Oakland County Employees' Retirement System

Annual Actuarial Valuation Report

September 30, 2019

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February 19, 2020

The Retirement Commission
Oakland County Employees' Retirement System
Waterford, Michigan

Dear Commission Members:

Submitted in this report are the results of the September 30, 2019 actuarial valuation of the liabilities, funded position and contribution requirements associated with benefits provided by the Oakland County Employees' Retirement System. The purpose of the valuation was to measure the System's funding progress and determine the employer contribution for the 2020-2021 fiscal year. This report should not be relied upon for any other purpose. This report may be provided to parties other than the Retirement Commission only in its entirety and only with the permission of the Commission. GRS is not responsible for unauthorized use of this report.

The valuation was based upon the actuarial assumptions and methods adopted by the Retirement Commission, information furnished by the Retirement System, including System benefits, financial transactions, and individual members, terminated members, retirees and beneficiaries. Data was checked for internal and year to year consistency, but was not audited by us. As a result, we are unable to assume responsibility for the accuracy or completeness of the data provided.

The Fiscal year 2021 contributions shown in this report were determined using the actuarial assumptions and methods disclosed in Section D of this report. This report includes risk metrics on pages C-4, D-2 and E-1 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. These additional risk metrics were beyond the scope of this assignment. We encourage a review and assessment of investment and other significant risks which may have a material impact on the System's financial condition.

Future actuarial measurements may differ significantly from those presented in this report due to such factors as experience differing from that anticipated by actuarial assumptions, changes in plan provisions, actuarial assumptions/methods or applicable law. Due to the limited scope of this assignment, we did not perform an analysis of the potential range of future measurements. This valuation assumes the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination of the plan sponsor's ability to make the necessary contributions is beyond the scope of our expertise and was not performed by GRS.

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This report was prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, this report is complete and accurate and the valuation was conducted in accordance with standards of practice prescribed by the Actuarial Standards Board in compliance with the applicable state statutes. Louise M. Gates and James D. Anderson are independent of the plan sponsor and are Members of the American Academy of Actuaries (MAAA) who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. It is our opinion that the actuarial assumptions used for the valuation produce results which are reasonable.

Respectfully submitted,

Louise Gates

Louise M. Gates, ASA, FCA, MAAA

James D. Anderson

James D. Anderson, FSA, EA, FCA, MAAA

SECTION A

EXECUTIVE SUMMARY

1. Required Employer Contributions – Fiscal Year Beginning October 1, 2020

The computed County contributions are as follows:

Division	Computed Employer Contributions
General County	$ 0
Command Officers	0
Road Deputies	0
Corrections Deputies	0
Total	$ 0

2. Contribution Comparison

The table below compares the required employer contributions in the current and prior year's valuations:

Total County Contributions for the Indicated Fiscal Year	
2019-2020	**2020-2021**
$0	$0

3. Reasons for Change

There are three general reasons why contribution rates change from one valuation to the next. The first is a change in the benefits or eligibility conditions of the plan. The second is a change in the valuation assumptions used to predict future occurrences. The third is the difference during the year between the plan's actual experience and what the assumptions predicted. Although there was no change in the employer contribution from the prior year, there was a decrease in the Retirement System's funding surplus.

There were no benefit or assumption changes made in connection with this valuation of the System. Changes in the Retirement System's funding surplus from the prior year are due to System experience which was overall, unfavorable. During the year ended September 30, 2019 the investment return on plan assets was lower than long term expectations. The market smoothing techniques used in this valuation of the System recognize both past and present investment experience. As a result, the recognized rate of return for the year was 6.08%. Details of this asset smoothing method are shown on page C-4 of this report. This unfavorable experience was offset in part by pay increases for some plan members that were lower than anticipated by actuarial assumptions.

4. Reserve Transfers

For all employment divisions, the computed liability for members who have already retired and their beneficiaries is larger than the reported balance of the retiree reserve accounts. Transfers will be necessary to balance the retiree reserve with the retiree liabilities, as follows:

	General County	Command Officers	Sheriff Deputies*	Total
Retiree Liability	$490,645,890	$ 45,840,609	$121,643,946	$658,130,445
Retiree Reserve	442,896,740	40,779,209	106,556,111	590,232,060
Difference	$ 47,749,150	$ 5,061,400	$ 15,087,835	$67,898,385

* *Road patrol and corrections divisions are combined.*

We recommend that the Retirement Commission authorize the transfers described above.

5. System Funded Percent

The System's funding percent based on the actuarial value of assets (funding value) is 101.1% as of September 30, 2019. Last year, the funding percent measured on the same basis was 102.3%. If the market value of assets were used to determine the System's funding percent as of September 30, 2019, the result would be a funded percent of 99.7%.

Unless otherwise indicated, a funding status measurement presented in this report is based upon the actuarial accrued liability and the funding value of assets. Unless otherwise indicated, it is important to note that the funding status measurement presented in this report is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations and the need for or the amount of future employer contributions.

6. Asset Transfers

Consistent with past practice, this valuation reflects the transfer of assets (within the pension trust) from the General division to the Sheriff's department divisions of $163,601. This transfer redistributes the funding surplus in the General division to the Sheriff's divisions such that the resulting employer contribution for all divisions is $0. The amounts transferred from the General division to the Sheriff's divisions are shown below.

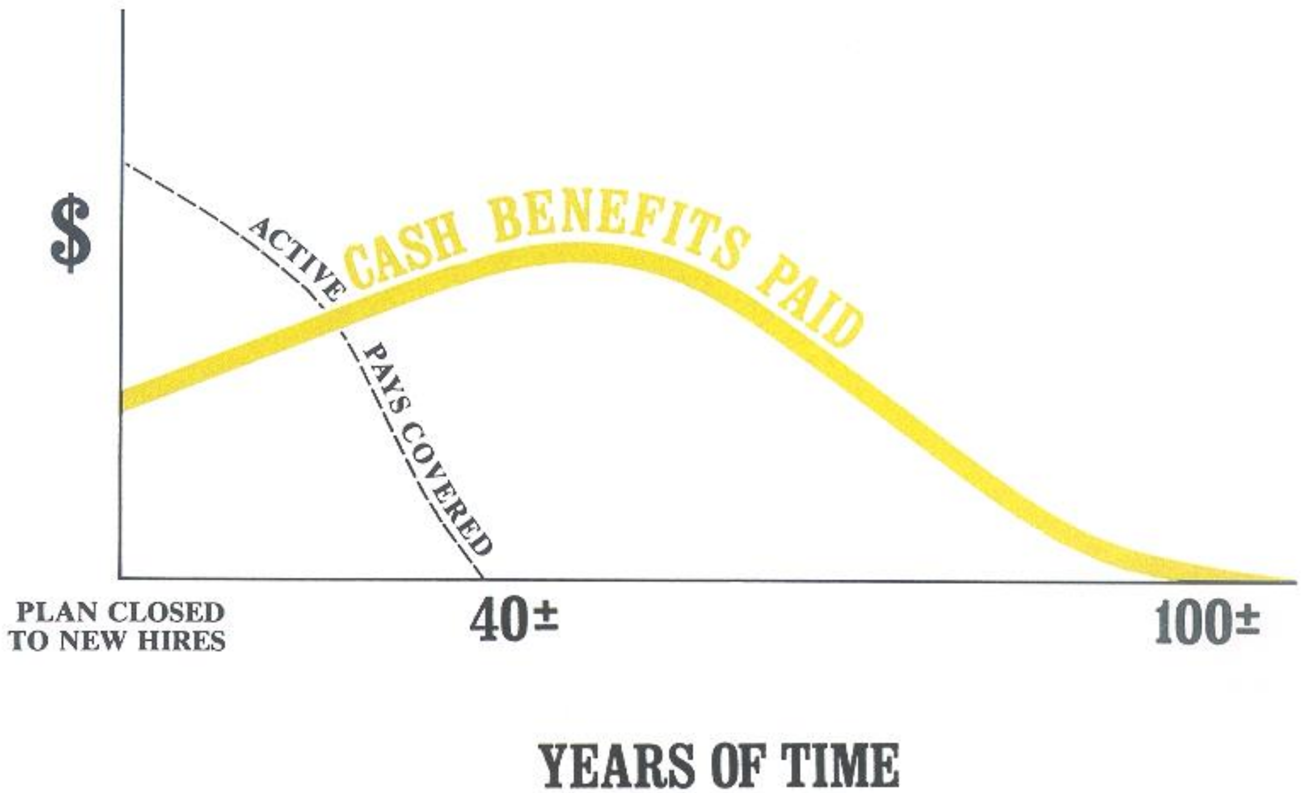
Division	Transfer Amount from General Division
Command Officers	$106,109
Correction Deputies	57,492
	$163,601

7. Looking Ahead

Based on System experience the value of the funding surplus decreased since last year. The current practice of using the funding surplus to reduce County contributions coupled with any unfavorable future System experience will further erode the value of the surplus. Once the surplus is depleted, County contributions to the System will again be required. These contributions will be at least equal to employer normal cost payments. Currently these payments are $0.9 million.

Michigan Public Act 202 of 2017 (the Act) has created new reporting and other requirements for local units of government. Recently, the Department of Treasury (the DOT) issued guidance on uniform actuarial assumptions needed in connection with the Act. The actuarial assumptions currently used in the annual valuations of the System differ from those prescribed by the DOT for reporting purposes under the Act. In the absence of any assumption changes, a separate valuation of the System using DOT compliant assumptions will be needed.

A CLOSED PENSION PLAN



A plan becomes closed when no new hires are admitted to active membership. The persons covered by the plan at the time of closing continue their normal activities and continue to be covered by the plan, until the last survivor dies.

CASH BENEFITS LINE. After a pension plan becomes closed, the usual pattern is for cash benefits to continue to increase for decades of time. Eventually the cash benefits will peak, and then gradually decrease over more decades of time, ultimately to zero. The last cash benefit is likely to occur a century after the time the plan is closed.

The precise amounts of cash benefits cannot be known now, and must be estimated by assumptions of future experiences in a variety of financial risk areas.

SECTION B

VALUATION RESULTS

Required Contributions for the Fiscal Year Beginning October 1, 2020

Contributions for		General County	Command Officers	Road Deputies	Corrections Deputies	All Groups Combined
		Expressed as a % of Covered Payroll and Dollar Amounts				
A	**Normal Cost of Benefits**					
	Age & service	9.74 %	16.34 %	15.69 %	15.20 %	
	Disability	0.53	1.09	1.00	1.55	
	Death before retirement	0.61	0.60	0.55	0.69	
	Future refunds of member contributions	0.00	0.28	0.15	0.14	
	Totals	10.88	18.31	17.39	17.58	12.37 %
B	Member contributions @	0.65	5.00	5.00	5.00	1.60
C	Employer Normal Cost %	10.23 %	13.31 %	12.39 %	12.58 %	10.77 %
D	Employer Normal Cost $	$723,548	$59,559	$88,013	$37,283	$908,403
E	UAL payment / (credit)*	(920,518)	(59,559)	(141,934)	(37,283)	
	Total Employer Contribution $ (D+E)	**$0**	**$0**	**$0**	**$0**	**$0**

* *Unfunded Accrued Liabilities were amortized over a period of 10 years using level dollar financing.*

@ *Reflects a weighted average*

Determination of Unfunded Actuarial Accrued Liability as of September 30, 2019

	General County	Command Officers	Road Deputies	Corrections Deputies	Total
A. Accrued Liability					
1. For retirees and beneficiaries	$490,645,890	$45,840,609	$60,638,386	$61,005,560	$658,130,445
2. For vested and other terminated members	5,285,374	375,209	511,897	277,289	6,449,769
3. For present active members					
a. Value of expected future benefit payments	63,367,290	9,338,359	11,363,555	3,605,825	87,675,029
b. Value of future normal costs	3,838,595	292,992	428,466	184,304	4,744,357
c. Active member accrued liability: (a) - (b)	59,528,695	9,045,367	10,935,089	3,421,521	82,930,672
4. Total accrued liability	555,459,959	55,261,185	72,085,372	64,704,370	747,510,886
B. Valuation Assets (Funding Value)	562,080,215	55,689,524	73,106,148	64,972,506	755,848,393
C. Unfunded Accrued Liability: (A.4) - (B)	(6,620,256)	(428,339)	(1,020,776)	(268,136)	(8,337,507)
D. Funding Ratio: (B) / (A.4)	101.2%	100.8%	101.4%	100.4%	101.1%

Development of Experience Gain/(Loss)
Period Ended September 30, 2019

Actual experience will never (except by coincidence) exactly match assumed experience. It is hoped that gains and losses will cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below.

	All Groups Combined
(1) UAAL* at start of period	$(17,271,464)
(2) Normal cost for period	1,665,384
(3) Actual contributions	232,357
(4) Interest accrual on (1), (2) and (3) at 7.25%	(1,200,234)
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	(17,038,671)
(6) Change from plan provisions	0
(7) Change in actuarial assumptions/methods	0
(8) Expected UAAL after changes: (5) + (6) + (7)	(17,038,671)
(9) Actual UAAL at end of period	(8,337,507)
(10) Gain/(loss): (8) - (9)	(8,701,164)
(11) Gain/(loss) as percent of actuarial accrued liabilities at start of period	(1.16%)

* *Unfunded Actuarial Accrued Liabilities (UAAL)*

Closed Group Cash Flow Projection
(Dollar Amounts in Thousands)

Year	Expected Benefits for Current			
Ending	Actives	Retirees	Inactives	Total
9/30/2020	$ 995	$59,633	$ 59	$60,687
9/30/2021	2,665	59,478	126	62,269
9/30/2022	3,904	59,241	210	63,355
9/30/2023	4,901	58,920	250	64,071
9/30/2024	5,702	58,521	308	64,531
9/30/2025	6,390	58,004	374	64,768
9/30/2026	6,988	57,409	481	64,878
9/30/2027	7,498	56,733	548	64,779
9/30/2028	7,936	55,960	592	64,488
9/30/2029	8,299	55,088	645	64,032

The projection was based on the assumptions and methods shown in Section D of this report and data reported for use in this valuation of the System.

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

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

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

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

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the actuarial liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future actuarial liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future actuarial liability and contributions differing from expected.

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

SECTION C

SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA

Brief Summary of Benefit Provisions
September 30, 2019

Eligibility	Amount
Regular Retirement	
Sheriff's Deputies: 25 years of service regardless of age, or age 60 with 8 years of service.	2.2% of final average compensation (FAC) times the first 14 years of service plus 2.5% of FAC for each additional year.
Command Officers: 25 years of service regardless of age, or age 60 with 8 years of service.	Total service times 2.5% of FAC.
All Others: Age 55 with 25 years of service, or age 60 with 8 years.	Total service times 2.0% of FAC for Plan A members (2.2% for years in excess of 14 for contributing members). Total service times 1.8% of FAC for Plan B members (1.98% for years in excess of 14 for contributing members). Maximum County Portion is 75% of FAC. Type of final average compensation - Highest 5 consecutive years out of the last 10. Some lump sums are included. Sheriff's Deputies hired after 12/31/92, Command Officers entering BU after 5/31/94 and BU48 nurses hired after 12/31/92 overtime pay is excluded from FAC.
Deferred Retirement	
8 years of service - benefit begins at age 60. 25 years of service - benefit at age 55.	Computed as a regular retirement but based upon service and final average compensation at termination date.
Non-Duty Death-in-Service	
10 years of service.	Computed as a regular retirement but actuarially reduced in accordance with a 100% joint and survivor election (50% joint and survivor benefit if less than 15 years of service and under age 60).
Duty Death-in-Service	
No age or service requirements.	Upon termination of Worker's Compensation, a benefit equal to the Worker's Compensation benefit is payable to the spouse, children under age 18 and dependent parents.

Brief Summary of Benefit Provisions
September 30, 2019

Eligibility	Amount

Non-Duty Disability

Eligibility	Amount
10 years of service.	Computed as a regular retirement.

Duty Disability

Eligibility	Amount
No age or service requirements.	Computed as a regular retirement with additional service credited until attainment of age 60. Retirement benefits are offset by Worker's Compensation payments.

Cost-of-Living Adjustments

Eligibility	Amount
	Annual increase based upon change in CPI, not in excess of 1-1/2% of base benefit. Additional one-time increases granted January 1, 1976, 1979, 1981, 1982, July 1, 1984, January 1, 1986, 1987, 1988 and October 1, 1997. A special one-time payment was made to retirees during 1990.

Member Contributions

Eligibility	Amount
Sheriff's Deputies.	3% of annual earnings for the first 14 years of service and 5% thereafter.
Command Officers.	5% of annual earnings.
All Others.	1% of annual earnings for years after 14 years of service for members electing the 2.2% or 1.98% benefit.

County Contributions

Actuarially determined amounts which, together with member contributions, are sufficient to cover value of future benefits during the expected future working lifetimes of present members.

Coverage

The System was closed to new hires effective at various dates during 1994 and 1995.

Reported Financial Information at Market Value
Year Ended September 30, 2019

Income and Disbursements

Market Value of Assets Beginning of Year:		$777,052,179
Revenues:		
a. Member contributions	$ 232,357	
b. Employer contributions	-	
c. Investment income	29,510,011	
d. Total		29,742,368
Disbursements:		
a. Retirement incentive payments	-	
b. Pension benefits paid	59,356,307	
c. Administrative expenses	218,956	
d. Investment expenses	2,024,874	
e. Total		61,600,137
Market Value of Assets End of Year:		$745,194,410

Assets and Reserves as of September 30, 2019

Assets:		**Reserve Accounts:**	
a. Cash and Deposits*	$ 10,072,483	a. Member contributions	$ 1,428,597
b. Interest and Dividends	1,891,552	b. Reserve for benefits now being paid	590,232,060
c. Fixed Income	213,278,650	c. Reserve for future benefits	153,533,753
d. Equities	352,364,376		
e. Real Estate	75,285,298		
f. Other	92,773,812		
g. Accounts Payable	(471,761)	Total	$745,194,410
Total	$ 745,194,410		

** Includes accounts receivable*

Determination of Valuation Assets
as of September 30, 2019

	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	$776,357,214	$769,933,304				
B. Market Value End of Year	777,052,179	745,194,410				
C. Market Value Beginning of Year	785,011,127	777,052,179				
D. Non-Investment Net Cash Flow	(57,277,755)	(59,123,950)				
E. Investment Income						
E1. Market Total: B - C - D	49,318,807	27,266,181				
E2. Assumed Rate (I)	7.25%	7.25%				
E3. Amount for Immediate Recognition:						
7.25% x (A + D/2)	54,209,579	53,676,921				
E4. Amount for Phased-In Recognition: E1-E3	(4,890,772)	(26,410,740)				
F. Phased-In Recognition of Investment Income						
F1. Current Year: E4/5	(978,154)	(5,282,148)				
F2. First Prior Year	5,663,719	(978,154)	($5,282,148)			
F3. Second Prior Year	2,081,635	5,663,719	(978,154)	($5,282,148)		
F4. Third Prior Year	(10,122,934)	2,081,635	5,663,719	(978,154)	($5,282,148)	
F5. Fourth Prior Year	0	(10,122,934)	2,081,635	5,663,719	(978,154)	($5,282,148)
F6. Total Recognized Investment Gain/(Loss)	(3,355,734)	(8,637,882)	1,485,052	(596,583)	(6,260,302)	(5,282,148)
G. Funding Value End of Year: A + D + E3 + F6	**$769,933,304**	**$755,848,393**				
H. Difference Between Market & Funding Value	7,118,875	(10,653,983)				
I. Recognized Rate of Return	**6.80%**	**6.08%**				
J. Market Value Rate of Return	**6.52%**	**3.65%**				
K. Ratio of Funding Value to Market Value	**0.991**	**1.014**				

Retirees and Beneficiaries, September 30, 2019
Tabulated by Type of Benefit and Option Elected

Benefit Option Elected	Type of Benefit			
	Age & Service*	Disability		Total
		Non-Duty	Duty	
Regular	704	2		706
A-100% J & S	397	6	1	404
B-50% J & S	119			119
C-10 Year Certain	98	4		102
D(1)-100% J & S with pop-up	254	1	1	256
D(2)-50% J & S with pop-up	166			166
E-Social Security Equated				
Survivor	268			268
Total	**2,006**	**13**	**2**	**2,021**

* *Includes alternate payees receiving EDRO benefits, beneficiaries of deceased members, and 30 individuals reported with $0 pension benefits as of September 30, 2019, receiving retiree health benefits only.*

Inactive Members as of September 30, 2019
Tabulated by Attained Age

There were 66 Inactive members reported as of September 30, 2019 involving estimated deferred annual retirement allowances totaling $715,867. An inactive member is a person who has left County employment with entitlement retirement benefits upon attaining their deferred retirement age. The schedule below shows the inactive members by age.

Attained Age	No.	Estimated Deferred Allowance
40 - 44	1	$ 6,267
45 - 49	6	124,785
50 - 54	22	264,705
55 - 59	30	305,834
60 - 64	1	11,239
65 - 69	1	3,037
Totals	**61**	**$715,867**

Active Members as of September 30, 2019
by Age and Years of Service

Age	Years of Service on Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
45-49					4	9	1	14	$ 947,179
50-54					1	22	17	40	2,991,976
55-59					4	22	30	56	4,221,847
60						2	8	10	830,021
61						1	4	5	392,074
62						3	2	5	293,433
63						1	4	5	325,494
64					1	1	3	5	373,591
65					1	1	3	5	347,544
66						1	5	6	427,110
67						1	2	3	257,940
68						1	1	2	154,895
69							1	1	55,143
70+							4	4	323,175
Totals					**11**	**65**	**85**	**161**	**$11,941,422**

While not used in the financial computations, the following group averages are computed and shown because of their general interest. The chart shown above includes 129 General County division employees, 11 Command Officers, 15 Road Patrol Deputies, and 6 Corrections Officers.

Group Averages:

Age: 57.3 years
Service: 30.8 years
Annual Pay: $ 74,170

SECTION D

ACTUARIAL COST METHODS, ACTUARIAL ASSUMPTIONS AND GLOSSARY

Valuation Methods

The Individual Entry-Age Actuarial Cost Method is a method for determining the normal cost and the allocation of benefit values between service rendered before and after the valuation date. It has the following characteristics:

(i) the annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

(ii) each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Actuarial gains/(losses), as they occur, reduce (increase) the Unfunded Actuarial Accrued Liability.

Starting with the September 30, 2015 actuarial valuation, the individual entry age cost method was used to determine employer contributions.

Valuation Assets - The funding value of assets recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased-in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, funding value of assets will tend to be lower than market value. During periods when investment performance is less than the assumed rate, funding value of assets will tend to be greater than market value. The funding value of assets is unbiased with respect to market value. At any time it may be either greater or less than market value.

System assets are reported to the actuary in total. Reported investment income is allocated among the various employment divisions such that the rate of return for each division is the same as the rate of return for the entire System.

Actuarial Assumptions Used for the Valuation

Investment Return (net of expenses): 7.25% per year compounded annually. The assumed rate of investment return is the rate of return in excess of either wage or price inflation. Considering a wage inflation assumption of 3.25% per year, the 7.25% nominal return translates into a real rate of return of 4.00% per year in excess of wage inflation.

This assumption is used to equate the value of payments due at different points in time and was first used for the September 30, 2015 valuation.

Net market value rates of investment return during the last 5 plan years are shown below:

	For the Year Ending September 30th				
	2019	**2018**	**2017**	**2016**	**2015**
Rate of Investment Return	3.65%	6.52%	11.35%	9.11%	0.63%

Pay Projections: These assumptions are used to project current pays to those upon which benefits will be based. The base economic assumption was first used for the September 30, 2015 valuation.

	Annual Rate of Pay Increase for Sample Ages						
	General County Members				Sheriff's Department		
Sample Ages	Base (Economic)	Merit & Longevity	Total	Years of Service	Base (Economic)	Merit & Longevity	Total
20	3.25%	4.00%	7.25%	1 to 7	3.25%	6.00%	9.25%
25	3.25	3.00	6.25	8 to 15	3.25	3.00	6.25
30	3.25	2.00	5.25	thereafter	3.25	0.00	3.25
35	3.25	2.00	5.25				
40	3.25	1.00	4.25				
45	3.25	1.00	4.25				
50	3.25	0.50	3.75				
55	3.25	0.50	3.75				
60	3.25	0.25	3.50				

Price Inflation: 2.75% per year.

Actuarial Assumptions Used for the Valuation

Lump Sum Payments: Lump sum payments for unused sick leave and vacation were assumed to increase final average compensation for the present members by 1%.

Mortality: The RP-2014 Healthy Annuitant Mortality Table (unadjusted) projected to 2021 using a static projection based on the 2-dimensional MP-2014 improvement scales. This assumption was first used for the September 30, 2015 valuation. Sample values follow:

Sample Ages	Actuarial Present Value of $1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	$147.31	$151.52	33.50	36.20
55	140.72	145.66	29.15	31.69
60	132.68	138.11	24.96	27.26
65	122.70	128.61	20.91	22.97
70	110.60	117.00	17.05	18.88
75	96.35	103.26	13.44	15.06
80	80.32	87.66	10.17	11.58

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. The membership size in this group is not sufficiently large to determine if there is a margin for mortality improvements. However, based upon our experience with a broad cross section of public sector plans similar in nature to this plan, it is our opinion that there is a provision for future mortality improvement in the current mortality assumption.

Actuarial Assumptions Used for the Valuation

Rates of Separation from Active Membership: The rates do not apply to members eligible to retire and do not include separation on account of death or disability. This assumption measures the probabilities of members remaining in employment.

Sample Ages	Percent of Active Members Separating within Next Year	
	General	Sheriffs
20	5.00%	4.00%
25	5.00	4.00
30	4.00	3.40
35	4.00	2.50
40	3.00	1.80
45	3.00	1.30
50	2.00	0.80
55	1.00	0.40
60	0.50	0.10
65	0.50	0.00

The rates were first used for the September 30, 2007 valuation.

Rates of Disability: These rates represent the probabilities of active members becoming disabled.

Sample Ages	Percent Becoming Disabled within Next Year	
	General	Sheriffs
20	0.02%	0.14%
25	0.02	0.15
30	0.04	0.18
35	0.06	0.23
40	0.16	0.30
45	0.19	0.51
50	0.31	1.00
55	0.71	1.55

These rates were first used for the December 31, 1992 valuation.

Actuarial Assumptions Used for the Valuation

Rates of Retirement: These rates are used to measure the probabilities of an eligible member retiring during the next year.

Percent of Active Members Retiring within One Year					
General County		**Sheriff's Department**			
Ages	**%**	**Ages**	**%**	**Service**	**%**
55	20%	60	20%	25	40%
56	15	61	40	26	35
57	15	62	70	27	35
58	15	63	50	28	35
59	15	64	50	29	35
60	20	65	100	30	40
61	15			31	40
62	25			32	50
63	15			33	70
64	15			34	70
65	35			35	100
66	40				
67	50				
68	70				
69	80				
70	100				

A member was assumed to be eligible for retirement after attaining age 55 with 25 or more years of service (after 25 years of service regardless of age for Deputies and Command Officers), or age 60 with 8 or more years of service.

The rates were first used for the September 30, 2007 valuation.

Glossary

Actuarial Accrued Liability - The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability." Under the actuarial cost method used the "AAL" differs somewhat from the value of future payments based on benefits earned as of the valuation date.

Accrued Service - The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions - Estimates of future plan experience with respect to rates of mortality, disability, retirement, investment income and salary increases. Decrement assumptions (rates of mortality, separation and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic 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.

Actuarial Cost Method - A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the normal costs to be paid in the future and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

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.

Amortization - Paying off an interest-bearing liability by means of periodic contributions of interest and principal, as opposed to a lump sum payment.

Glossary

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.

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 in addition to the normal cost.

Plan Termination Liability - The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for the future service and salary. The termination liability will generally be less than the liabilities computed on a "going-concern" basis and is not normally determined in a routine actuarial valuation.

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 - The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets - The value of current plan assets recognized for valuation purposes.

SECTION E

OTHER FINANCIAL DISCLOSURES

Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Entry Age Accrued Liability (b)	Unfunded AAL (UAAL) (b) – (a)	Funded Ratio (a) / (b)	Valuation Payroll (c)	UAAL as a Percentage of Valuation Payroll [(b) – (a)] / (c)
9/30/2010#	$745,094,735	$692,409,285	$ (52,685,450)	107.6 %	$42,686,155	- -
9/30/2011	727,690,746	712,159,061	(15,531,685)	102.2	38,275,780	- -
9/30/2012	717,654,902	713,972,065	(3,682,837)	100.5	33,706,963	- -
9/30/2013	716,944,068	719,348,810	2,404,742	99.7	29,498,703	8.15 %
9/30/2014#	787,896,080	726,487,842	(61,408,238)	108.5	26,271,160	- -
9/30/2015#	786,151,565	760,839,312	(25,312,253)	103.3	23,739,756	- -
9/30/2016	779,685,235	762,520,988	(17,164,247)	102.3	20,976,409	- -
9/30/2017	776,357,214	757,006,989	(19,350,225)	102.6	18,113,662	- -
9/30/2018	769,933,304	752,661,840	(17,271,464)	102.3	14,309,870	- -
9/30/2019	755,848,393	747,510,886	(8,337,507)	101.1	11,941,422	- -

\# *Assumption/method change*

Schedule of Employer Contributions

Actuarial Valuation Date	Fiscal Year Beginning	Annual Required Contribution	Percentage Contributed
9/30/2010	10/1/2011	$ 3,279,107	100.00 %
9/30/2011	10/1/2012	5,400,095	100.00
9/30/2012	10/1/2013	5,770,835	100.00
9/30/2013	10/1/2014	4,554,832	100.00
9/30/2014	10/1/2015	0	100.00
9/30/2015	10/1/2016	0	100.00
9/30/2016	10/1/2017	0	100.00
9/30/2017	10/1/2018	0	100.00
9/30/2018	10/1/2019	0	100.00
9/30/2019	10/1/2020	0	

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800.521.0498 | P: 248.799.9000 | www.grsconsulting.com

February 19, 2020

Ms. Silvia Frank
Retirement System Secretary
Oakland County Employees'
Retirement System
2100 Pontiac Lake Road
Waterford, MI 48328-0440

Dear Silvia:

Enclosed is a copy of the report of the most recent annual actuarial valuation of the pension liabilities covering the Oakland County Employees' Retirement System.

Sincerely,

Louise Gates

Louise M. Gates

Enclosure

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723