

City of Royal Oak Retirement System

GASB Statement Nos. 67 and 68 Accounting and
Financial Reporting for Pensions

June 30, 2017



September 26, 2017

Board of Trustees
City of Royal Oak Retirement System

Dear Board Members:

This report provides accounting and financial reporting information that is intended to comply with the Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 for the City of Royal Oak Retirement System. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

GASB Statement No. 67 is the accounting standard that applies to the stand-alone financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is not an appropriate measure for assessing the need for or amount of future employer contributions. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than the City of Royal Oak Retirement System only in its entirety and only with the permission of the City. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by the City, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This information was checked for internal consistency, but it was not audited.

To the best of our knowledge, the information contained in this report is accurate and fairly represents the actuarial position of the City of Royal Oak Retirement System. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Mark Buis and James D. Anderson are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,


Mark Buis, FSA, EA, FCA, MAAA

MB/JDA:dj

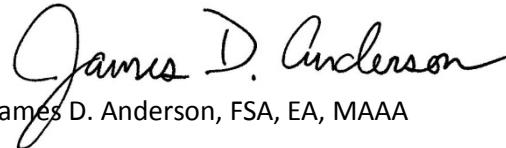

James D. Anderson, FSA, EA, MAAA

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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2017

	2017	
Actuarial Valuation Date	June 30, 2016	
Measurement Date of the Net Pension Liability	June 30, 2017	
Employer's Fiscal Year Ending Date (Reporting Date)	June 30, 2017	
Membership		
Number of		
- Retirees and Beneficiaries	548	
- Inactive, Nonretired Members	25	
- Active Members	231	
- Total	<hr/> 804	
Covered Payroll	\$ 16,024,376	
Net Pension Liability		
Total Pension Liability	\$ 216,591,581	
Plan Fiduciary Net Position	<hr/> 154,892,353	
Net Pension Liability	\$ 61,699,228	
Plan Fiduciary Net Position as a Percentage		
of Total Pension Liability	71.51%	
Net Pension Liability as a Percentage		
of Covered Payroll	385.03%	
Development of the Single Discount Rate		
Single Discount Rate	7.75%	
Long-Term Expected Rate of Investment Return	7.75%	
Long-Term Municipal Bond Rate*	3.56%	
Last year ending June 30 in the 2018 to 2117 projection period		
for which projected benefit payments are fully funded	2117	
Total Pension Expense	\$ 12,340,294	
Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses		
	Deferred Outflows	Deferred Inflows
	of Resources	of Resources
Difference between expected and actual experience	\$ 3,622,413	\$ -
Changes in assumptions	-	-
Net difference between projected and actual earnings		
on pension plan investments	10,568,870	5,233,808
Total	<hr/> \$ 14,191,283	\$ 5,233,808

* Source: *Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2017. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to the System subsequent to the measurement date of June 30, 2017.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans, to include certain additional information. The list of disclosure items should include:

- a description of benefits provided by the plan;
- the type of employees and number of members covered by the pension plan;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- the pension plan's fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of how fair value is determined;
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- annual money-weighted rate of return.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll; and
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.75% on the actuarial value of assets), then the following outcomes are expected:

1. The employer normal cost as a percentage of pay is expected to remain level as a percentage of payroll.
2. The unfunded liability is expected to be paid off in approximately 27 years, which is the number of years remaining in the closed amortization schedule of the unfunded liability for the Police and Fire group.
3. The funded status of the plan is expected to reach a 100% funded ratio in approximately 27 years, which is the number of years remaining in the closed amortization schedule of the unfunded liability for the Police and Fire group.

This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2117. The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2016 and a measurement date of June 30, 2017.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects: 1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits); and 2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.75%; the municipal bond rate is 3.56% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 7.75%.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013 and June 15, 2014, respectively.

SECTION B

FINANCIAL STATEMENTS

Auditor's Note – This information is intended to assist in preparation of the financial statements of the City of Royal Oak Retirement System. Financial statements are the responsibility of management, subject to the auditor's review. Please let us know if the auditor recommends any changes.

Pension Expense Under GASB Statement No. 68

Fiscal Year Ended June 30, 2017

A. Expense

1. Service Cost	\$ 2,517,235
2. Interest on the Total Pension Liability	15,791,337
3. Current-Period Benefit Changes	0
4. Employee Contributions (made negative for addition here)	(952,984)
5. Projected Earnings on Plan Investments (made negative for addition here)	(10,196,983)
6. Pension Plan Administrative Expense	197,433
7. Other Changes in Plan Fiduciary Net Position	(134,721)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	2,499,405
9. Recognition of Outflow (Inflow) of Resources due to Assets	
10. Total Pension Expense	\$ 12,340,294

Statement of Outflows and Inflows Arising from the Current Reporting Period Fiscal Year Ended June 30, 2017

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ 3,951,131
2. Assumption Changes (gains) or losses	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	2.9457
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$ 1,341,322
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ -
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	<hr/> \$ 1,341,322
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	\$ 2,609,809
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$ -
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	<hr/> \$ 2,609,809

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (6,542,260)
2. Recognition period for Assets {in years}	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$ (1,308,452)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (5,233,808)

Statement of Outflows and Inflows Arising from the Current and Prior Reporting Periods Fiscal Year Ended June 30, 2017

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	\$ 2,499,405	\$ -	\$ 2,499,405
2. Due to Assets	3,928,024	1,308,452	2,619,572
3. Total	\$ 6,427,429	\$ 1,308,452	\$ 5,118,977

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 2,499,405	\$ -	\$ 2,499,405
2. Assumption Changes	-	-	-
3. Net difference between projected and actual earnings on pension plan investments	3,928,024	1,308,452	2,619,572
4. Total	\$ 6,427,429	\$ 1,308,452	\$ 5,118,977

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 3,622,413	\$ -	\$ 3,622,413
2. Assumption Changes	-	-	-
3. Net difference between projected and actual earnings on pension plan investments	10,568,870	5,233,808	5,335,062
4. Total	\$ 14,191,283	\$ 5,233,808	\$ 8,957,475

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2018	\$ 4,882,100
2019	3,979,455
2020	1,404,372
2021	(1,308,452)
2022	-
Thereafter	-
Total	\$ 8,957,475

Statement of Fiduciary Net Position as of June 30, 2017

	<u>2017</u>
Assets	
Cash and Deposits	\$ 761,126
Receivables	
Accounts Receivable - Sale of Investments	\$ -
Accrued Interest and Other Dividends	74,430
Contributions	-
Accounts Receivable - Other	-
Total Receivables	<u>\$ 74,430</u>
Investments	
Fixed Income	\$ -
Mutual Funds	154,402,946
International Equities	-
Real Estate	-
Other	-
Total Investments	<u>\$ 154,402,946</u>
Total Assets	<u>\$ 155,238,502</u>
Liabilities	
Payables	
Accounts Payable - Purchase of Investments	\$ -
Accrued Expenses	346,149
Accounts Payable - Other	-
Total Liabilities	<u>\$ 346,149</u>
Net Position Restricted for Pensions	<u>\$ 154,892,353</u>

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2017

	<u>2017</u>
Additions	
Contributions	
Employer*	\$ 28,605,368
Employee	952,984
Other (includes service purchases)	<u>111,902</u>
Total Contributions	<u>\$ 29,670,254</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 15,052,537
Interest and Dividends	2,437,049
Less Investment Expense	<u>(750,343)</u>
Net Investment Income	<u>\$ 16,739,243</u>
Other	
Total Additions	<u>\$ 46,432,316</u>
Deductions	
Benefit payments, including refunds of employee contributions	\$ 16,337,378
Pension Plan Expenses	197,433
Other	<u>-</u>
Total Deductions	<u>\$ 16,534,811</u>
Net Increase in Net Position	<u>\$ 29,897,505</u>
Net Position Restricted for Pensions	
Beginning of Year	\$ 124,994,848
End of Year	<u>\$ 154,892,353</u>

* Includes \$21,427,286 from February 2017 issuance of bonds.

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in the Net Pension Liability and Related Ratios

Fiscal Year Ended June 30, 2017

A. Total Pension Liability

1. Service Cost	\$ 2,517,235
2. Interest on the Total Pension Liability	15,791,337
3. Changes of benefit terms	-
4. Difference between expected and actual experience of the Total Pension Liability	3,951,131
5. Changes of assumptions	-
6. Benefit payments, including refunds of employee contributions	<u>(16,337,378)</u>
7. Net change in Total Pension Liability	\$ 5,922,325
8. Total Pension Liability – Beginning	<u>210,669,256</u>
9. Total Pension Liability – Ending	<u>\$ 216,591,581</u>

B. Plan Fiduciary Net Position

1. Contributions – Employer*	\$ 28,605,368
2. Contributions – Employee	952,984
3. Net investment income	16,739,243
4. Benefit payments, including refunds of employee contributions	<u>(16,337,378)</u>
5. Pension Plan Administrative Expense	<u>(197,433)</u>
6. Other	<u>134,721</u>
7. Net change in Plan Fiduciary Net Position	\$ 29,897,505
8. Plan Fiduciary Net Position – Beginning	<u>124,994,848</u>
9. Plan Fiduciary Net Position – Ending	<u>\$ 154,892,353</u>

C. Net Pension Liability

D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability	71.51%
E. Covered-Employee Payroll	\$ 16,024,376

F. Net Pension Liability as a Percentage of Covered-Employee Payroll	385.03%
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* Includes \$21,427,286 from February 2017 issuance of bonds.

Schedules of Required Supplementary Information

Schedule of Changes in the Employers' Net Pension Liability and Related Ratios

**Ultimately 10 Fiscal Years will be displayed
(which may be built prospectively starting from 2014)**

Fiscal year ending June 30,	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Pension Liability										
Service Cost	\$ 2,517,235	\$ 2,542,348	\$ 2,555,924	\$ 2,485,567						
Interest on the Total Pension Liability	15,791,337	15,445,529	15,214,726	15,021,782						
Benefit Changes	-	-	96,556	-						
Difference between expected and actual experience of the Total Pension Liability	3,951,131	2,710,293	903,595	-						
Assumption Changes	-	-	-	-						
Benefit Payments and Refunds	(16,337,378)	(16,109,768)	(15,462,071)	(14,643,773)						
Net Change in Total Pension Liability	5,922,325	4,588,402	3,308,730	2,863,576						
Total Pension Liability - Beginning	210,669,256	206,080,854	202,772,124	199,908,548						
Total Pension Liability - Ending (a)	\$ 216,591,581	\$ 210,669,256	\$ 206,080,854	\$ 202,772,124						
Plan Fiduciary Net Position										
Employer Contributions*	\$ 28,605,368	\$ 6,722,192	\$ 7,098,292	\$ 6,503,436						
Employee Contributions	952,984	900,697	885,068	904,706						
Pension Plan Net Investment Income	16,739,243	(3,321,488)	4,433,190	22,648,250						
Benefit Payments and Refunds	(16,337,378)	(16,109,768)	(15,462,071)	(14,643,773)						
Pension Plan Administrative Expense	(197,433)	(99,671)	(71,374)	(943,533)						
Other	134,721	262,131	129,249	718,837						
Net Change in Plan Fiduciary Net Position	29,897,505	(11,645,907)	(2,987,646)	15,187,923						
Plan Fiduciary Net Position - Beginning**	124,994,848	136,325,205	139,312,850	124,075,187						
Plan Fiduciary Net Position - Ending (b)	\$ 154,892,353	\$ 124,679,298	\$ 136,325,204	\$ 139,263,110						
Net Pension Liability - Ending (a) - (b)	61,699,228	85,989,958	69,755,650	63,509,014						
Plan Fiduciary Net Position as a Percentage										
of Total Pension Liability	71.51 %	59.18 %	66.15 %	68.68 %						
Covered-Employee Payroll	\$ 16,024,376	\$ 15,845,062	\$ 19,494,353	\$ 15,296,167						
Net Pension Liability as a Percentage										
of Covered-Employee Payroll	385.03 %	542.69 %	357.82 %	415.20 %						

Notes to Schedule:

N/A

* Includes \$21,427,286 from February 2017 issuance of bonds.

** Beginning of year Plan Fiduciary Net Position was revised in years 2015, 2016, and 2017.

Schedules of Required Supplementary Information

Schedule of the Employers' Net Pension Liability

**Ultimately 10 Fiscal Years will be displayed
(which may be built prospectively starting from 2014)**

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2008						
2009						
2010						
2011						
2012						
2013						
2014	\$202,772,124	\$139,263,110	\$63,509,014	68.68%	\$15,296,167	415.20%
2015	206,080,854	136,325,204	69,755,650	66.15%	19,494,353	357.82%
2016	210,669,256	124,679,298	85,989,958	59.18%	15,845,062	542.69%
2017	216,591,581	154,892,353	61,699,228	71.51%	16,024,376	385.03%

Schedule of Contributions

**Ultimately 10 Fiscal Years will be displayed
(which may be built prospectively starting from 2014)**

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2008					
2009					
2010					
2011					
2012					
2013					
2014	\$ 6,480,707	\$ 6,503,436	\$ (22,729)	\$ 15,296,167	42.52%
2015	6,891,898	7,098,292	(206,394)	19,494,353	36.41%
2016	6,852,495	6,722,192	130,303	15,845,062	42.42%
2017	7,009,728	28,605,368 *	(21,595,640)	16,024,376	178.51%

** Includes \$21,427,286 from February 2017 issuance of bonds.*

Notes to Schedule of Contributions

Valuation Date: June 30, 2016

Methods and Assumptions Used to Determine Contribution Rates:

Actuarial Cost Method	Entry-Age Normal
Amortization Method	General: Level dollar amount, closed Police and Fire: Level percent-of-payroll, closed
Remaining Amortization Period	General: 22 years, closed Police and Fire: 27 years, closed
Asset Valuation Method	4-Year smoothed market
Inflation	3.0%
Salary Increases	3.0% - 5.9%
Investment Rate of Return	7.75%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2013 valuation pursuant to an experience study of the period 2006 - 2012.
Mortality	RP-2000 projected 20 years (multiplied by 110%) Healthy Life Mortality, set forward 10 years for Disabled Life Mortality.

Schedule of Investment Returns

Ultimately 10 Fiscal Years will be displayed
(which may be built prospectively starting from 2014)

FY Ending June 30,	Annual Return¹
2008	
2009	
2010	
2011	
2012	
2013	
2014	17.98 %
2015	3.24 %
2016	(2.39)%
2017	13.09 %

¹ Annual money-weighted rate of return, net of investment expenses.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Long-Term Expected Return on Plan Assets

The assumed rate of investment return was adopted by the plan's trustees after considering input from the plan's investment consultant(s). Additional information about the assumed rate of investment return is included in our actuarial valuation report as of June 30, 2016.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These real rates of return are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. For each major asset class that is included in the pension plan's target asset allocation as of June 30, 2016, these arithmetic best estimates are summarized in the following table:

Asset Class	Target Allocation	Asset Allocation	Long-Term Expected Real Rate of Return*
		Long-Term Expected Real Rate of Return*	
World Equity	19.00%	6.83%	
Core Fixed Income	13.00%	4.04%	
Opportunistic Income Fund	12.00%	3.39%	
Large Cap Index	20.00%	5.50%	
Dynamic Asset Allocation	8.00%	7.82%	
Small Cap	8.00%	5.50%	
Emerging Markets Debt	6.00%	6.25%	
Core Property	5.00%	4.80%	
Emerging Markets Equity	5.00%	7.17%	
High Yield	4.00%	5.32%	
Total	100.00%		

* Based on inflation of 2.5%.

The figures in the above table were supplied by the City of Royal Oak Retirement System. Gabriel, Roeder, Smith & Company does not provide investment advice.

Single Discount Rate

A Single Discount Rate of 7.75% was used to measure the total pension liability. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.75%. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.75%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of the Net Pension Liability to the Single Discount Rate Assumption

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
	6.75%	7.75%	8.75%
Total Pension Liability	\$ 238,850,264	\$ 216,591,581	\$ 197,651,805
Plan Fiduciary Net Position	154,892,353	154,892,353	154,892,353
Net Pension Liability/(Asset)	\$ 83,957,911	\$ 61,699,228	\$ 42,759,452

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	548
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	25
Active Plan Members	231
Total Plan Members	804

SECTION E

SUMMARY OF BENEFITS

Summary of Benefit Provisions Evaluated

June 30, 2017

Regular Retirement (no reduction factor for age):

The benefit amounts attributable to regular retirements and the conditions under which such benefits may be paid are described in tabular form on page 23.

Deferred Retirement (vested benefit):

Eligibility:

AFSCME, Executive Department Heads, Department Heads and Deputies, Professional and Technical, 44th District Court, SEIU AFL-CIO Local 517M, Supervisors, Police Service Aides: 5 years of service.

Police Officers, Police Command, Detectives, Fire Fighters: 10 years of service.

Annual Amount:

Same as regular retirement but based upon service and final average compensation at time of termination.

AFSCME, Executive Department Heads, Department Heads and Deputies, Professional & Technical, 44th District Court, Police Service Aides: Payable at age 55 with 25 years of service or age 60 with 5 years of service.

Supervisors, SEIU AFL-CIO Local 517M: Payable at age 50 with 30 years of service or age 60 with 5 years of service.

Police Officers, Police Command, Detectives, Fire Fighters: Payable at age 55 with 10 years of service.

Duty Death Before Retirement:

Eligibility - No age or service requirements.

Annual Amount - Computed as regular retirement but with additional service credit from date of death until date age 60 would have been attained. Spouse is paid 75% of regular retirement benefit; 1 or 2 unmarried children under age 19 are paid 10% of regular retirement benefit per child; 3 or more unmarried children under age 19 are paid an equal share of 25% of regular retirement benefit. Worker's Compensation payments are offset.

Non-Duty Death Before Retirement:

Eligibility - 3 years of service.

Annual Amount - Same as duty death before retirement.

Summary of Benefit Provisions Evaluated

June 30, 2017

Duty Disability Retirement:

Eligibility - No age or service requirements.

Annual Amount -

AFSCME: 66-2/3% of base monthly salary at time of disability, with recomputation to 70% after 5 years of disability and 75% after 10 years. Benefit is payable until attaining minimum retirement requirements.

Executive Department Heads, Department Heads & Deputies: 66% of base monthly salary at time of disability. Benefit is payable until voluntary retirement age.

Professional & Technical, 44th District Court, Supervisors, and SEIU AFL-CIO Local 517M: 66-2/3% of base monthly salary at time of disability. Benefit is payable until voluntary retirement age for Professional & Technical and Supervisors, and until age 60 for SEIU AFL-CIO Local 517M.

Police Officers, Police Command, Detectives, Police Service Aides: 66-2/3% of base monthly salary, where salary is adjusted for negotiated pay increases for physical disabilities and remains the salary at the time of disability for psychological disabilities. Workers' compensation is offset. Benefit is payable until age 55 for Police Officers, Police Command, and Detectives and until age 60 for Police Service Aides.

Fire Fighters: 66-2/3% of base monthly salary at time of disability. Worker's Compensation is offset. Benefit is payable until voluntary retirement age.

Duty Disability Maximum Monthly Benefit -

Executive Department Heads, Department Heads & Deputies:	\$5,000
Professional & Technical, 44 th District Court:	\$3,500
AFSCME, SEIU AFL-CIO Local 517M, Supervisors, Police Officers, Police Command, Detectives, Police Service Aides, Fire Fighters:	No maximum

Non-Duty Disability Retirement:

Eligibility -

SEIU AFL-CIO Local 517M: 10 years of service.

AFSCME, Executive Department Heads, Department Heads and Deputies, Professional and Technical, 44th District Court, Supervisors, Police Officers, Police Command, Detectives, Police Service Aides, Fire Fighters: 5 years of service.

Annual Amount -

AFSCME: 66-2/3% of base monthly salary at time of disability. Benefit is payable until attaining minimum retirement requirements.

Fire Fighters: 50% of base monthly salary at time of disability. Benefits are payable the same as duty disability.

Executive Department Heads, Department Heads and Deputies, Professional and Technical, Local 270M, Supervisors, Police Officers, Police Command, Police Service Aides, Detectives: Benefits are the same as duty disability.

Summary of Benefit Provisions Evaluated

June 30, 2017

Automatic Death Benefit After Retirement:

75% of a retiree's straight life pension will be continued to an eligible surviving spouse upon retiree's death with no corresponding reduction in straight life pension.

Lump Sum Death Benefit After Retirement:

\$4,000 for all divisions.

Annuity Withdrawal:

Members may withdraw their accumulated member contributions upon retirement with a corresponding reduction in pension amount.

Covered Compensation:

AFSCME, Executive Department Heads, Department Heads and Deputies, Professional and Technical, Local 270M, Supervisors: Covered compensation includes base salary, longevity and up to 96 hours of sick leave incentive pay.

Police Command: Covered compensation includes base salary, longevity, payment in lieu of holidays, personal business (up to 120 hours) and vacation (up to 200 hours).

Fire Fighters: Covered compensation includes base salary, longevity, payment in lieu of holidays, uniform allowance, cleaning allowance, food allowance, sick pay, paramedic premium, personal business (24 hours) and vacation.

Police Officers, Police Service Aides: Covered compensation includes base salary, longevity, payment in lieu of holidays, up to 120 hours of sick and personal business days, and up to 200 hours from the vacation bank.

Detectives: Covered compensation includes base salary, longevity and payment in lieu of holidays, 24 personal business hours, up to 96 hours sick leave incentive pay and up to 200 hours from the vacation bank.

Summary of Benefit Provisions Evaluated

June 30, 2017

Group	Code	Eligibility	Benefit Multiplier		Maximum FAS	Years in FAS	Member Contribution Rates		Date of Closure to New Hires
			Date of Change	Benefit Formula			To Social Security Wage Base	Over Social Security Wage Base	
Executive Department Heads	10	Age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 7/1/2010 After 6/30/2010	2.5% for 20 yrs., 2.2% after 2.3% for 20 yrs., 2.0% after	80%^	2	5.00%	7.00%	5/1/2008
SEIU AFL-CIO Local 517M	11	Any age & 30 yrs., or age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 7/1/2011 After 6/30/2011	2.5% for 20 yrs., 2.2% after 2.25% for first 10 yrs., 2.5% for next 10 yrs., 2.2% after	75%	2	7.00%	9.00%	7/1/2006
Department Heads and Deputies	12	Age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 9/1/2011 After 8/31/2011	2.5% for 20 yrs., 2.2% after 2.25% for 20 yrs., 2.2% after	80%^	2	5.00%	7.00%	7/1/2008
44th District Court	13	Age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 1/1/2012 After 12/30/2011	2.5% for 20 yrs., 2.2% after 2.25% for 20 yrs., 2.2% after	75%	2	4.00%	4.00%	7/1/2007
Professional and Technical	33	Age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 7/1/2011 After 6/30/2011	2.5% for 20 yrs., 2.2% after 2.25% for 20 yrs., 2.2% after	80%^	2	5.00%	7.00%	7/1/2007
TPOAM (AFSCME)	14	Age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 9/1/2011 After 8/31/2011	2.5% for 20 yrs., 2.2% after 2.25% for 20 yrs., 2.2% after***	80%^	2	4.50%	6.50%	7/1/2005
Foremen and Supervisors	15	Age 50 & 30 yrs., or age 50 & 25 yrs., or age 55 & 20 yrs., or age 60 & 5 yrs.	Before 9/14/2011 After 9/13/2011	2.5% for 20 yrs., 2.2% after 2.25% for first 10 yrs., 2.5% for next 10 yrs., 2.2% after	80%^	2	7.00%	7.00%	7/1/2006
Police Service Aides	22	Age 55 & 20 yrs., or age 60 & 5 yrs., or age 50 & 25 yrs.		2.5% for 20 yrs., 2.2% after	80%	2	4.00%	6.00%	
Police Officers	92			2.8% for all yrs.	80%^	2	6.00%	6.00%	
Hired before 6/1/2012		Any age & 25 yrs., or age 55 & 10 yrs.		2.8% for all yrs.	80%^	2	6.00%	6.00%	
Hired after 5/30/2012		Any age & 25 yrs.*, or age 55 & 10 yrs.		2.5% for all yrs.	80%^	3	6.00%	6.00%	
Fire Fighters	93			2.8% for all yrs.	75%	2	6.00%	6.00%	
Hired before 10/1/2009		Any age & 25 yrs., or age 55 & 10 yrs.		2.8% for all yrs.	75%	2	6.00%	6.00%	
Hired after 9/30/2009		Age 50 & 25 yrs., or age 55 & 10 yrs.**		2.5% for all yrs.	75%	3	6.00%	6.00%	
Police Command	94	Any age & 25 yrs., or age 55 & 10 yrs.		2.8% for all yrs.	80%^	2	6.00%	6.00%	
Detectives	95	Any age & 25 yrs., or age 55 & 10 yrs.		2.8% for all yrs.	80%	2	6.00%	6.00%	
Fire Department Heads	96	Any age & 25 yrs., or age 55 & 10 yrs.		2.8% for all yrs.	75%	2	6.00%	6.00%	
Police Department Heads	97	Any age & 25 yrs., or age 55 & 10 yrs.		2.8% for all yrs.	80%^	2	6.00%	6.00%	

* For Police Officers hired after 5/30/2012, a member must have at least 25 years of actual service to be eligible to retire and receive a pension.
This is actual service and does not include the purchase of service time.

** For Fire Fighters hired after 9/30/2009, service for eligibility must be actual service and does not include the purchase of service time.

*** Service time previously purchased will be computed utilizing the multiplier in effect at the time of purchase.

^ 1% multiplier after 75% up to 80%.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Valuation Methods

Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an individual **entry-age normal cost** valuation method having the following characteristics:

- the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
- each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

Financing of Unfunded Actuarial Accrued Liabilities: Unfunded actuarial accrued liabilities were amortized by level (principal & interest combined) percent-of-payroll contributions over a period of 27 years for the Police and Firefighter plans and a 22-year level dollar amount for the General and Water plans.

Actuarial Assumptions Used in the Valuation

The actuary calculates the contribution requirements and benefit values of the plan by applying actuarial assumptions to the benefit provisions and census data furnished, using the valuation method described on page 24.

The principal areas of financial risk which require assumptions about future experience are:

- long-term rates of investment income
- patterns of salary increases
- rates of mortality before and after retirement
- rates of withdrawal from active membership
- rates of disability among members and their subsequent rates of recovery
- probabilities of retirement at various ages after benefit eligibility

In a valuation the monetary effect of each assumption, for each distinct experience group, is projected for the next year and for each year over the next half-century or longer.

Actual experience will not coincide exactly with assumed experience, regardless of the skill of the actuary, the completeness of the data and the precision of the many calculations that are made. Each valuation provides a complete recalculation of system obligations based upon assumptions regarding future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of small adjustments of the computed contribution rate.

From time-to-time it is appropriate to modify one or more of the assumptions to reflect basic experience trends (but not random year-to-year fluctuations).

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

Sample Ages	Annual Rate of Salary Increase for Sample Age		
	Base (Economic)	Merit & Longevity	
		General, Water & Police Service Aids	Police-Fire
20	3.0%	2.9%	2.3%
25	3.0%	2.3%	2.3%
30	3.0%	2.0%	2.3%
35	3.0%	1.8%	1.6%
40	3.0%	1.6%	0.6%
45	3.0%	1.3%	0.2%
50	3.0%	0.9%	0.1%
55	3.0%	0.5%	0.0%
60	3.0%	0.1%	0.0%
65	3.0%	-	-
Ref		417	418

The rate of investment return was 7.75% per year, compounded annually, net after administrative and investment expenses. This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time.

The assumed real return for funding purposes is the net rate of return in excess of average salary increases. Considering other assumptions used in the valuation, the 7.75% translates to a real return of approximately 4.75%.

	Year Ending June 30					5-Year Average
	2016	2015	2014	2013	2012	
(1) Nominal rate*	7.2 %	7.9 %	9.4 %	6.9 %	6.2 %	7.5 %
(2) Increase in CPI	1.0 %	0.1 %	2.1 %	1.8 %	1.7 %	1.3 %
(3) Average salary increase	2.4 %	2.3 %	(0.6)%	(4.3)%	(1.8)%	(0.4)%
(4) Real return						
- investment purposes						6.2 %
- funding purposes						7.9 %

* The nominal rate of return was computed using the approximate formula: $i = I \text{ divided by } 1/2 (A+B-I)$, where I is recognized investment income, A is the beginning of year funding value and B is the end of year funding value.

The mortality table used was the RP-2000 Mortality Table, projected 20 years (multiplied by 110%). This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. Rates for disabled members were set-forward 10 years.

Sample Attained	Single Life Retirement Values				
	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		
	Ages	Men	Women	Men	Women
50	\$140.84	\$142.50	31.97	33.76	
55	133.42	135.62	27.27	29.03	
60	123.85	126.91	22.72	24.49	
65	112.22	116.44	18.47	20.24	
70	98.78	104.40	14.58	16.34	
75	83.03	90.78	11.01	12.82	
80	66.03	75.55	7.93	9.66	
Ref.	454	x 1.10	455	x 1.10	

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

Retirement Ages	General	Police Service Aides	Fire Hired Before 10/1/09 & All Police	Fire Hired After 10/1/09
45-49				
50	20%	20%		40%
51	15%	15%		40%
52	15%	15%		40%
53	15%	15%		25%
54	15%	15%		25%
55	15%	15%	25%	25%
56	15%	15%	25%	25%
57	15%	15%	25%	25%
58	15%	15%	25%	25%
59	15%	15%	25%	25%
60	15%	15%	25%	25%
61	15%	15%	25%	25%
62	35%	35%	25%	25%
63	20%	20%	25%	25%
64	20%	20%	25%	25%
65	55%	100%	100%	100%
66	45%			
67	45%			
68	45%			
69	45%			
70	100%			
Ref.	2321	2322	2323	2323

Years of Service	Percent of Eligible Active Members Retiring
	All Police, Police and Fire Department Heads, and Fire Hired Before 10/1/09
25	40%
26	40%
27	40%
28	25%
29	25%
30	25%
31	25%
32	25%
33	25%
34	25%
35	25%
36	25%
37	25%
38	25%
39	25%
40	100%

Ref.

2323

A member was assumed to be eligible for retirement after satisfying the following requirements:

Group	Eligibility Requirements for Retirement
SEIU AFL-CIO Local 517M and Foremen & Supervisors	30 years of service regardless of age (age 50 required for Foremen & Supervisors); or 50 years of age with 25 years of service; or 55 years of age with 20 years of service; or 60 years of age with 5 years of service.
Other General & Water	50 years of age with 25 years of service; or 55 years of age with 20 years of service; or 60 years of age with 5 years of service.
All Police, Fire Hired Before 10/1/2009 and Police & Fire Department Heads	25 years of service regardless of age; or 55 years of age with 10 or more years of service.
Fire Hired After 9/30/2009	50 years of age with 25 years of service; or 55 years of age with 10 years of service.
Police Service Aides	50 years of age with 25 years of service; or 55 years of age with 20 years of service; or 60 years of age with 5 or more years of service.

Rates of separation from active membership were as shown below (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 terminating employment before eligibility for an immediate benefit.

Sample Ages	Years of Service	% of Active Members Separating Within Next Year	
		General & Police Service Aids	Police & Fire
ALL	0	12.00%	10.00%
	1	9.00%	7.00%
	2	7.00%	5.00%
	3	5.00%	4.00%
	4	4.50%	3.50%
25	5 & Over	4.50%	3.00%
30		4.00%	2.50%
35		3.50%	1.50%
40		2.50%	1.00%
45		2.00%	0.75%
50		1.50%	0.50%
55		1.00%	0.25%
60		1.00%	0.25%
65		1.00%	0.25%
Ref.		29 1300	30 1301

Rates of disability were as follows. This assumption measures the probability of members retiring with a disability benefit.

Sample Ages	% of Active Members Becoming Disabled Within Next Year		
	General, Water & Police Service Aids		
	Male	Female	Police & Fire
20	0.04%	0.02%	0.08%
25	0.05%	0.03%	0.11%
30	0.05%	0.04%	0.19%
35	0.07%	0.07%	0.23%
40	0.11%	0.10%	0.53%
45	0.16%	0.14%	0.60%
50	0.26%	0.23%	0.71%
55	0.46%	0.38%	0.83%
60	0.77%	0.55%	0.90%
Ref.	33	34	45
Multiplier:	50%	50%	75%

Loading Factor for Final Average Compensation: In the valuation process, a person's salary is assumed to increase by a certain percentage each year (see page 26). However, compensation for benefit purposes includes things such as sick leave incentive pay which are not reported for the valuation. In order to more accurately calculate contribution requirements, the General active normal retirement liabilities were increased by 3.0% to account for the items not reported for valuation purposes, and Police/Fire active normal retirement liabilities were increased by 7.0%. As additional experience emerges, the ratios will be periodically adjusted to better estimate the effect of inclusion of additional items in final average compensation.

Final Average Compensation with and without Extra Compensation Items New General Retirees

Year Ending June 30	Final Average Compensation		Ratio
	With Extras	Without Extras	
2007	\$ 368,581	\$ 359,998	1.024
2008	265,708	257,527	1.032
2009	411,886	397,403	1.036
2010	927,695	909,791	1.02
2011	1,142,006	1,109,451	1.029
2012	399,988	398,597	1.003
2013	166,105	166,105	1.000
2014	555,114	537,827	1.032
2015	672,736	654,355	1.028
2016	306,019	301,092	1.016
Totals	\$5,215,838	\$5,092,146	1.024

Final Average Compensation with and without Extra Compensation Items New Police/Fire Retirees

Year Ending June 30	Final Average Compensation		Ratio
	With Extras	Without Extras	
2007	\$ 529,024	\$ 477,168	1.109
2008	235,078	207,897	1.131
2009	620,166	557,307	1.113
2010	197,108	173,178	1.138
2011	1,455,696	1,280,714	1.137
2012	956,833	840,669	1.138
2013	473,934	418,537	1.132
2014	555,114	537,827	1.032
2015	420,130	378,238	1.111
2016	991,105	873,419	1.135
Totals	\$6,434,189	\$5,744,955	1.120

Miscellaneous and Technical Assumptions

June 30, 2017

Marriage Assumption:

90% of males and 90% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.

Pay Increase Timing:

Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

Pay Annualization:

Reported pay for members with less than twelve contributing months was annualized by the ratio of 12 to the number of contribution months in the year.

Decrement Timing:

Decrements of all types are assumed to occur mid-year.

Eligibility Testing:

Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

Decrement Relativity:

Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

Decrement Operation:

All decrements the first 5 years of service. Only mortality operates during retirement eligibility.

Service Credit Accruals:

It is assumed that members accrue one year of service credit per year.

Loads:

Age and Service Retirement Present Values for General and Police/Fire members were loaded by 3.0% and 7.0% respectively to account for the additional amount included in the FAC due to unused sick time and unused vacation time. An additional loading factor of 3.0% was applied to each division for Annuity Withdrawal paid at retirement in lump sums.

Incidence of Contributions:

Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

Normal Form of Benefit:

A 75% automatic joint and survivor payment is the assumed normal form of benefit for married people.

Benefit Service:

Exact fractional service is used to determine the amount of benefit payable.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The plan net position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.75%; the municipal bond rate is 3.56%; and the resulting SDR is 7.75%.

The City of Royal Oak Retirement System has a long history of adhering to a funding policy with actuarially determined contributions. In addition, the City has a history of fully contributing the actuarially determined contributions to the fund. As a result, the Single Discount Rate is the expected rate of return on pension plan investments (7.75%) and projections have been excluded from this report.

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms

Amortization Payment

The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method

The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments

Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)

A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll

The payroll of employees that are provided with pensions through the pension plan.

Deferred Retirement Option Program (DROP)

A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.

Deferred Inflows and Outflows

The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

Entry Age Actuarial Cost Method (EAN)	The EAN is a cost method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
GASB	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
Fiduciary Net Position	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability (NPL)	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contributing entities.
Normal Cost	The portion of the actuarial present value allocated to a valuation year is called the normal cost. For purposes of application to the requirements of this Statement, the term normal cost is the equivalent of service cost.

Glossary of Terms

Other Postemployment Benefits (OPEB)	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
Total Pension Expense	The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year: <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.