
	Average Salary									\$64,955
45-49	Number	21	45	61	84	100	19	1	1	332
	Total Salary									\$21,725,957
	Average Salary									\$65,440
50-54	Number	17	68	56	72	50	16	1	1	281
	Total Salary									\$17,435,658
	Average Salary									\$62,049
55-59	Number	18	39	52	60	12	7	2	0	190
	Total Salary									\$10,781,403
	Average Salary									\$56,744
60-64	Number	19	36	15	17	7	4	0	1	99
	Total Salary									\$5,502,372
	Average Salary									\$55,580
65-69	Number	6	10	8	5	1	0	0	0	30
	Total Salary									\$1,338,378
	Average Salary									\$44,613
70+	Number	2	0	5	3	2	1	0	1	14
	Total Salary									\$567,115
	Average Salary									\$40,508
TOTAL	Number	221	421	300	371	210	47	4	4	1,578
	Total Salary	\$11,278,850	\$25,318,970	\$18,054,004	\$24,034,550	\$15,286,559	\$3,067,384	\$206,431	\$343,176	\$97,589,925
	Average Salary	\$51,036	\$60,140	\$60,180	\$64,783	\$72,793	\$65,263	\$51,608	\$85,794	\$61,844

Section 3.2 - Age and Service Distribution of Active Members as of December 31, 2019 – General County (continued)

Attained Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
15-19	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
20-24	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
25-29	Number	11	5	0	0	0	0	0	0	16
	Total Salary									\$690,950
	Average Salary									\$43,184
30-34	Number	32	33	7	0	0	0	0	0	72
	Total Salary									\$3,842,000
	Average Salary									\$53,361
35-39	Number	21	39	20	14	0	0	0	0	94
	Total Salary									\$5,527,688
	Average Salary									\$58,805
40-44	Number	17	55	38	39	14	0	0	0	163
	Total Salary									\$9,626,418
	Average Salary									\$59,058
45-49	Number	14	38	41	51	38	6	1	0	189
	Total Salary									\$10,985,589
	Average Salary									\$58,125
50-54	Number	14	57	48	54	21	11	1	1	207
	Total Salary									\$12,101,775
	Average Salary									\$58,463
55-59	Number	14	31	46	45	10	6	1	0	153
	Total Salary									\$8,401,566
	Average Salary									\$54,912
60-64	Number	14	31	14	17	5	4	0	1	86
	Total Salary									\$4,669,331
	Average Salary									\$54,295
65-69	Number	5	9	7	5	1	0	0	0	27
	Total Salary									\$1,095,333
	Average Salary									\$40,568
70+	Number	2	0	5	3	2	1	0	1	14
	Total Salary									\$567,115
	Average Salary									\$40,508
TOTAL	Number	144	298	226	228	91	28	3	3	1,021
	Total Salary	\$6,967,152	\$16,657,257	\$12,851,659	\$13,371,431	\$5,561,341	\$1,713,242	\$141,177	\$244,507	\$57,507,766
	Average Salary	\$48,383	\$55,897	\$56,866	\$58,647	\$61,114	\$61,187	\$47,059	\$81,502	\$56,325

Section 3.2 - Age and Service Distribution of Active Members as of December 31, 2019 – Sheriff’s Department (continued)

Attained Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
15-19	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
20-24	Number	1	0	0	0	0	0	0	0	1
	Total Salary									\$60,201
	Average Salary									\$60,201
25-29	Number	15	19	0	0	0	0	0	0	34
	Total Salary									\$2,506,081
	Average Salary									\$73,708
30-34	Number	4	34	5	0	0	0	0	0	43
	Total Salary									\$3,164,685
	Average Salary									\$73,597
35-39	Number	5	16	15	20	0	0	0	0	56
	Total Salary									\$4,503,749
	Average Salary									\$80,424
40-44	Number	3	2	6	33	14	0	0	0	58
	Total Salary									\$4,879,104
	Average Salary									\$84,122
45-49	Number	3	3	13	17	43	2	0	1	82
	Total Salary									\$6,849,015
	Average Salary									\$83,525
50-54	Number	0	1	5	8	24	2	0	0	40
	Total Salary									\$3,248,798
	Average Salary									\$81,220
55-59	Number	0	1	2	11	1	1	0	0	16
	Total Salary									\$1,196,076
	Average Salary									\$74,755
60-64	Number	1	0	1	0	1	0	0	0	3
	Total Salary									\$217,590
	Average Salary									\$72,530
65-69	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
70+	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
TOTAL	Number	32	76	47	89	83	5	0	1	333
	Total Salary	\$2,114,107	\$5,894,470	\$3,555,486	\$7,364,740	\$7,233,656	\$364,169	\$0	\$98,669	\$26,625,297
	Average Salary	\$66,066	\$77,559	\$75,649	\$82,750	\$87,152	\$72,834	\$0	\$98,669	\$79,956

Section 3.2 - Age and Service Distribution of Active Members as of December 31, 2019 – Road Commission (continued)

Attained Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
15-19	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
20-24	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
25-29	Number	3	2	0	0	0	0	0	0	5
	Total Salary									\$271,402
	Average Salary									\$54,280
30-34	Number	0	1	2	0	0	0	0	0	3
	Total Salary									\$178,836
	Average Salary									\$59,612
35-39	Number	3	4	2	12	1	0	0	0	22
	Total Salary									\$1,421,744
	Average Salary									\$64,625
40-44	Number	1	4	3	7	9	0	0	0	24
	Total Salary									\$1,652,563
	Average Salary									\$68,857
45-49	Number	0	3	3	12	17	10	0	0	45
	Total Salary									\$3,166,176
	Average Salary									\$70,359
50-54	Number	0	5	2	5	5	3	0	0	20
	Total Salary									\$1,463,338
	Average Salary									\$73,167
55-59	Number	1	4	2	3	1	0	1	0	12
	Total Salary									\$753,539
	Average Salary									\$62,795
60-64	Number	0	1	0	0	1	0	0	0	2
	Total Salary									\$184,600
	Average Salary									\$92,300
65-69	Number	0	0	1	0	0	0	0	0	1
	Total Salary									\$107,657
	Average Salary									\$107,657
70+	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
TOTAL	Number	8	24	15	39	34	13	1	0	134
	Total Salary	\$446,008	\$1,603,491	\$1,067,498	\$2,657,374	\$2,409,937	\$950,294	\$65,255	\$0	\$9,199,857
	Average Salary	\$55,751	\$66,812	\$71,167	\$68,138	\$70,880	\$73,100	\$65,255	\$0	\$68,656

Section 3.2 - Age and Service Distribution of Active Members as of December 31, 2019 – Martha T. Berry (continued)

Attained Age		0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	Total
15-19	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
20-24	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
25-29	Number	4	2	0	0	0	0	0	0	6
	Total Salary									\$254,666
	Average Salary									\$42,444
30-34	Number	5	1	0	0	0	0	0	0	6
	Total Salary									\$255,923
	Average Salary									\$42,654
35-39	Number	8	3	2	1	0	0	0	0	14
	Total Salary									\$672,716
	Average Salary									\$48,051
40-44	Number	5	3	3	4	0	0	0	0	15
	Total Salary									\$730,316
	Average Salary									\$48,688
45-49	Number	4	1	4	4	2	1	0	0	16
	Total Salary									\$725,176
	Average Salary									\$45,324
50-54	Number	3	5	1	5	0	0	0	0	14
	Total Salary									\$621,747
	Average Salary									\$44,410
55-59	Number	3	3	2	1	0	0	0	0	9
	Total Salary									\$430,222
	Average Salary									\$47,802
60-64	Number	4	4	0	0	0	0	0	0	8
	Total Salary									\$430,851
	Average Salary									\$53,856
65-69	Number	1	1	0	0	0	0	0	0	2
	Total Salary									\$135,387
	Average Salary									\$67,694
70+	Number	0	0	0	0	0	0	0	0	0
	Total Salary									\$0
	Average Salary									\$0
TOTAL	Number	37	23	12	15	2	1	0	0	90
	Total Salary	\$1,751,583	\$1,163,753	\$579,361	\$641,004	\$81,624	\$39,679	\$0	\$0	\$4,257,005
	Average Salary	\$47,340	\$50,598	\$48,280	\$42,734	\$40,812	\$39,679	\$0	\$0	\$47,300

Section 3.3 - Member Data Reconciliation

	Inactive Members							
	Active ¹	Deferred Benefits	Termination Owed Refund	DROP	Retired Members	Disabled Members	Beneficiaries	Total
As of December 31, 2018	1,751	314	356	281	2,222	91	379	5,394
Changes due to:								
Age/Service Retirements	(19)	(34)	0	(42)	91	0	4	0
Disability Retirements	0	0	0	0	0	0	0	0
Deaths Without Beneficiary	0	0	0	(1)	(40)	(1)	(31)	(73)
Deaths With Beneficiary	(2)	0	0	0	(12)	(3)	20	3
Non-Vested Terminations	(8)	0	0	0	0	0	0	(8)
Terminations Owed Refund	(14)	(9)	23	0	0	0	0	0
Vested Terminations	(25)	25	0	0	0	0	0	0
Rehires	1	(1)	0	0	0	0	0	0
Cash-Outs	(37)	(9)	(97)	0	0	0	0	(143)
Expiration of Benefits	0	0	0	0	0	0	(2)	(2)
Data Corrections	(3)	0	(2)	0	0	0	0	(5)
Transfers Out	0	0	0	0	0	0	0	0
DROP	(66)	0	0	66	0	0	0	0
New Entrants	0	0	0	0	0	0	0	0
Net Change	(173)	(28)	(76)	23	39	(4)	(9)	(228)
As of December 31, 2019	1,578	286	280	304	2,261	87	370	5,166

¹ The count as of 12/31/2019 excludes 1,162 active participants who are eligible for Termination Benefit Only

Section 3.3 - Member Data Reconciliation – General County

	Inactive Members							
	Active	Deferred Benefits	Termination Owed Refund	DROP	Retired Members	Disabled Members	Beneficiaries	Total
As of December 31, 2018	1,130	245	232	195	1,595	41	233	3,671
Changes due to:								
Age/Service Retirements	(11)	(22)	0	(35)	67	0	1	0
Disability Retirements	0	0	0	0	0	0	0	0
Deaths Without Beneficiary	0	0	0	(1)	(22)	(1)	(18)	(42)
Deaths With Beneficiary	(2)	0	0	0	(6)	(1)	10	1
Non-Vested Terminations	(4)	0	0	0	0	0	0	(4)
Terminations Owed Refund	(9)	(9)	18	0	0	0	0	0
Vested Terminations	(18)	18	0	0	0	0	0	0
Rehires	1	(1)	0	0	0	0	0	0
Cash-Outs	(26)	(6)	(63)	0	0	0	0	(95)
Expiration of Benefits	0	0	0	0	0	0	(2)	(2)
Data Corrections	(2)	0	(3)	0	0	0	0	(5)
Transfers Out	0	0	2	0	0	0	0	2
DROP	(38)	0	0	38	0	0	0	0
New Entrants	0	0	0	0	0	0	0	0
Net Change	(109)	(20)	(46)	2	39	(2)	(9)	(145)
As of December 31, 2019	1,021	225	186	197	1,634	39	224	3,526

Section 3.3 - Member Data Reconciliation – Sheriff’s Department

	Inactive Members							
	Active	Deferred Benefits	Termination Owed Refund	DROP	Retired Members	Disabled Members	Beneficiaries	Total
As of December 31, 2018	360	24	26	33	255	25	59	782
Changes due to:								
Age/Service Retirements	(4)	(5)	0	(3)	10	0	2	0
Disability Retirements	0	0	0	0	0	0	0	0
Deaths Without Beneficiary	0	0	0	0	(6)	0	(4)	(10)
Deaths with Beneficiary	0	0	0	0	(3)	(1)	5	1
Non-Vested Terminations	0	0	0	0	0	0	0	0
Terminations Owed Refund	(3)	0	3	0	0	0	0	0
Vested Terminations	(3)	3	0	0	0	0	0	0
Rehires	0	0	0	0	0	0	0	0
Cash-Outs	(3)	(1)	(5)	0	0	0	0	(9)
Expiration of Benefits	0	0	0	0	0	0	0	0
Data Corrections	0	0	0	0	0	0	0	0
Transfers Out	0	0	(2)	0	0	0	0	(2)
DROP	(14)	0	0	14	0	0	0	0
New Entrants	0	0	0	0	0	0	0	0
Net Change	(27)	(3)	(4)	11	1	(1)	3	(20)
As of December 31, 2019	333	21	22	44	256	24	62	762

Section 3.3 - Member Data Reconciliation – Road Commission

	Inactive Members							
	Active	Deferred Benefits	Termination Owed Refund	DROP	Retired Members	Disabled Members	Beneficiaries	Total
As of December 31, 2018	150	25	2	47	217	14	64	519
Changes due to:								
Age/Service Retirements	(2)	(5)	0	0	6	0	1	0
Disability Retirements	0	0	0	0	0	0	0	0
Deaths Without Beneficiary	0	0	0	0	(9)	0	(4)	(13)
Deaths With Beneficiary	0	0	0	0	(2)	(1)	4	1
Non-Vested Terminations	0	0	0	0	0	0	0	0
Terminations Owed Refund	0	0	0	0	0	0	0	0
Vested Terminations	(2)	2	0	0	0	0	0	0
Rehires	0	0	0	0	0	0	0	0
Cash-Outs	0	0	(2)	0	0	0	0	(2)
Expiration of Benefits	0	0	0	0	0	0	0	0
Data Corrections	0	0	0	0	0	0	0	0
Transfers Out	0	0	0	0	0	0	0	0
DROP	(12)	0	0	12	0	0	0	0
New Entrants	0	0	0	0	0	0	0	0
Net Change	(16)	(3)	(2)	12	(5)	(1)	1	(14)
As of December 31, 2019	134	22	0	59	212	13	65	505

Section 3.3 - Member Data Reconciliation – Martha T Berry

	Inactive Members							
	Active	Deferred Benefits	Termination Owed Refund	DROP	Retired Members	Disabled Members	Beneficiaries	Total
As of December 31, 2018	111	20	96	6	155	11	23	422
Changes due to:								
Age/Service Retirements	(2)	(2)	0	(4)	8	0	0	0
Disability Retirements	0	0	0	0	0	0	0	0
Deaths Without Beneficiary	0	0	0	0	(3)	0	(5)	(8)
Deaths With Beneficiary	0	0	0	0	(1)	0	1	0
Non-Vested Terminations	(4)	0	0	0	0	0	0	(4)
Terminations Owed Refund	(2)	0	2	0	0	0	0	0
Vested Terminations	(2)	(2)	0	0	0	0	0	0
Rehires	0	0	0	0	0	0	0	0
Cash-Outs	(8)	(2)	(27)	0	0	0	0	(37)
Expiration of Benefits	0	0	0	0	0	0	0	0
Data Corrections	(1)	0	1	0	0	0	0	0
Transfers Out	0	0	0	0	0	0	0	0
DROP	(2)	0	0	2	0	0	0	0
New Entrants	0	0	0	0	0	0	0	0
Net Change	(21)	(2)	(24)	(2)	4	0	(4)	(49)
As of December 31, 2019	90	18	72	4	159	11	19	373

Section 3.4 - Schedule of Active Member Data

Valuation Date	Number					Annual Earnings	Annual Average Earnings	Percent Increase / (Decrease) in Average Earnings
	General County	Sheriff's Department	Road Commission	Martha T. Berry	Total			
December 31, 2011	1,422	390	216	170	2,198	108,900,180	49,545	0.9%
December 31, 2012	1,334	376	213	156	2,079	105,391,874	50,694	2.3%
December 31, 2013	1,328	377	207	156	2,068	102,252,875	49,445	(2.5)%
December 31, 2014	1,392	380	214	148	2,134	110,159,044	51,621	4.4%
December 31, 2015	1,448	408	199	168	2,223	105,254,524	47,348	(8.3)%
December 31, 2016	1,322	380	189	129	2,020	116,574,389	57,710	21.9%
December 31, 2017	1,212	367	163	100	1,842	107,492,731	58,357	1.1%
December 31, 2018	1,130	360	150	111	1,751	103,002,972	58,825	0.8%
December 31, 2019	1,021	333	134	90	1,578	97,589,925	61,844	5.1%

Section 3.5 - Schedule of Inactive Member Data

Valuation Date	Number					Annual Retirement Benefits	Average Annual Retirement Benefits
	General County	Sheriff's Department	Road Commission	Martha T. Berry	Total		
December 31, 2014	179	18	13	16	226	2,610,266	11,550
December 31, 2015	233	26	3	20	282	3,527,398	12,509
December 31, 2016	236	19	16	17	288	3,566,016	12,382
December 31, 2017	236	21	21	15	293	3,509,155	11,977
December 31, 2018	245	24	25	20	314	3,969,425	12,641
December 31, 2019	225	21	22	18	286	3,859,533	13,495

Section 3.6 - Schedule of Retired Members by Type of Benefit and Option Elected

Amount of Monthly Pension Benefit	Number of Recipients	Type of Pension Benefit			Option Selected			
		1	2	3	1	3	4	5
\$ 1 - \$ 300	99	56	42	1	68	6	20	5
301 - 600	315	238	69	8	163	28	53	71
601 - 900	398	318	66	14	180	40	63	115
901 - 1,200	341	286	38	17	131	41	64	105
1,201 - 1,500	256	215	30	11	102	31	40	83
1,501 - 1,800	221	179	28	14	90	24	37	70
1,801 - 2,100	198	160	29	9	70	28	51	49
2,101 - 2,400	182	161	17	4	51	24	46	61
2,401 - 2,700	145	130	14	1	50	19	32	44
2,701 - 3,000	136	123	12	1	37	13	41	45
3,001 - 3,300	105	90	14	1	29	8	33	35
3,301 - 3,600	84	80	2	2	17	6	23	38
3,601 - 3,900	59	54	3	2	14	6	20	19
3,901 - 4,200	48	46	1	1	7	5	14	22
Over \$4,200	131	125	5	1	31	8	50	42
Totals	2,718	2,261	370	87	1,040	287	587	804

- | Type of Pension Benefit | Option Selected |
|-------------------------|------------------------|
| 1. Regular retirement | 1 = Straight Life |
| 2. Survivor payment | 3 = Years Certain |
| 3. Disability | 4 = Joint and Survivor |
| | 5 = Pop-Up |

Section 3.6a - Schedule of DROP Participants by Option Elected

Amount of Monthly Pension Benefit	Number of Recipients	Option Selected			
		1	3	4	5
\$ 1 - \$ 300	1	1	0	0	0
301 - 600	0	0	0	0	0
601 - 900	13	4	0	0	9
901 - 1,200	31	9	1	8	13
1,201 - 1,500	26	9	1	4	12
1,501 - 1,800	35	7	2	9	17
1,801 - 2,100	32	7	7	7	11
2,101 - 2,400	26	5	2	7	12
2,401 - 2,700	21	5	1	3	12
2,701 - 3,000	24	4	1	5	14
3,001 - 3,300	21	5	2	3	11
3,301 - 3,600	15	1	1	5	8
3,601 - 3,900	11	0	2	2	7
3,901 - 4,200	10	1	0	3	6
Over \$4,200	38	4	2	10	22
Totals	304	62	22	66	154

Option Selected

1 = Straight Life

3 = Years Certain

4 = Joint and Survivor

5 = Pop-Up

Section 3.7 - Schedule of Benefit Payments

Attained Age	Regular Retirement & Survivor Payment		Disability		Total	
	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances
Under 30	7	91,630	0	0	7	91,630
30-34	1	19,206	0	0	1	19,206
35-39	4	67,302	1	9,578	5	76,880
40-44	6	79,192	6	109,249	12	188,441
45-49	12	178,316	3	53,854	15	232,170
50-54	90	2,781,882	14	327,882	104	3,109,764
55-59	227	6,737,058	17	303,760	244	7,040,818
60-64	463	11,376,022	19	407,016	482	11,783,038
65-69	555	12,393,037	9	124,031	564	12,517,068
70-74	473	9,439,990	7	103,267	480	9,543,257
75	73	1,345,621	1	6,019	74	1,351,640
76	77	1,416,111	2	38,809	79	1,454,920
77	83	1,606,275	0	0	83	1,606,275
78	63	1,224,043	1	5,513	64	1,229,557
79	57	929,115	2	21,166	59	950,281
80	47	802,326	1	6,030	48	808,356
81	53	943,702	0	0	53	943,702
82	44	640,936	0	0	44	640,936
83	38	555,823	0	0	38	555,823
84	26	370,826	1	15,285	27	386,111
85	32	396,898	0	0	32	396,898
86	26	318,386	0	0	26	318,386
87	31	358,197	1	9,667	32	367,864
88	25	248,464	0	0	25	248,464
89	16	180,708	1	1,637	17	182,345
90	31	341,864	0	0	31	341,864
91	18	283,857	1	6,813	19	290,669
92	14	159,201	0	0	14	159,201
93	9	117,803	0	0	9	117,803
94	14	137,117	0	0	14	137,117
95	6	51,618	0	0	6	51,618
96	2	6,133	0	0	2	6,133
97	2	6,729	0	0	2	6,729
98	3	20,219	0	0	3	20,219
99	0	0	0	0	0	0
100	1	2,633	0	0	1	2,633
101	2	6,674	0	0	2	6,674
102	0	0	0	0	0	0
103+	0	0	0	0	0	0
Total	2,631	55,634,913	87	1,549,577	2,718	57,184,491

Section 3.7 - Schedule of Benefit Payments (Continued)

Attained Age	Deferred Vested Members		DROP Members	
	No.	Estimated Annual Allowances	No.	Estimated Annual Allowances
Under 30	0	0	0	0
30	1	14,160	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	4	48,613	0	0
35	1	6,843	0	0
36	3	34,127	0	0
37	1	13,516	0	0
38	5	97,778	0	0
39	6	80,178	0	0
40	4	50,266	0	0
41	7	105,677	0	0
42	4	72,898	0	0
43	14	179,524	0	0
44	20	303,028	0	0
45	16	267,214	0	0
46	10	197,779	0	0
47	13	250,963	1	66,153
48	14	296,073	2	96,396
49	8	150,987	2	132,177
50	14	195,483	19	717,507
51	9	77,456	12	428,913
52	8	124,551	19	790,701
53	11	118,472	22	730,807
54	17	192,685	19	626,587
55	18	195,328	26	936,874
56	18	159,058	24	650,975
57	24	309,819	24	761,715
58	9	84,026	11	364,520
59	14	144,720	12	344,975
60	3	21,182	16	452,727
61	3	11,992	22	435,806
62	2	15,872	14	390,899
63	2	12,375	12	207,292
64	0	0	14	369,198
65	3	26,890	11	194,228
66	0	0	7	108,628
67	0	0	4	141,620
68	0	0	11	271,006
Total	286	3,859,533	304	9,219,704

Section 4 - Actuarial Assumptions, Methods and Additional Information for Funding

Valuation Date

December 31, 2019

Actuarial Methods

Actuarial Cost Method

Entry Age Normal

Amortization Method

Period

14 years remaining. Initially established as 20 years with the December 31, 2013 actuarial valuation

Open or Closed

Closed - each year the amortization period is reduced by 1 year

Aggregate or Layered basis

Aggregate - the total unfunded actuarial accrued liability (UAAL) as of the valuation date is amortized over the remaining period

UAAL Payment Increase

The UAAL payments are developed such that they would increase by 5.00% per year

Asset Valuation Method

The Actuarial Value of Assets is based on a 5 year smoothing method and is determined by spreading each year's investment return in excess of or below the expected return.

Interest Rate and Inflation

Investment Rate of Return	7.00%
Inflation Assumption	3.00%

Marriage Assumption

100% of males and 100% of females are married, with males three years older than their female spouse.

Expense Load for Contribution Amount

Previous year's administrative expense increased by the inflation assumption of 3.00% and allocated by employer payroll. Administrative expenses are allocated based on the ratio of beginning of year actuarial value of assets for the asset allocation between groups in Section 2.3.

Participant Data

All census data used in these calculations was supplied by the employer.

Section 4 - Actuarial Assumptions, Methods and Additional Information for Funding (continued)

Retirement Rates

According to the following rates upon the attainment of retirement eligibility.

Age	General County	Martha T. Berry	Road Commission	Sheriff's Department	Sheriff's Department	
	All Employees	All Employees	All Employees	<25 Years of Service	Retirement Service	25+ Years of Service
50	30%	30%	30%	-	25	75%
51	30%	30%	30%	-	26	50%
52	30%	30%	30%	-	27	50%
53	30%	30%	30%	-	28	50%
54	30%	30%	30%	-	29	50%
55	25%	25%	30%	-	30	50%
56	25%	25%	30%	-	31	50%
57	25%	25%	30%	-	32	50%
58	25%	25%	30%	-	33	50%
59	25%	25%	30%	-	34	50%
60	25%	25%	35%	25%	35 & Up	100%
61	25%	25%	35%	25%	-	-
62	25%	25%	50%	25%	-	-
63	25%	25%	50%	25%	-	-
64	25%	25%	50%	25%	-	-
65	25%	25%	100%	100%	-	-
66	25%	25%	100%	100%	-	-
67	25%	25%	100%	100%	-	-
68	25%	25%	100%	100%	-	-
69	25%	25%	100%	100%	-	-
70 & Up	100%	100%	100%	100%	-	-

Section 4 - Actuarial Assumptions, Methods and Additional Information for Funding (continued)

Disability Incidence

Sample rates of disability are shown in the following table:

Disability Rates	
Age	% of Active Members Becoming Disabled within Next Year
25	0.0675%
30	0.0825%
35	0.1125%
40	0.1650%
45	0.2700%
50	0.4575%
55	0.7575%
60	1.2450%

Termination Rates

Sample rates of active members separating service are shown in the following table:

% of Active Members Separating within Next Year					
Sample Age	Years of Service	General County	Sheriff's Department	Road Commission	Martha T Berry MCF
ALL	0	11.00%	8.00%	6.50%	24.00%
	1	11.00%	8.00%	6.00%	18.00%
	2	8.00%	6.00%	5.50%	16.00%
	3	7.00%	3.00%	5.00%	12.00%
	4	6.00%	3.00%	4.50%	12.00%
25	5 & Over	11.60%	4.80%	5.00%	17.40%
30		10.60%	3.30%	4.00%	15.90%
35		8.60%	3.00%	4.00%	12.90%
40		6.60%	2.25%	3.00%	9.90%
45		4.60%	1.50%	2.00%	6.90%
50		3.60%	0.75%	1.00%	5.40%
55		3.50%	0.75%	1.00%	5.25%
60		3.00%	0.75%	1.00%	4.50%

Section 4 - Actuarial Assumptions, Methods and Additional Information for Funding (continued)

Mortality

RP-2014 (Base 2006) Mortality Tables adjusted by 105% for males and 110% for females, projected with Scale MP-2018 on a fully generational basis was used for Retired and Survivor members.

RP-2014 (Base 2006) Mortality Tables projected with Scale MP-2018 on a fully generational basis was used for Active and Deferred Vested members.

RP-2014 (Base 2006) Disabled Mortality Tables adjusted by 106% for males and 114% for females, projected with Scale MP-2018 on a fully generational basis was used for Disabled members.

DROP Assumptions

75% of eligible participants are assumed to enter DROP and remain in DROP for 4 years.

Salary Increase

Rates of salary increases are shown in the following table:

Years of Service	General County	Sheriff's Department	Road Commission	Martha T Berry MCF
0	12.00%	18.00%	15.00%	12.00%
1	8.00%	11.00%	9.00%	5.00%
2	6.00%	11.00%	6.00%	5.00%
3	6.00%	10.00%	6.00%	5.00%
4	6.00%	7.00%	3.00%	5.00%
5	6.00%	7.00%	3.00%	5.00%
6	4.00%	4.00%	3.00%	5.00%
7	4.00%	4.00%	3.00%	5.00%
8	3.00%	4.00%	3.00%	3.00%
9	3.00%	4.00%	3.00%	3.00%
10	3.00%	4.00%	3.00%	3.00%
11+	3.00%	4.00%	3.00%	3.00%

Final Average Compensation Loads

General County & Martha T Berry	4.50%
Road Commission	6.00%
Sheriff's Department	
Command (hired before 11/1/1996)	11.00%
Correction Officers	1.00%
Dispatchers	1.00%
Others	0.00%

This load on pay is to approximate the accumulated sick time leave that gets factored into final benefit calculations.

Section 4 - Actuarial Assumptions, Methods and Additional Information for Funding (continued)

Changes Since the Prior Valuation

The actuarial assumptions and methods for funding purposes are the same as those used for the December 31, 2018 valuation report.

Section 5 – Summary of Plan Provisions

Summary of DROP Provisions

Please refer to the Benefit Provision Summary for DROP eligibility provisions. The other provisions of the DROP are listed below:

- The DROP is a forward DROP.
- Members can DROP when they first become eligible for an unreduced benefit.
- Upon entering the DROP, 100% of the member's monthly retirement benefit will be credited to the DROP account.
- The DROP account will be credited with the same interest rate used to accumulate member contributions.
- The maximum DROP period is five years. Members may continue to work past the maximum DROP period, but no additional retirement benefits will be credited to the member's DROP account. Interest on the DROP account will continue to accrue for members working past the maximum DROP period.
- Member contributions to the Retirement System will cease upon entering the DROP.
- Upon actual retirement, the member would receive a monthly annuity equal to the accrued benefit credited to the DROP account under any form of payment available from the plan, and the lump sum amount accumulated in the DROP account. Members elect their form of payment at time of DROP.
- The monthly annuity as of the DROP date is calculated based on service, final average compensation and benefit provisions as of the DROP date less the annuity withdrawal reduction, if applicable; this amount is not changed for any subsequent changes in pay or benefit provisions. The annuity withdrawal is paid at the time of DROP.
- For POLC (Union 1 & 20) and MCDPSA (Union 26), interest is earned on the DROP account balance at the end of each month and shall be paid to the employee's DROP account no later than the last day of the following month.
- For POLC (Union 1), effective August 20, 2010, for new entries into DROP, upon reaching the five-year maximum DROP participation period, the DROP participant shall terminate his/her employment.
- For POAM (Union 7), effective August 6, 2010, an employee of Macomb County who is a member of the POAM-Deputies and Dispatchers, may voluntarily elect to participate in the DROP, upon obtaining the minimum age and service requirements for a normal service retirement.

Section 5 – Summary of Plan Provisions (continued)

Benefit Provision Summary For General Employees									
Division Code	Division Name	Benefit Tier	Service Needed to Vest	DROP Eligible?	Retirement Eligibility (Age/Service)	Multiplier	Employer Maximum	FAC Period	Employee Contribution
0	General Non Union	Hired on or before 12/31/2001 or vested by 2/26/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
2	UAW Animal Shelter	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
3	AFSCME Local 411	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
6	Macomb County Environmental Health Association	Hired on or before 12/31/2001 or vested by 5/1/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
8	Teamsters 214 Court Reporters	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
9	International Union of Operating Engineers (Boiler Operators)	Hired on or before 12/31/2001 or vested by 5/1/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
10	TPOAM Circuit Court Officers	Hired on or before 12/31/2001 or vested by 7/24/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
11	MNA Unit I Health Dept.	Hired on or before 12/31/2001 or vested by 5/1/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
12	UAW Local 412 Unit 49 Information Technology	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
13	UAW Local 889 Specialized Offices	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
15	Building Trades Association	Hired on or before 12/31/2001 or vested by 5/1/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%

* Must be vested on 12/31/2012, otherwise not eligible for DROP.

** Minimum Age 50

Section 5 – Summary of Plan Provisions (continued)

Benefit Provision Summary For General Employees									
Division Code	Division Name	Benefit Tier	Service Needed to Vest	DROP Eligible?	Retirement Eligibility (Age/Service)	Multiplier	Employer Maximum	FAC Period	Employee Contribution
16	UAW Local 412 Unity 46 Assistant Prosecutors	Hired on or before 12/31/2001 or vested by 9/14/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
18	Teamsters Local 214 FOC/Circuit Court	Hired on or before 12/31/2001 or vested by 7/24/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
19	General	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
21	POAM JJC	Hired on or before 12/31/2001 or vested by 5/1/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
24	UAW Local 889 MCCSA	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
25	UAW Local 412 Unit 75 Supervisors	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
27	TPOAM Macomb Co. Senior Service Employees Association	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
28	TPOAM Juvenile Court & Justice Center Employees	Hired on or before 12/31/2001 or vested by 6/19/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
30	UAW Local 412 Unit 95 Assistant Corporation Counsel	Hired on or before 12/31/2001 or vested by 2/27/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
43	UAW Local 889 Probate Court/ Corporation Counsel	Hired on or before 12/31/2001 or vested by 6/19/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
44	UAW Local 412 - Unit 98 MCCSA Professionals	Hired on or before 12/31/2001 or vested by 2/26/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%

* Must be vested on 12/31/2012, otherwise not eligible for DROP.

** Minimum Age 50

Section 5 – Summary of Plan Provisions (continued)

Benefit Provision Summary For Sheriff Employees									
Division Code	Division Name	Benefit Tier	Service Needed to Vest	DROP Eligible?	Retirement Eligibility (Age/Service)	Multiplier	Employer Maximum	FAC Period	Employee Contribution
1	COAM - Command	Hired before 11/1/1996	8 years	Yes*	60/8, 25 & out	2.4% / 1% (26 yrs)	66% of FAC	3 years	4%
		Hired on or after 11/1/1996 & before 6/1/2013	8 years	Yes*	60/8, 25 & out	2.64% for 25 yrs	66% of FAC	3 years	4%
		Hired on or after 6/1/2013 & before 12/31/2015	15 years	No	60/15, 25 & out	2.64% for 25 yrs	66% of FAC	3 years	4%
7	FOP Deputies	Hired before 6/1/2013	8 years	Yes*	60/8, 25 & out	2.64% for 25 yrs	66% of FAC	3 years	4%
		Hired on or after 6/1/2013 & before 12/31/2015	15 years	No	60/15, 25 & out	2.64% for 25 yrs	66% of FAC	3 years	4%
7	FOP Dispatchers	Hired before 6/1/2013	8 years	Yes*	60/8, 25 & out	2.64% for 25 yrs	66% of FAC	3 years	4%
		Hired on or after 6/1/2013 & before 12/31/2015	15 years	No	60/15, 25 & out	2.64% for 25 yrs	66% of FAC	3 years	4%
20	POLC Captains	Hired before 6/1/2013	8 years	Yes*	60/8, 25 & out	2.4% / 1% (26 yrs)	65% of FAC	3 years	4%
		Hired on or after 6/1/2013 & before 12/31/2015	15 years	No	60/15, 25 & out	2.4% / 1% (26 yrs)	65% of FAC	3 years	4%
26	MCPDSA Corrections Officers	Hired before 6/1/2013	8 years	Yes*	60/8, 25 & out	2.4% / 1% (26 yrs)	66% of FAC	3 years	4%
		Hired on or after 6/1/2013 & before 12/31/2015	15 years	No	60/15, 25 & out	2.4% / 1% (26 yrs)	66% of FAC	3 years	4%

* Must be vested on 12/31/2012, otherwise not eligible for DROP.

Benefit Provision Summary For Road Commission Employees									
Division Code	Division Name	Benefit Tier	Service Needed to Vest	DROP Eligible?	Retirement Eligibility (Age/Service)	Multiplier	Employer Maximum	FAC Period	Employee Contribution
31	Road Non-Union	Hired on or before 7/31/2007 or vested by 1/29/2015	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 8/1/2007 & before 12/17/2013	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 12/17/2013 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
32	Road ADTECH	Hired on or before 7/31/2007 or vested by 1/29/2015	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 8/1/2007 & before 12/17/2013	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 12/17/2013 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
33	Road ROADTECH	Hired on or before 7/31/2007 or vested by 1/29/2015	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 8/1/2007 & before 6/1/2013	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 6/1/2013 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%

* Must be vested on 12/31/2012, otherwise not eligible for DROP.

** Minimum Age 50

Section 5 – Summary of Plan Provisions (continued)

Benefit Provision Summary For Martha T. Berry Employees									
Division Code	Division Name	Benefit Tier	Service Needed to Vest	DROP Eligible?	Retirement Eligibility (Age/Service)	Multiplier	Employer Maximum	FAC Period	Employee Contribution
4	MNA (RNs at MTB)	Hired on or before 12/31/2001 or vested by 7/17/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
5	Service Employees International Union (LPNs at MTB)	Hired on or before 12/31/2001 or vested by 7/17/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
14	AFSCME 411 MTB	Hired on or before 12/31/2001 or vested by 6/26/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
40	MTB Non Union Employees	Hired on or before 12/31/2001 or vested by 2/26/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%
42	MTB UAW Supervisors	Hired on or before 12/31/2001 or vested by 6/26/2009	8 years	Yes*	60/8, Rule of 70**	2.4% / 1% (26 yrs)	65% of FAC	4 years	3.5%
		Hired on or after 1/1/2002 & before 1/1/2012	8 years	Yes*	55/25, 60/8	2.20%	66% of FAC	5 years	2.5%
		Hired on or after 1/1/2012 & before 12/31/2015	15 years	No	55/25, 60/15	2.20%	66% of FAC	5 years	2.5%

* Must be vested on 12/31/2012, otherwise not eligible for DROP.

** Minimum Age 50

Participation in the Plan

The Retirement System is closed to new entrants, effective December 31, 2015.

Lump Sum Termination Benefit

At termination, participants hired on or after January 1, 2016 and have 5 years of service are eligible for a \$1,000 lump sum payment.

Death Benefit

No age or service requirements:

Refund of accumulated contributions.

10 or more years of service:

Computed as laid out in the Benefit Provision Summary but actuarially reduced in accordance with a 100% joint and survivor election.

Disability Benefit

Computed as laid out in the Benefit Provision Summary with a minimum benefit of \$400 per month.

Section 6 – ASOP 51 Disclosures

Funding future retirement benefits prior to when those benefits become due involves assumptions regarding future economic and demographic experience. These assumptions are applied to calculate actuarial liabilities, current contribution requirements and the funded status of the plan. However, to the extent future experience deviates from the assumptions used, variations will occur in these calculated values. These variations create risk to the plan. Understanding the risks to the funding of the plan is important. Therefore, a new Actuarial Standard of Practice (ASOP) has been adopted. Actuarial Standard of Practice No. 51 (“ASOP 51”) requires certain disclosures of potential risks to the plan and provides useful information for intended users of actuarial reports that determine plan contributions or evaluate the adequacy of specified contribution levels to support benefit provisions.

Under ASOP 51, risk is defined as the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience.

It is important to note that not all risk is negative, but all risk should be understood and accepted based on knowledge, judgement and educated decisions. Future measurements may deviate in ways that produce positive or negative financial impacts to the plan.

In the actuary’s professional judgment, the following risks may reasonably be anticipated to significantly affect the plan’s future financial condition.

- Investment risk – potential that the investment return will be different than the 7.00% expected in the actuarial valuation
- Longevity risk – potential that participants live longer than expected from the valuation mortality assumptions
- Contribution risk – potential that the contribution will be different than the recommended contribution in the actuarial valuation

The following information is provided to comply with ASOP 51 and furnish beneficial information on potential risks to the plan. This list is not all-inclusive; it is an attempt to identify the most significant risks and how those risks might affect the results shown in this report.

Section 6 – ASOP 51 Disclosures (continued)

Note that ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor to make contributions to the plan when due, or to assess the likelihood or consequences of potential future changes in law. In addition, this valuation report is not intended to provide investment advice or to provide guidance on the management or reduction of risk. Buck welcomes the opportunity to assist in such matters as part of a separate project or projects utilizing the appropriate staff and resources for those objectives.

Investment Risk

Plan costs are very sensitive to the market return. Any lower than assumed return on assets will increase costs:

- The lower market return will cause the market value of assets to be lower than expected.
- The plan uses an actuarial value of assets that smooths gains and losses on market returns over a five-year period to help control some of the volatility in costs due to investment risk.
- Past volatility of asset returns can be seen in Section 2.4 on page 17.

Longevity Risk

Plan costs will be increased as participants are expected to live longer. This is because:

- Benefits are paid over a longer lifetime when life expectancy is expected to increase. The longer duration of payments leads to higher liabilities.
- Health care has been improving which increases the life expectancy of participants. As health care improves, costs to the plan will increase.
- The mortality assumption for the Plan does assume future improvement in mortality. Any improvement in future mortality greater than that expected by the current mortality assumption would lead to increased costs for the Plan.

Contribution Risk

There is a risk associated with the employer's contribution when the actual amount and recommended amount differ. This is because:

- When the actual contribution is lower than the recommended contribution the Plan may not be sustainable in the long term.
- Any underpayment of the contribution will increase future contribution amounts to help pay off the additional Unfunded Actuarial Accrued Liability associated with any lower than recommended contribution amounts.

Section 6 – ASOP 51 Disclosures (continued)

Plan Maturity Measures:

There are certain measures that may aid in understanding the significant risks to the plan.

Ratio of Retired Liability to Total Liability	December 31, 2019	December 31, 2018	December 31, 2017
1. Retirees and Beneficiaries	604,423,772	598,252,717	575,505,683
2. Total Present Value of Future Benefits	1,151,877,767	1,139,594,415	1,163,097,466
3. Ratio [(1) / (2)]	52.5%	52.5%	49.5%

A mature plan will often have a ratio above 60 - 65 percent. An increasing percentage may indicate a need for a less risky asset allocation which may lead to a lower long-term return on assets assumption and increased costs. Due to the plan being closed to new entrants, this ratio is expected to grow over time and eventually equal 100%.

Ratio of Cash Flow to Assets	December 31, 2019	December 31, 2018	December 31, 2017
1. Contributions	20,346,143	26,999,720	25,124,450
2. Benefit Payments	67,917,452	66,297,751	65,895,203
3. Cash Flow [(1) – (2)]	(47,571,309)	(39,298,031)	(40,770,753)
4. Market Value of Assets	1,082,041,799	937,087,932	1,037,372,865
5. Ratio [(3) / (4)]	(4.40%)	(4.19%)	(3.93%)

When this cash flow ratio is negative more cash is being paid out than deposited in the fund. Negative cash flow means the fund needs to rely on investment returns to cover benefit payments and at the same time may need to invest in more liquid assets to cover the benefit payments. More liquid assets may not garner the same returns as less liquid assets and therefore increase the investment risk. However, the low magnitude of the ratio implies there may already be enough liquid assets to cover the benefit payments, less investment return is needed to cover the shortfall, or only a small portion of assets will need to be converted to cash. Therefore, the investment risk is likely not amplified at this time. Due to the plan being closed to new entrants, this measure will grow increasingly negative as the plan moves toward wind down in the distant future.

Section 6 – ASOP 51 Disclosures (continued)

Contribution Volatility	December 31, 2019	December 31, 2018	December 31, 2017
1. Market Value of Assets	1,082,041,799	937,087,932	1,037,372,865
2. Payroll	101,650,261	107,524,311	112,878,234
3. Asset Volatility Ratio (AVR) [(1) / (2)]	10.64	8.72	9.19
4. Accrued Liability	1,054,636,606	1,034,282,157	1,013,110,113
5. Liability Volatility Ratio (LVR) [(4) / (2)]	10.38	9.62	8.98

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 10 may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 5. Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, if an assumption change increases the liability of two plans by the same percent the plan with a liability-to-payroll ratio of 10 may experience twice the contribution volatility than a plan with a liability-to-payroll ratio of 5.

Glossary

Actuarial Accrued Liability

Total accumulated cost to fund pension benefits arising from service in all prior years.

Actuarial Cost Method

Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension plan for a group of plan members to the years of service that give rise to that cost.

Actuarial Present Value of Future Benefits

Amount which, together with future interest, is expected to be sufficient to pay all future benefits.

Actuarial Valuation

Study of probable amounts of future pension benefits and the necessary amount of contributions to fund those benefits.

Actuary

Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.

GASB 67

Governmental Accounting Standards Board Statement Number 67.

Maturity Ratio

The ratio of the actuarial accrued liability for members who are no longer active to the total actuarial accrued liability. A ratio of over 50% indicates a mature plan. The higher the maturity ratio, the more volatile the contribution rate will be from year to year given actuarial gains and losses.

Normal Cost

That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.

Unfunded Actuarial Accrued Liability (UAAL)

The portion of the actuarial accrued liability not offset by plan assets.