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April 24, 2019

Mr. Scott K. Miller
Deputy Executive Director
Ohio Police & Fire Pension Fund
140 East Town Street
Columbus, OH 43215-5164

Dear Scott:

Presented in this report is certain pension information and collective amounts for contributing employers that the Ohio Police & Fire Pension Fund (OP&F), will need to comply with reporting under the Governmental Accounting Standards Board (GASB) Statement No. 68, which establishes accounting and financial reporting requirements for governmental employers who provide pension benefits to their employees through a trust. This report, which has been prepared as of December 31, 2018, is intended for use by OP&F for financial reporting for fiscal year 2019. The calculations in this report have been made on a basis that is consistent with our understanding of this accounting standard (GASB 68).

The annual GASB 67 valuation, used as the basis for much of the information presented in this report including the Net Pension Liability, was performed as of December 31, 2018. That report utilized information from an actuarial valuation prepared as of January 1, 2018, which was based upon data, furnished by OP&F's staff, concerning active, inactive and retired members along with pertinent financial information. This information was reviewed for completeness and internal consistency, but was not audited by us. The valuation results depend on the integrity of the data. If any of the information is inaccurate or incomplete, our results may be different and our calculations may need to be revised. Please see the actuarial valuation for additional details on the funding requirements for OP&F including actuarial assumptions and methods and the funding policy.

To the best of our knowledge, the information contained in this report is complete and accurate. The calculations were performed by qualified actuaries according to generally accepted actuarial principles and practices, as well as in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board. The calculations are based on the provisions of OP&F as of the Measurement Date, and on actuarial assumptions that are internally consistent and individually reasonable based on the actual experience of OP&F. In addition, the calculations were completed in compliance with applicable law and, in our opinion, meet the requirements of GASB 68.



Mr. Scott K. Miller
April 24, 2019
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These results are only for financial reporting and may not be appropriate for funding purposes or other types of analysis. Calculations for purposes other than satisfying the requirements of GASB 68 may produce significantly different results. Future actuarial results may differ significantly from the current results presented in this report due to such factors as changes in plan experience or changes in economic or demographic assumptions. The effects of such changes are outside the scope of this report.

We, Larry F. Langer, ASA, and Patrice A. Beckham, FSA, are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein. We are available to answer any questions on the material contained in this report or to provide explanations or further details as may be appropriate.

Respectfully submitted,

A handwritten signature in blue ink, consisting of stylized initials 'LL'.

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

A handwritten signature in blue ink, reading 'Patrice Beckham' in a cursive script.

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



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GASB STATEMENT NO. 68

OHIO POLICE & FIRE PENSION FUND

SECTION I - SUMMARY OF PRINCIPAL RESULTS

Valuation Date (VD):	January 1, 2018
Prior Measurement Date:	December 31, 2017
Measurement Date (MD):	December 31, 2018
Membership Data:	
Retirees and Beneficiaries	29,361
Inactive Vested Members	346
Inactive Nonvested Members	3,264
Active Employees	<u>28,212</u>
Total	61,183
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	8.00%
Municipal Bond Index Rate at Prior Measurement Date	3.16%
Municipal Bond Index Rate at Measurement Date	4.13%
Year in which Fiduciary Net Position is Projected to be Depleted	N/A
Single Equivalent Interest Rate at Prior Measurement Date	8.00%
Single Equivalent Interest Rate at Measurement Date	8.00%
Net Pension Liability:	
Total Pension Liability (TPL)	\$22,103,699,175
Fiduciary Net Position (FNP)	<u>13,941,056,807</u>
Net Pension Liability (NPL = TPL – FNP)	\$8,162,642,368
FNP as a percentage of TPL	63.07%
Pension Expense:	\$1,091,174,633
Deferred Outflows of Resources:	\$2,078,638,072
Deferred Inflows of Resources:	\$528,856,412



SECTION II – INTRODUCTION

The Governmental Accounting Standards Board issued Statement No. 68 (GASB 68), “*Accounting and Financial Reporting for Pensions*” in June 2012. GASB 68’s effective date for employers is the first fiscal year beginning after June 15, 2014, which is the fiscal year ending December 31, 2015 for OP&F. The GASB 68 information is for disclosure by contributing employers and the State of Ohio for their fiscal years ending in 2019, including December 31, 2019. The allocation of the collective amounts by employer is performed by OP&F and is not part of this report.

Paragraph 20 of GASB Statement 68 permits the measurement date of the Net Pension Liability reported by a single employer to be “as of” a date no earlier than the end of its prior fiscal year provided that the actuarial valuation used to determine the Net Pension Liability meets the timing requirements of paragraph 22 of GASB 68. This option is available to OP&F which has a fiscal year end of December 31, and therefore, a Measurement Date of December 31, 2018 was used to determine the Net Pension Liability and Pension Expense for the employer’s fiscal year ending December 31, 2019.

This report, prepared as of December 31, 2018 (the Measurement Date), presents information to assist OP&F in providing the required information under GASB 68 to the participating employers. Much of the material provided in this report, including the Net Pension Liability, is based on the results of the GASB 67 report for the Ohio Police & Fire Pension Fund, which was issued April 24, 2019. See that report for more information on the member data, actuarial assumptions and methods used in developing the GASB 67 results.

GASB 68 requires the inclusion of a Net Pension Liability (NPL) on the employer’s Statement of Net Position and a determination of a Pension Expense (PE) in the Notes to the Financial Statements that may bear little relationship to the employer’s funding requirements. In fact, it is possible in some years for the NPL to be an asset or the PE to be an income item. The NPL is set equal to the Total Pension Liability (TPL) minus the Fiduciary Net Position (FNP). The benefit provisions recognized in the calculation of the TPL are summarized in Appendix B.

PE includes amounts for Service Cost (the Normal Cost under Entry Age Normal (EAN) for the year), interest on the TPL, employee contributions, administrative expenses, other cash flows during the year, recognition of increases/decreases in the TPL due to changes in the benefit structure, actual versus expected experience, actuarial assumption changes, and recognition of investment gains/losses. The actual experience and assumption change impacts are recognized over the average expected remaining service life of OP&F membership as of the beginning of the measurement period, while investment gains/losses are recognized equally over five years. The development of the PE is shown in Section III. The unrecognized portions of each year’s experience, assumption changes and investment gains/losses are used to develop Deferred Inflows and Outflows of Resources, which also must be included on the employer’s Statement of Net Position.

Among the items needed for the TPL calculation is a discount rate, as defined by GASB, or a Single Equivalent Interest Rate (SEIR). To determine the SEIR, the FNP must be projected into the future for as



long as there are anticipated benefits payable under the plan's provision applicable to the membership and beneficiaries of OP&F on the Measurement Date. Future contributions were projected to be made at the current levels set in statute. If the FNP is not projected to be depleted at any point in the future, the long-term expected rate of return on plan investments expected to be used to finance the benefit payments may be used as the SEIR.

If, however, the FNP is projected to be depleted at a future measurement date, the SEIR is determined as the single rate that will generate a present value of benefit payments equal to the sum of the present value determined by discounting all projected benefit payments through the date of depletion by the long-term expected rate of return, and the present value determined by discounting those benefits after the date of depletion by a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate (Municipal Bond Index Rate). The rate used, if necessary, for this purpose is the monthly average of the Bond Buyers General Obligation 20-year Municipal Bond Index Rate (formerly published monthly by the Board of Governors of the Federal Reserve System).

Our calculations indicate that the FNP is not projected to be depleted, so the Municipal Bond Index Rate is not used in the determination of the SEIR for either the December 31, 2017 or the December 31, 2018 TPL. The SEIR for both the Measurement Date and the Prior Measurement Date is 8.00%, the long-term assumed rate of return on investments. The SEIR for both the Measurement Date and Prior Measurement Date meets the requirements of GASB 67 and 68.

The FNP projections are based upon OP&F's financial status on the Measurement Date, the indicated set of methods and assumptions, and the requirements of GASB 67 and 68. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on an ongoing plan basis, reflecting the impact of future members. The FNP does include the member and Fund contributions in excess of future new member's normal costs for expected future new members as allowed by the Standard. Therefore, the results of this test do not necessarily indicate whether or not the fund will actually run out of money, the financial condition of OP&F, or OP&F's ability to make benefit payments in future years.

The benefit structure of OP&F includes a Deferred Retirement Option Plan (DROP). For details on the provisions of the DROP, please see Paragraph 30.f.(1) of the GASB 67 report. In accordance with Paragraph 46(d) of GASB 67, the date of entry into the DROP is considered to be the member's retirement date for purpose of attributing the actuarial present value of projected benefit payments.

The sections that follow provide the results of all the required calculations, presented in the order laid out in GASB 68 for note disclosure and Required Supplementary Information (RSI). Some of this information was provided by OP&F for use in this report. These sections, not prepared by Cavanaugh Macdonald LLC or prepared with assistance from OP&F, are: Paragraphs 74,75,76(a)-(d), 78(f), 79, 80(f) and 82.



SECTION III – PENSION EXPENSE

As noted earlier, the Pension Expense (PE) consists of a number of different items. GASB 68 refers to the first item as Service Cost, which is the Normal Cost using the Entry Age Normal (EAN) actuarial cost method. The second item is interest on the TPL at 8.00%, the SEIR in effect as of the Prior Measurement Date.

The next three items refer to any changes that occurred in the TPL due to:

- benefit changes,
- actual versus expected experience, or
- changes in actuarial assumptions or other inputs.

Benefit changes, which are recognized immediately, will increase PE if there is a benefit improvement for existing OP&F members, or decrease PE if there is a benefit reduction. For the year ended December 31, 2018 there were no benefit changes to be recognized.

The next item to be recognized is the portion of current year changes in TPL due to actual versus expected experience for the year. The portion to recognize in the current year is determined by spreading the total change over the average expected remaining service life of the entire OP&F membership at the beginning of the measurement period. The average expected remaining service life of active members is the average number of years the active members are expected to remain in covered employment. At the beginning of the measurement period, this number is 11.20 years. The average expected remaining service life of the inactive members is zero. Therefore, the recognition period is the weighted average of these two amounts, or 5.16 years.

The last item under changes in TPL is changes in actuarial assumptions or other inputs. There have been no changes in the actuarial assumptions since the Prior Measurement Date. If there was such a change, the change would be recognized over the average expected remaining service life of the entire OP&F membership, using the same approach that applied to experience gains and losses as described earlier.

Employee contributions for the year and projected earnings on the FNP at the long-term expected rate of return are subtracted from the amount determined thus far. One-fifth of current-period differences between projected and actual earnings on the FNP is recognized in the PE.

The current year portions of previously determined experience, assumption changes and earnings amounts, recognized as Deferred Outflows of Resources and Deferred Inflows of Resources are included next. Deferred Outflows of Resources are added to the PE while Deferred Inflows of Resources are subtracted from the PE. Finally, administrative expenses and other miscellaneous items are included.

To the extent OP&F determines there are any employer-specific liabilities and related pension expense, the collective pension expense may need to be reduced to reflect those employer specific amounts before allocating the remainder of the pension expense to all employers.

The calculation of the PE for the year ended December 31, 2018 is shown in the following table.



**Pension Expense
For the Year Ended**

December 31, 2018	
Service Cost at end of year	\$331,600,261
Interest on the Total Pension Liability	1,663,040,537
Benefit term changes	0
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	62,519,636
Expensed portion of current-period assumption changes	0
Employee contributions	(295,472,374)
Projected earnings on plan investments	(1,174,970,094)
Expensed portion of current-period differences between projected and actual earnings on plan investments	326,740,976
Administrative expenses	16,234,396
Other	7,047,680
Recognition of beginning Deferred Outflows of Resources	344,608,371
Recognition of beginning Deferred Inflows of Resources	<u>(190,174,756)</u>
Total Pension Expense	\$1,091,174,633

Note: Average expected remaining service life for all members is 5.16 years.



SECTION IV – NOTES TO FINANCIAL STATEMENTS

The material presented herein will follow the order presented in GASB 68. Paragraph numbers are provided for ease of reference.

Paragraph 74: The information required is to be prepared by OP&F and/or the individual employer.

Paragraph 75: The information required is to be prepared by the individual employer.

Paragraph 76(a): The name of the pension plan is the Ohio Police & Fire Pension Fund (OP&F) and it is a cost-sharing, multiple-employer public employee retirement system. The Fund is administered by the Ohio Police & Fire Pension Fund Board of Trustees.

Paragraph 76(b):

(1) Classes of employees covered: All full-time police officers or firefighters are eligible for membership in OP&F immediately upon commencement of employment as a full-time police officer or firefighter.

(2) Types of benefits: The main benefits provided are retirement benefits. However, OP&F also provides ancillary benefits in the event of pre-retirement death, disability, or termination of employment prior to meeting the eligibility requirements to retire. OP&F also offers a deferred-retirement option plan (DROP).

(3) Key elements of the pension formulas:

Police members: Police members have key elements of their pension formulas that vary based on their membership group. The three groups are members with 15 or more years of service as of July 1, 2013, members with less than 15 years of service as of July 1, 2013, and members hired after July 1, 2013. Retirement eligibility, pensionable compensation and benefit percentages vary based on age, service and group. See Appendix B for more detail.

Fire members: Key elements of the pension formulas for fire members vary based on their group. The three groups are members with 15 or more years of service as of July 1, 2013, less than 15 years of service as of July 1, 2013 and members hired after July 1, 2013. Retirement eligibility, pensionable compensation and benefit percentages vary based on age, service and group. See Appendix B for more detail.

(4) Terms with respect to automatic postemployment benefit changes, including automatic COLAs and ad hoc COLAs: OP&F provides for annual Cost of Living Increases to members. Key elements of these COLAs vary based on groups of members. See Appendix B for more detail.

(5) Authority under which benefit terms are established or may be amended: Benefit terms for the Ohio Police & Fire Pension Fund are established in Chapter 742 of the Ohio Revised Code



(ORC), as amended by Senate Bill No. 340, and can only be amended by the Ohio General Assembly.

Paragraph 76(c):

- (1) **Basis for determining the employer's contributions to the plan:** State statutes set out the funding requirements for OP&F. Member and employer contribution rates are set by Ohio law.
- (2) **Identification of the authority under which contribution requirements of the employer and employees are established or may be amended:** State statutes set out the funding requirements for OP&F. Member contribution rates are set by Ohio law. State law permits the Board of Trustees to adjust the member contribution rate if, in consultation with the actuary following an actuarial review, OP&F determines that an adjustment to the rate is appropriate. Employer contribution rates are also set by Ohio law. A change in the employer rates requires action by both Houses of the General Assembly and approval by the Governor.
- (3) **The contribution rates (in dollars or as a percentage of covered payroll) of those entities for the reporting period:**

Members: 12.25 percent of base pay.

Employers: Employers of police officers pay 19.5 percent of salary; employers of firefighters pay 24 percent of salary. The State of Ohio also makes a contribution to OP&F.

OP&F allocates a portion of the contributions to the Health Care Stabilization Fund (HCSF) and the rest to the pension fund. The allocation to the HCSF for 2018 was 0.5 percent of salary.

These contribution rates, minus the allocation to the HCSF, are used in the projection of the fiduciary net position in Schedule A in the Appendix, which is used for determining the crossover point for the development of the discount rate.

Amount of contributions recognized by the pension plan from the employer during the reporting period (only the total amounts recognized as additions to the plan's fiduciary net position are reflected here): For the fiscal year ending December 31, 2018, OP&F received \$478,294,974 in contributions from employers and \$300,811 in contributions from State of Ohio subsidies.

Paragraph 76(d): Whether the pension plan issues a stand-alone financial report (or the pension plan is included in the report of a public employee retirement system or another government) that is available to the public and, if so, how to obtain the report: The pension plan issues a stand-alone financial report that can be found at:

<https://www.op-f.org/Information/Reports.aspx>



Paragraph 77: This paragraph requires information to be disclosed regarding the actuarial assumptions and other inputs used to measure the TPL. The complete set of actuarial assumptions and other inputs utilized in developing the TPL are outlined in Appendix C. The TPL as of December 31, 2018 was determined based on an actuarial valuation, prepared as of January 1, 2018, rolled forward one year to December 31, 2018, using the following actuarial assumptions and other inputs:

Price Inflation	2.75 percent
Wage Inflation	3.25 percent
Salary increases, including wage inflation	3.75 to 10.50 percent
Long-term Rate of Return, net of investment expense, including price inflation	8.00 percent
Municipal Bond Index Rate	4.13 percent
Year FNP is projected to be depleted	N/A
Single Equivalent Interest Rate, net of investment expense, including price inflation	8.00 percent
Post-retirement benefit increases	Simple COLA of 2.2% per year
Mortality	Mortality for non-disabled participants is based on the RP-2014 Total Employee and Healthy Annuitant Mortality Tables rolled back to 2006, adjusted according to the rates in the following table, and projected with the Buck Modified 2016 Improvement Scale. Rates for surviving beneficiaries are adjusted by 120%.

Age	Police	Fire
67 or less	77%	68%
68-77	105%	87%
78 and up	115%	120%



Mortality for disabled participants is based on the RP-2014 Disabled Mortality Tables rolled back to 2006, adjusted according to the rates in the following table, and projected with the Buck Modified 2016 Improvement Scale.

Age	Police	Fire
59 or less	35%	35%
60-69	60%	45%
70-79	75%	70%
80 and up	100%	90%

The actuarial assumptions used in the valuation are based on the results of a five-year experience review covering the period 2012-2016. The experience study was performed by OP&F's prior actuary and the assumptions were effective January 1, 2017.

Paragraph 78:

(a): Discount rate (SEIR). The discount rate used to measure the TPL at December 31, 2018 was 8.00 percent. There was no change in the discount rate since the Prior Measurement Date.

(b): Projected cash flows. The projection of cash flows used to determine the discount rate assumed that plan contributions from members and employers will be made at the current contribution rate as set out in state statute, each year:

- a. Employee contribution rate: 12.25 percent of base pay.
- b. Employer contribution rate: Employers of police officers pay 19.5 percent of salary; Employers of firefighters pay 24 percent of salary. OP&F allocates a portion of the contributions to the Health Care Stabilization Fund (HCSF) and the rest to the pension fund. The allocation to the HCSF for 2018 was 0.5 percent of salary.
- c. Administrative expenses in the prior year were projected forward with price inflation as an estimate for administrative expenses in current and future years. The portion of expenses in future years allocated to the current members was based on the proportionate share of covered payroll in each year for the remainder of the existing members to the total covered payroll for all members.

Based on those assumptions, OP&F's FNP was projected to be available to make all projected future benefit payments of current OP&F members. Therefore, the long-term expected rate of return on OP&F's investments of 8.00% was applied to all periods of projected benefit payments to determine the TPL.

The FNP projections are based upon OP&F's financial status on the Measurement Date, the indicated set of methods and assumptions, and the requirements of GASB 67 and 68. As such, the FNP projections are not reflective of the cash flows and asset accumulations that would occur on



an ongoing plan basis, reflecting the impact of future members. The FNP does include the member and Fund contributions in excess of future new member’s normal costs for expected future new members as allowed by the Standard. Therefore, the results of this test do not necessarily indicate whether or not the fund will actually run out of money, the financial condition of OP&F, or OP&F’s ability to make benefit payments in future years.

(c): Long-term rate of return: The long-term expected rate of return on pension plan investments is reviewed as part of regular experience studies prepared for OP&F about every five years. The current long-term expected rate of return is based on the results of an experience study effective January 1, 2017. The rate was determined using a building- block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges 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. The assumption is intended to be a long-term assumption (30 to 50 years) and is not expected to change absent a significant change in the asset allocation, a change in the underlying inflation assumption, or a fundamental change in the market that alters expected returns in future years.

(d): Municipal bond rate. A municipal bond rate was not used in determining the discount rate. If it were required, the rate would be 4.13% on the Measurement Date.

(e): Periods of projected benefit payments. Projected future benefit payments for all current plan members were projected through 2117.

(f): Assumed asset allocation. The target asset allocation and best estimates of arithmetic real rates of return for each major asset class as of the Measurement Date, as provided by OP&F’s investment consultant, Wilshire., are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return*
Fixed Income	23.0%	2.20%
International Equities	20.0%	7.88%
Domestic Equities	19.0%	6.37%
Real Estate	10.0%	5.26%
Private Equity	10.0%	8.97%
Other Investments	<u>18.0%</u>	5.26%
Total	100.0%	5.66%

*Geometric mean, net of investment expenses



(g): Sensitivity analysis. This paragraph requires disclosure of the sensitivity of the NPL to changes in the discount rate. The following presents the NPL of OP&F, calculated using the discount rate of 8.00 percent, as well as OP&F’s NPL calculated using a discount rate that is 1-percentage-point lower (7.00 percent) or 1-percentage-point higher (9.00 percent) than the current rate:

	1% Decrease (7.00%)	Current Discount Rate (8.00%)	1% Increase (9.00%)
Total Pension Liability	\$24,670,287,708	\$22,103,699,175	\$19,958,943,830
Fiduciary Net Position	<u>13,941,056,807</u>	<u>13,941,056,807</u>	<u>13,941,056,807</u>
Net Pension Liability	\$10,729,230,901	\$8,162,642,368	\$6,017,887,023

Paragraph 79: The required information will be supplied by OP&F.

Paragraph 80:

(a)-(b): This information will be supplied by OP&F.

(c): The Measurement Date of the collective NPL is December 31, 2018. The TPL at December 31, 2018 is based upon an actuarial valuation prepared as of January 1, 2018, rolled forward one year using standard actuarial techniques. Because the funding valuation attributes the present value of future benefits through the end of the DROP period, an adjustment is made to value the DROP benefits as if the date of entry into DROP is the member’s retirement date, as required by GASB.

(d): There were no changes to the actuarial assumptions or other inputs since the Prior Measurement Date.

(e): There were no changes in the benefit terms since the Prior Measurement Date.

(f): Based on the available information, OP&F believes that there are no changes between the Measurement Date of the NPL (December 31, 2018) and the employer’s reporting date (December 31, 2019) that are expected to have a significant effect on the NPL.

(f): A comprehensive experience study was performed during 2017 and results were presented to the Board of Trustees in August 2017. The five-year experience review covered the period 2012-2016. The experience study was performed by OP&F’s prior actuary and the assumptions were effective January 1, 2017.

(g): Please see Section III of this report for the development of the collective PE. OP&F will provide the individual employer amounts.



(h): Since certain expense items are recognized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce PE they are labeled Deferred Inflows of Resources. If they will increase PE they are labeled Deferred Outflows of Resources. The recognition of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are recognized over the average expected remaining service life of the active and inactive Plan members at the beginning of the measurement period. Investment gains and losses are recognized equally over a five-year period.

The following table provides a summary of the amounts of the collective Deferred Outflows of Resources and collective Deferred Inflows of Resources as of the Measurement Date (December 31, 2018). Per GASB 68, reporting of the differences between projected and actual earnings should be on a net basis, with only one Deferred Outflow or Inflow. This information is provided in the following table:

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/(Inflows) of Resources
Differences between expected and actual experience	\$335,370,476	\$7,622,286	\$327,748,190
Changes of assumptions	216,402,752	0	216,402,752
Differences between projected and actual earnings	<u>1,526,864,844</u>	<u>521,234,126</u>	<u>1,005,630,718</u>
Total	\$2,078,638,072	\$528,856,412	\$1,549,781,660



The following tables show the collective Deferred Outflows of Resources and collective Deferred Inflows of Resources separately to provide additional detail.

Deferred Outflows of Resources								
	December 31, 2017		Additions		Recognition		December 31, 2018	
Differences between expected and actual experience								
FY 2014 Base	\$	0	\$	0	\$	0	\$	0
FY 2015 Base		0		0		0		0
FY 2016 Base		1,440,485		0		351,338		1,089,147
FY 2017 Base		91,699,558		0		17,499,916		74,199,642
FY 2018 Base		<u>0</u>		<u>322,601,323</u>		<u>62,519,636</u>		<u>260,081,687</u>
Total	\$	93,140,043	\$	322,601,323	\$	80,370,890	\$	335,370,476
Changes of assumptions								
FY 2014 Base	\$	0	\$	0	\$	0	\$	0
FY 2015 Base		0		0		0		0
FY 2016 Base		0		0		0		0
FY 2017 Base		267,441,138		0		51,038,386		216,402,752
FY 2018 Base		<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>
Total	\$	267,441,138	\$	0	\$	51,038,386	\$	216,402,752
Differences between projected and actual earnings								
FY 2014 Base	\$	55,817,785	\$	0	\$	55,817,785	\$	0
FY 2015 Base		439,801,888		0		219,900,946		219,900,942
FY 2016 Base		0		0		0		0
FY 2017 Base		0		0		0		0
FY 2018 Base		<u>0</u>		<u>1,633,704,878</u>		<u>326,740,976</u>		<u>1,306,963,902</u>
Total	\$	495,619,673	\$	1,633,704,878	\$	602,459,707	\$	1,526,864,844
Total	\$	856,200,854	\$	1,956,306,201	\$	733,868,983	\$	2,078,638,072



Deferred Inflows of Resources

	December 31, 2017		Additions		Recognition		December 31, 2018
Differences between expected and actual experience							
FY 2014 Base	\$ 0	\$	0	\$	0	\$	0
FY 2015 Base	11,102,784		0		3,480,498		7,622,286
FY 2016 Base	0		0		0		0
FY 2017 Base	0		0		0		0
FY 2018 Base	<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>
Total	\$ 11,102,784	\$	0	\$	3,480,498	\$	7,622,286
Changes of assumptions							
FY 2014 Base	\$ 0	\$	0	\$	0	\$	0
FY 2015 Base	0		0		0		0
FY 2016 Base	0		0		0		0
FY 2017 Base	0		0		0		0
FY 2018 Base	<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>
Total	\$ 0	\$	0	\$	0	\$	0
Differences between projected and actual earnings							
FY 2014 Base	\$ 0	\$	0	\$	0	\$	0
FY 2015 Base	0		0		0		0
FY 2016 Base	116,545,932		0		38,848,645		77,697,287
FY 2017 Base	591,382,452		0		147,845,613		443,536,839
FY 2018 Base	<u>0</u>		<u>0</u>		<u>0</u>		<u>0</u>
Total	\$ 707,928,384	\$	0	\$	186,694,258	\$	521,234,126
Total	\$ 719,031,168	\$	0	\$	190,174,756	\$	528,856,412

OP&F will provide the individual employers' balances of the collective Deferred Inflows of Resources and collective Deferred Outflows of Resources.



(i): Collective amounts reported as Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions will be recognized in PE in future fiscal years as follows:

Fiscal Year Ending December 31:	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows/(Inflows) of Resources
2019	\$678,051,194	\$190,174,756	\$487,876,438
2020	458,150,252	190,174,753	267,975,499
2021	458,150,252	148,506,903	309,643,349
2022	457,834,045	0	457,834,045
2023	26,452,329	0	26,452,329
Thereafter	0	0	0

OP&F will provide the individual employers' balances of the collective Deferred Inflows of Resources and collective Deferred outflows of Resources.

(j): This information will be provided by OP&F.



SECTION V – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in OP&F's financial statements:

Paragraphs 81(a) and (b): This information will be provided by OP&F.

Paragraph 82: Information about factors that significantly affect trends in the amounts reported in the schedules required by paragraph 81 should be presented as notes to the schedules.

There have been no changes in assumptions or plan provisions since the January 1, 2017 actuarial valuation.



APPENDIX A

ADDITIONAL INFORMATION

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY

Fiscal Year Ended December 31

	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
	(a)	(b)	(a) – (b)
Balances at December 31, 2017	\$21,101,065,550	\$14,963,614,004	\$6,137,451,546
Changes for the year:			
Service Cost at end of year	331,600,261		331,600,261
Interest on TPL	1,663,040,537		1,663,040,537
Benefit term changes	0		0
Differences between expected and actual experience	322,601,323		322,601,323
Assumption/SEIR changes	0		0
Employer and State contributions		478,595,785	(478,595,785)
Employee contributions		295,472,374	(295,472,374)
Net investment income		(458,734,784)	458,734,784
Benefit payments, including member refunds	(1,314,608,496)	(1,314,608,496)	0
Administrative expenses		(16,234,396)	16,234,396
Other		(7,047,680)	7,047,680
Net changes	<u>1,002,633,625</u>	<u>(1,022,557,197)</u>	<u>2,025,190,822</u>
Balances at December 31, 2018	\$22,103,699,175	\$13,941,056,807	\$8,162,642,368



APPENDIX B

SUMMARY OF MAIN BENEFIT PROVISIONS

The following is intended to summarize the key provisions valued in this valuation. Members of OP&F and other parties should not rely on this summary as a substitute for or legal interpretation of the laws and rules covering this retirement plan.

Membership

Membership in OP&F is mandatory under Ohio Law for all full-time police officers employed by Ohio municipalities and appointed under the required statutory provisions. Membership is also mandatory for all full-time firefighters employed by Ohio municipalities, townships, villages, joint fire districts or other political subdivisions. In order to become members of OP&F, full-time firefighters are required to satisfactorily complete, or have satisfactorily completed, a firefighter training course approved under former Section 3303.07, Section 4765.55 or conducted under Section 3737.33 of the ORC.

Eligibility for Membership

Full-time police officers or firefighters are eligible for membership in OP&F immediately upon commencement of employment as a full-time police officer or firefighter.

Contributions

Employer and member contributions are established by statute and both are due monthly. Employers of police officers pay 19.5 percent of salary; employers of firefighters pay 24 percent of salary. Members contributed 10 percent of salary through July 1, 2013. On July 2, 2013 the member contribution rate increased by 0.75 percent to 10.75 percent. The member contribution rate increased annually by 0.75 percent until it reached the current 12.25 percent on July 2, 2015.

Employer Contribution Rates – Percentage of Active Member Payroll:

Time Frame of Rates	Police	Fire
Jan 1, 1986 thru Present	19.50%	24.00%



Plan Summary (continued)

Member Contribution Rates – Percentage of Active Member Payroll:

Time Frame of Rates	Police	Fire
July 2, 2015 and Thereafter	12.25%	12.25%
July 2, 2014 thru July 1, 2015	11.50%	11.50%
July 2, 2013 thru July 1, 2014	10.75%	10.75%
Sept. 9, 1988 thru July 1, 2013	10.00%	10.00%

Benefits

Service Retirement

Upon attaining a qualifying age with sufficient years of service, a member of OP&F may retire and receive a lifetime monthly pension. OP&F offers four types of service retirement: normal, service commuted, age/service commuted and actuarially reduced. Each type has different eligibility guidelines and is calculated using the member's average annual salary.

Since average annual salary is subject to certain statutory and administrative limitations, not all salary, earnings, or compensation may be used in the calculation. OP&F calculates allowable average annual salary as follows:

- For OP&F members with 15 or more years of service credit as of July 1, 2013, average annual salary is an average of the three years of highest allowable earnings, regardless of when in their career the highest years occurred.
- For OP&F members with less than 15 years of service credit as of July 1, 2013, average annual salary is an average of the five years of highest allowable earnings, regardless of when in their career the highest years occurred.
- A “salary benchmark” is established for members with 15 or more years of service credit as of July 1, 2013, under which certain increases are excluded from salary for the purpose of determining allowable average annual salary. This benchmarking does not apply to members with less than 15 years of service credit as of July 1, 2013.

Normal Service Retirement

Eligibility

For members hired into an OP&F-covered position after July 1, 2013, minimum retirement age is 52 with at least 25 years of service credit.

For members hired into an OP&F-covered position on or before July 1, 2013, minimum retirement age is 48 with 25 years of service credit.



Plan Summary (continued)

Benefit

An annual pension equal to a percentage of the allowable average annual salary. The percentage equals 2.5 percent for each of the first 20 years of service, 2.0 percent for each of the next five years of service, and 1.5 percent for each year of service in excess of 25 years. The maximum pension of 72 percent of the allowable average annual salary is paid after 33 years of service.

Service Commuted Retirement

Eligibility

For members hired into an OP&F-covered position after July 1, 2013, the minimum retirement age is 52, they must have at least 15 years of service credit and 25 years have elapsed from the date of their full-time hire.

For members hired into an OP&F-covered position on or before July 1, 2013, the minimum retirement age is 48, they must have at least 15 years of service credit and 25 years of service and 25 years have elapsed from the date of their full-time hire.

Benefit

An annual pension equal to 1.5 percent of the allowable average annual salary multiplied by the number of full years of service credit (up to 25 years).

Age/Service Commuted Retirement

Eligibility

Age 62, 15 years of service credit and still working as a full-time police officer or firefighter.

Benefit

An annual pension that uses the same formula as for the Normal Service Retirement benefit.

Actuarially Reduced

Eligibility

For members hired into an OP&F-covered position after July 1, 2013, age 48 with 25 years of service.

Benefit

An annual pension reduced to the actuarial equivalent of the amount payable had the member retired at age 52.



Plan Summary (continued)

Rights Upon Separation From Service

Deferred Pension

If a member meets the years of service credit required for any of the service retirement pensions but leaves service before attaining the minimum retirement age, a pension becomes payable upon attainment of the qualifying age and filing the appropriate paperwork with OP&F.

Refund of Employee Contributions

Upon separation from service, a member can receive the contributions that he or she made to the plan or the employee share of member contributions picked-up on the member's behalf by their employer. Employer contributions are not refundable.

Termination before Retirement with 25 Years of Service Credit

Benefit

Same as the Normal Service Retirement benefit, except benefit commences once the member reaches minimum retirement age.

- For members hired into an OP&F-covered position after July 1, 2013, minimum retirement age is 52.
- For members hired into an OP&F-covered position on or before July 1, 2013, minimum retirement age is 48.

Termination before Retirement with 15 Years of Service Credit

Benefit

Same as the Service Commuted Retirement, except benefit commences once the member reaches minimum retirement age and 25 years have elapsed from the date of full-time hire.

- For members hired into an OP&F-covered position after July 1, 2013, the minimum retirement age is 52.
- For members hired into an OP&F-covered position on or before July 1, 2013, the minimum retirement age is 48.

Termination Before Retirement With Less Than 15 Years of Service Credit

Benefit

A lump sum amount equal to the sum of the member's contributions to OP&F.



Plan Summary (continued)

Deferred Retirement Option Plan

Eligibility

When a member is eligible for a normal service retirement they can enter DROP by delaying retirement and continuing to work as a full-time police officer or firefighter.

- For members hired into an OP&F-covered position after July 1, 2013, normal service retirement eligibility is age 52 with at least 25 years of service credit.
- For members hired into an OP&F-covered position on or before July 1, 2013, normal service retirement eligibility is age 48 with at least 25 years of service credit.

Benefit

DROP is a cost neutral benefit offered by OP&F. Upon the DROP effective date, the member's pension is calculated as if that were their date of retirement. While the member continues to work and draw their normal salary, the amount they would have received in retirement benefits accumulates tax-deferred at OP&F on their behalf, as well as a portion of their OP&F employee contributions and interest. Since the member's pension has already been calculated:

- The years of DROP service do not apply towards the member's normal service retirement.
- If a member earns a higher salary after their DROP effective date due to a raise, job promotion, etc., it will not be used to recalculate their pension and, therefore, will not result in that member receiving a higher pension upon retirement.

The DROP interest rate is set by administrative rule and is subject to change at any time. OP&F credits interest to all DROP balances each month at a rate equal to the 10-year United States (U.S.) Treasury Note Business Day Series, as published by the U.S. Department of the Treasury, with a cap of five percent. This variable interest rate is adjusted quarterly to match the published 10-year U.S. Treasury Note rate for the last trading business day of the preceding quarter and is in effect for the subsequent quarter.

Members whose election to participate in DROP is effective after July 1, 2013 do not qualify for annual cost-of-living allowances (COLA) at any time during DROP. Members whose election to participate in DROP is effective on or before July 1, 2013 will continue to receive a cost-of-living allowance during DROP, but only when they reach 55 years of age and have been participating in DROP for at least one year. Those members whose enrollment date into DROP qualify them for a cost-of-living allowance during DROP will receive three percent of their base pension.



Plan Summary (continued)

Member contributions are credited to their DROP account based on the number of years of DROP service. For those members whose election to participate in DROP is effective after July 1, 2013, OP&F applies contributions to DROP in the following manner:

Years of DROP Service	Percentage of Member Contributions
Years 1-3	50% of member's contributions
Years 4-5	75% of member's contributions
Years 6-8	100% of member's contributions

For this group of members, the minimum participation in DROP, without penalty, is five years and the maximum is eight.

- If a member terminates employment within the first five years of joining DROP, then the member forfeits all of their DROP interest. In addition to losing their accumulated interest, members who choose to terminate employment before completing their required participation period cannot withdraw any of the funds in their DROP account until the minimum participation period has expired. The only exception to this rule is if the member dies during the minimum participation period. The member's surviving spouse, designated beneficiary or estate, as applicable will receive the entire DROP account balance determined at the time of death.
- If a member chooses to continue working after eight years in DROP, the member forfeits all DROP benefits and receives the Normal Service Retirement benefit upon retirement, which will be calculated to include the service credit earned during the DROP participation period.

For those members whose election to participate in DROP was on or before July 1, 2013, member contributions are applied to DROP under the following schedule:

Years of DROP Service	Percentage of Member Contributions
Years 1-2	50% of member's contributions
Year 3	75% of member's contributions
Years 4-8	100% of member's contributions

For this group of members, the minimum participation in DROP, without penalty, is three years and the maximum is eight.

- If a member terminates employment within the first three years of joining DROP, then the member forfeits all of their DROP interest. In addition to losing their accumulated interest, members who choose to terminate employment before completing their required participation period cannot withdraw any of the funds in their DROP account until the minimum participation period has expired. The only exception to this rule is if the member dies during the minimum participation



Plan Summary (continued)

period. The member's surviving spouse, designated beneficiary or estate, as applicable will receive the entire DROP account balance determined at the time of death.

- If a member chooses to continue working after eight years in DROP, the member forfeits all DROP benefits and receives the Normal Service Retirement benefit upon retirement, which will be calculated to include the service credit earned during the DROP participation period.

All DROP members retiring before the eight-year max receive their Normal Service Retirement benefit determined at the time of DROP entry, with the COLA adjustment (if applicable) to date of retirement when eligible. These members will also receive the DROP account balance as a lump sum or monthly annuity.

If a member dies while participating in DROP, the member's surviving spouse, designated beneficiary or estate will receive the entire DROP account balance determined at the time of death. The surviving spouse or contingent dependent beneficiary will receive the greater of the retirement allowance made at the time of DROP entry or the Normal Service Retirement benefit paid with COLA adjustments (if applicable) to the date of death, paid as if the member had elected a 50 percent joint and survivor option at death. All other statutory death benefits will apply.

If the member becomes disabled while in DROP, and has not terminated employment, the member must choose either to receive a disability benefit or a service retirement with DROP. If the member chooses the disability benefit, the member forfeits all DROP benefits and receives the disability benefit, with service credit during the DROP period included.

Disability Benefits

Members who become unable to perform their official duties and whose earning capacities are impaired may qualify for disability benefits. Disability benefits are classified as either service-incurred (on-duty) or non-service- incurred (off-duty) and differ in eligibility requirements and benefit formulas. Annual medical evaluations are required for disability benefit recipients who would not have met the age and service requirements for a Normal Service Retirement, unless the Board of Trustee waives this requirement based upon an OP&F physician's certification that the disability is ongoing and further evaluation would not be cost effective. Annual earnings statements are also required to be submitted to OP&F.



Plan Summary (continued)

Permanent and Total Disability (On-Duty)

Eligibility

No age or service requirement.

Benefit

An annual benefit equal to 72 percent of the allowable average annual salary.

Partial Disability (On-Duty)

Eligibility

No age or service requirement.

Benefit

If the member has less than 25 years of service credit an annual benefit fixed by the Board of Trustees to be a certain percent up to 60 percent of the allowable average annual salary. If the member has 25 or more years of service credit, the annual disability benefit is equal to the Normal Service Retirement amount.

Non-Service Incurred Disability (off-Duty)

Eligibility

Any age and five years of service credit.

Benefit

An annual amount is the percent awarded by the Board of Trustees and may not exceed 60 percent of the allowable average annual salary. Service over 25 years cannot be used in calculating an off-duty disability award.

Pre-Retirement Survivor Annuity

Eligibility

Upon death before retirement, but after having satisfied the requirements for a Normal Service Retirement or an Age/Service Commuted retirement.

Benefit

The surviving spouse or contingent dependent beneficiary will receive the equivalent of a 50 percent joint and survivor annuity, calculated under the assumption that the decedent had retired effective the day following his/her death.



Plan Summary (continued)

Statutory Survivor Benefits

Eligibility

Upon death of any active or retired member of OP&F.

Benefit

- **Surviving Spouse's Benefit**

An annual amount equal to \$6,600 (\$550 monthly), plus an annual COLA of three percent of the original base benefit, paid each July 1, beginning July 1, 2000. The benefit is paid to the surviving spouse for life.

If the spouse is receiving a full death benefit under the Death Fund Benefit statute, the spouse's statutory survivor benefit is \$4,920 (\$410 monthly). The Death Benefit Fund is funded by the State of Ohio and provides special benefits to eligible survivors of public safety officers who are killed in the line of duty or who die from injuries or disease incurred in the performance of official duties. These eligible survivors are entitled to receive the member's full monthly salary, which will be reduced at the member's retirement eligibility date. These death benefit payments are in addition to any optional payment plan benefits elected by the member.

- **Surviving Child's Benefit**

An annual amount equal to \$1,800 (\$150 monthly), payable until such child attains age 18 or marries, whichever occurs first. The payment can continue to an unmarried full-time student until age 22. A dependent disabled child, regardless of age at time of member's death, is entitled to a benefit until death or recovery from disability. A COLA of three percent of the original base is payable each July 1.

- **Dependent Parents' Benefit**

If there is no surviving spouse or dependent children, an annual amount of \$2,400 (\$200 monthly) is payable to one dependent parent or \$1,200 (\$100 monthly) each to two dependent parents for life or until dependency ceases or remarriage. A COLA of three percent of the original base is payable each July 1.



Plan Summary (continued)

Survivors	Monthly Pension	Causes of Termination
Widow/Widower	current amount + future COLA	*Death
Minor child	current amount + future COLA	*Death *Marriage *Attainment of age 18
Dependent disabled child	current amount + future COLA	*Death *Recovery from disability
Student	current amount + future COLA	*Death *Marriage *Attainment of age 22 *Loss of student status
One dependent parent	current amount + future COLA	*Death *Re-marriage
Two dependent parents	1/2 current amount (each) + future COLA	*Termination of dependency

Benefit Type	Base Monthly Benefit Amount	Base Monthly Benefit	
		Amount Plus Increases Through July 1, 2017	Monthly Increases Effective July 1, 2018
Spouse *	\$550	\$842.60 **	\$16.50
Child	150	229.80 ***	4.50
One Parent	200	306.40 ****	6.00
Two Parents	100	153.20	3.00

- * Spouse's benefit is \$410 if spouse is receiving a full death benefit under the Death Fund Benefit statute. There is no annual increase on this benefit payment.
- ** On July 1, 2000 the Statutory Surviving Spouse Benefit increased by \$12.10 per month. This increase was a percentage of the original benefit amount, equaling the percentage increase in the CPI plus unused prior increases, to a maximum of three percent. Every year after 2000, the monthly increase was \$16.50 or three percent of the base benefit.
- *** On July 1, 2000 the Statutory Child Benefit increased by \$3.30 per month. This increase was a percentage of the original benefit amount, equaling the percentage increase in the CPI plus unused prior increases, to a maximum of three percent. Every year after 2000, the monthly increase was \$4.50 or three percent of base benefit.
- **** On July 1, 2000 the Statutory Surviving One Parent Benefit increased by \$4.40 per month. This increase was a percentage of the original benefit amount, equaling the percentage increase in the CPI plus unused prior increases, to a maximum of three percent. Every year after 2000, the monthly increase was \$6.00 or three percent of base benefit.



Plan Summary (continued)

Lump Sum Death Benefit

Eligibility

Upon death of any retired or disabled member of OP&F.

Benefit

A lump sum payment of \$1,000 is paid to the member's surviving spouse or, if no surviving spouse, to a designated beneficiary. If there is no surviving spouse or beneficiary, then it is paid to the member's estate.

Annuities

Effective Feb. 28, 1980, for those members who are retiring on either a service pension or a disability benefit, optional annuity plans can be chosen, subject to certain limitations. The member can elect actuarially reduced benefits under a joint and survivor annuity, life annuity certain and continuous, or multiple beneficiary annuity plan. The optional annuity plans allow the member's beneficiary(ies) to receive a lifetime payment upon the member's death.

Annuity Types

Single Life Annuity

For unmarried members, this is the standard annuity plan. Married members may elect this plan only if the spouse consents to the selection in writing. This plan pays the maximum retirement allowance that the member is entitled to receive and, upon the member's death, none of the pension or benefit is continued to any beneficiary.

Joint and Survivor Annuity (JSA)

Under this plan, a member designates that, upon his or her death, a certain percentage of the member's actuarially reduced benefit is continued to a surviving designated beneficiary for life.

Any percentage between one percent and 100 percent of the member's reduced pension may be continued to the surviving designated beneficiary, but the percent continued may be limited based on the beneficiary's age. If a member is married at the time benefits are elected, the standard plan is a 50 percent JSA continuing one-half of the member's reduced monthly benefit to his or her surviving spouse. If the member wants to select a plan which provides for the continuation of benefits for someone other than the spouse or less than 50 percent JSA to the spouse, the spouse must consent in writing to this choice. This plan automatically terminates upon death of the beneficiary, to be effective the month following OP&F's receipt of notice of death, or it may be cancelled upon divorce with the consent of the member's spouse or a specific court order, at which point the annuity reverts to the



Plan Summary (continued)

single life annuity to the member. Elected option may be cancelled within one year after benefits commence, with the consent of the beneficiary.

Multiple Beneficiary Annuity

Under the multiple beneficiary annuity plan, a member may designate up to four beneficiaries at the time of retirement so that, upon death, a certain percentage of the member's actuarially reduced benefit is continued to the surviving beneficiaries for their lives. If the member is married at the time of retirement, the spouse must consent in writing for an annuity selection that provides for less than 50 percent JSA payable to the spouse.

Life Annuity Certain and Continuous (LACC)

This plan provides a lifetime allowance to the member and will only be paid to a designated beneficiary if the member dies and the period elected by the member has not expired. The minimum guarantee period is five years and the maximum is 20 years. 100 percent of the member's reduced pension continues to the beneficiary for the guarantee period selected. Elected option may be cancelled within one-year after benefits commence, with the consent of the beneficiary. If the member is married at the time of retirement, the spouse must consent in writing for an annuity selection that provides for less than a 50 percent JSA payable to the spouse.

Tiered Retirement Plan – COLA or Terminal Pay (Non-COLA)

Members retiring on or after July 24, 1986, who had 15 or more years of service credit as of January 1, 1989, are eligible to select between two different pension calculation plans. Under the terminal pay method, a member's monthly pension benefit is calculated using terminal payouts at the time of retirement such as accrued sick leave and vacation compensation to increase the amount of the average annual salary, but subject to certain limitations, and these members are not eligible to receive cost-of-living allowance adjustments. Under the COLA method, terminal payments are not included in the calculation of a member's average annual salary, but the member is eligible to receive COLA increases. The COLA method is the automatic calculation method for any active member with fewer than 15 years of service as of January 1, 1989



Under the COLA method, members who are at least 55 years old and have been receiving OP&F pension benefits for at least one year are eligible for cost-of-living allowance adjustments. The age 55 provision for receiving a COLA does not apply to those who are receiving a permanent and total disability benefit, surviving beneficiaries under optional plans and statutory survivors.

The COLA amount for members who have 15 or more years of service credit as of July 1, 2013 and members who are receiving a pension benefit that became effective before July 1, 2013 will be equal to three percent of the member's base pension benefit.

The COLA amount for members who have less than 15 years of service credit as of July 1, 2013, and members whose pension benefit became effective on or after July 1, 2013, will be equal to a percentage of the member's base pension benefit where the percentage is the lesser of three percent or the percentage increase in the consumer price index, if any, over the twelve-month period that ends on the thirtieth day of September of the immediately preceding year, rounded to the nearest one-tenth of one percent.

Members who retired prior to July 24, 1986 or their surviving beneficiaries under optional plans are entitled to cost-of-living allowance increases. The annual increase is paid on July 1st of each year. The annual COLA increase is \$360 under a Single Life Annuity Plan with proportional reductions for optional payment plans.

Re-employed Retiree's Defined Contribution Plan Benefit

Effective June 30, 1991, every person who is retired under an Ohio public pension plan and who is re-employed in an OP&F covered position must contribute to OP&F at the same rate as other police officers or firefighters. The employer pays the normal rate as well. If the re-employed member terminates employment before age 60, Ohio law allows the member to receive a lump sum payment of post-retirement employee contributions made during the period of re-employment, plus interest. If the member waits until age 60 to receive this benefit, he or she can choose to receive either a lump sum payment in an amount equal to twice his or her contributions, plus interest, or a lifetime annuity paid monthly. If, after calculation, the member's lifetime monthly annuity is less than

\$25, the member may only select the lump sum payment option. If the member is married spousal consent is required before payment can occur.

Group Health Insurance and Medicare

Commencing January 1, 1974, the Board of Trustees may contract for group health insurance on the basis of part or all of the cost of the premium for the coverage to be paid by OP&F. Medical and prescription drug coverage sponsored by OP&F are not vested rights and are subject to change at any time upon action of the Board of Trustees.



Effective January 1, 1977, OP&F is mandated to pay the premium for supplemental Medicare (Part B) up to the statutory maximum provided the benefit recipient is not eligible for reimbursement from any other sources. By law, OP&F is required to pay monthly to each recipient of service benefits, disability benefits and survivor benefits not less than \$96.40, with the exception that OP&F cannot pay an amount that exceeds the amount paid by the recipient for the coverage. Once OP&F obtains the proper documentation from the service retiree, disability retiree or surviving beneficiary of their enrollment in the Medicare program, Medicare (Part B) premium payments begin.

Note: This benefit is not included in the principal valuation results, but is included in the retiree health care valuation results.

Effective July 1992, retirees and survivors make monthly medical benefit contributions, which are credited to the Health Care Stabilization Fund. These contributions are reviewed on an annual basis to determine adequacy with the rising cost of health care. In 2004, a new contribution strategy was implemented. Retirees and survivors now pay a percentage of the full cost of the benefit. The percentage ranges from 25 percent to 100 percent for themselves and dependents based on the year of retirement.



APPENDIX C

STATEMENT OF ACTUARIAL ASSUMPTIONS AND OTHER INPUTS

The actuarial assumptions were adopted as of January 1, 2017, based on a five-year experience review covering the period 2012 through 2016. The next review of the actuarial assumptions is to be completed for adoption with the January 1, 2022 valuation.

Interest Rate

8.00 percent per annum, compounded annually.

Salary Increase Rates

Assumed annual salary increases are as follows:

Years of Service	Salary Increase Rate
Less than 1	10.50%
1	9.00%
2	8.00%
3	6.00%
4	4.50%
5 or more	3.75%

Payroll Growth

3.25 percent per annum, compounded annually, consisting of inflation rate of 2.75 percent plus productivity increase rate of 0.5 percent.

DROP Interest Crediting Rate

4.0 percent per annum, compounded annually.

CPI-Based COLA

2.2 percent simple for increases based on the lesser of the increase in CPI and three percent.

Withdrawal Rates

The following sample withdrawal rates are based on age and service (for causes other than death, disability, or retirement):



Description of Actuarial Assumptions and Methods (continued)

Police

Years of Service	Age							
	25	30	35	40	45	50	55	60
0	9.62%	9.94%	15.93%	17.85%	15.22%	22.00%	18.68%	19.23%
1	5.88%	5.54%	6.49%	7.65%	5.99%	10.15%	11.21%	11.54%
2	3.27%	4.21%	3.92%	5.87%	5.80%	9.90%	9.34%	9.62%
3	4.11%	3.35%	4.66%	5.74%	5.61%	9.17%	8.78%	9.04%
4	3.64%	3.06%	4.29%	5.23%	4.95%	7.95%	7.47%	7.69%
5	2.59%	2.65%	3.49%	4.22%	4.22%	7.57%	8.79%	6.50%
6	2.64%	2.56%	3.28%	3.57%	3.44%	5.86%	7.03%	5.20%
7	2.58%	2.21%	3.18%	3.46%	3.44%	5.71%	6.90%	5.10%
8	2.39%	1.95%	2.56%	1.95%	2.06%	5.57%	6.63%	4.90%
9	2.12%	1.59%	1.74%	1.62%	1.18%	4.43%	6.09%	4.50%
10	1.56%	1.56%	1.66%	1.59%	1.09%	4.31%	6.03%	4.46%
11	1.49%	1.49%	1.58%	1.56%	1.00%	4.20%	5.98%	4.42%
12	1.41%	1.41%	1.50%	1.52%	0.91%	4.09%	5.92%	4.38%
13	1.31%	1.31%	1.42%	1.49%	0.83%	3.97%	5.87%	4.34%
14	1.21%	1.21%	1.33%	1.46%	0.74%	3.86%	5.82%	4.30%
15+	1.17%	1.17%	1.17%	0.91%	0.79%	0.91%	1.10%	1.96%

Firefighters

Years of Service	Age							
	25	30	35	40	45	50	55	60
0	2.69%	3.46%	3.66%	6.22%	8.48%	6.93%	8.73%	19.11%
1	2.11%	1.46%	2.96%	4.98%	7.01%	5.00%	7.16%	15.66%
2	1.53%	1.64%	1.83%	3.04%	4.98%	4.54%	7.16%	15.66%
3	1.44%	1.55%	1.74%	2.90%	4.80%	4.32%	7.16%	15.66%
4	1.15%	1.46%	1.66%	2.77%	4.61%	3.97%	5.73%	12.53%
5	0.83%	0.94%	1.33%	1.64%	2.05%	2.91%	5.33%	11.94%
6	0.78%	0.87%	1.24%	1.53%	1.72%	2.58%	3.66%	8.19%
7	0.78%	0.80%	1.19%	1.42%	1.51%	2.37%	3.35%	7.51%
8	0.72%	0.73%	1.05%	1.31%	1.40%	2.26%	3.05%	6.82%
9	0.73%	0.73%	0.86%	1.10%	1.18%	1.62%	2.29%	5.12%
10	0.73%	0.73%	0.84%	1.07%	1.16%	1.55%	2.21%	4.95%
11	0.71%	1.71%	0.82%	1.05%	1.14%	1.49%	2.13%	4.78%
12	0.68%	0.68%	0.80%	1.03%	1.12%	1.42%	2.06%	4.60%
13	0.65%	0.65%	0.78%	1.01%	1.10%	1.36%	1.98%	4.43%
14	0.61%	0.61%	0.76%	0.99%	1.07%	1.29%	1.91%	4.26%
15+	0.90%	0.90%	0.90%	0.47%	0.50%	0.59%	0.92%	1.21%



Description of Actuarial Assumptions and Methods (continued)

Rates of Disability

The following are sample rates of disability and occurrence of disability by type:

Age	Police		Fire	
	Hired Before July 2, 2013	Hired After July 1, 2013	Hired Before July 2, 2013	Hired After July 1, 2013
20	0.001%	0.001%	0.001%	0.001%
25	0.007%	0.007%	0.005%	0.005%
30	0.089%	0.089%	0.002%	0.022%
35	0.154%	0.154%	0.091%	0.091%
40	0.403%	0.403%	0.204%	0.204%
45	0.533%	0.533%	0.347%	0.347%
50	1.351%	0.691%	1.337%	0.475%
55	1.119%	1.119%	2.025%	2.025%
60	2.078%	2.078%	3.060%	3.060%
64	3.099%	3.099%	7.190%	7.190%

Upon attainment of normal retirement eligibility, the rate is 0.300%.

Type of Disability	
On duty permanent and total	17%
On duty partial	58%
Off duty ordinary	25%



Description of Actuarial Assumptions and Methods (continued)

Retirement Rates

The following rates of retirement apply to members who have not elected to be in DROP:

Age	Police	Firefighter
48	0%	0%
48-50	5%	4%
51	6%	4%
52	6%	6%
53	10%	6%
54	10%	7%
55-57	11%	11%
58	5%	16%
59	10%	16%
60	18%	20%
61	19%	20%
62	25%	50%
63	25%	20%
64	25%	25%
65-69	35%	25%
70	100%	100%

Deferred Retirement Option Plan Elections

90 percent of members who do not retire when first eligible are assumed to elect DROP.



Description of Actuarial Assumptions and Methods (continued)

DROP Retirement Rates

The following rates of retirement apply to members in DROP on or before July 1, 2013:

Police

Age	Years in DROP								
	0	1	2	3	4	5	6	7	8
48	5%	5%	0%	0%	0%	0%	0%	0%	0%
49	4%	5%	0%	0%	0%	0%	0%	0%	0%
50	4%	5%	4%	0%	0%	0%	0%	0%	0%
51	4%	5%	4%	10%	0%	0%	0%	0%	0%
52	3%	5%	4%	9%	9%	0%	0%	0%	0%
53	3%	5%	4%	9%	8%	12%	0%	0%	0%
54	4%	5%	5%	10%	9%	13%	13%	0%	0%
55	5%	5%	5%	16%	16%	14%	18%	44%	0%
56	5%	5%	5%	15%	15%	13%	17%	41%	100%
57	5%	5%	5%	16%	15%	14%	17%	43%	100%
58	5%	5%	5%	16%	15%	14%	17%	42%	100%
59	15%	5%	5%	15%	16%	16%	18%	44%	100%
60	17%	5%	5%	16%	17%	18%	19%	47%	100%
61	17%	5%	5%	17%	18%	18%	20%	48%	100%
62	16%	5%	5%	16%	17%	17%	19%	46%	100%
63	18%	6%	6%	18%	19%	19%	21%	50%	100%
64	19%	5%	5%	17%	17%	18%	19%	49%	100%
65	24%	6%	6%	23%	22%	22%	25%	59%	100%
66	24%	6%	6%	20%	19%	22%	22%	54%	100%
67	24%	5%	5%	20%	19%	22%	22%	53%	100%
68	24%	5%	5%	15%	19%	22%	22%	53%	100%
69	24%	5%	5%	20%	19%	22%	22%	47%	100%
70	100%	100%	100%	100%	100%	100%	100%	100%	100%

Firefighter



Description of Actuarial Assumptions and Methods (continued)

Age	Years in DROP								
	0	1	2	3	4	5	6	7	8
48	2%								
49	4%	3%							
50	5%	4%	4%						
51	3%	3%	3%	9%					
52	3%	3%	3%	8%	9%				
53	4%	3%	4%	10%	11%	13%			
54	4%	3%	3%	9%	11%	13%	13%		
55	6%	4%	4%	13%	13%	15%	17%	38%	
56	5%	3%	4%	13%	12%	14%	17%	37%	100%
57	5%	3%	4%	13%	12%	14%	17%	37%	100%
58	5%	3%	4%	17%	15%	15%	17%	46%	100%
59	6%	3%	4%	17%	15%	16%	18%	46%	100%
60	6%	3%	4%	18%	16%	16%	19%	48%	100%
61	6%	3%	4%	17%	15%	15%	19%	45%	100%
62	6%	3%	4%	17%	15%	16%	18%	46%	100%
63	29%	3%	4%	20%	18%	20%	18%	52%	100%
64	32%	3%	4%	21%	20%	22%	19%	55%	100%
65	33%	4%	4%	22%	21%	23%	20%	57%	100%
66	38%	4%	5%	26%	24%	23%	24%	64%	100%
67	38%	4%	5%	26%	24%	23%	24%	65%	100%
68	38%	4%	5%	26%	24%	23%	24%	65%	100%
69	38%	4%	5%	20%	25%	23%	24%	65%	100%
70	100%	100%	100%	100%	100%	100%	100%	100%	100%

The same rates apply for members entering DROP after July 1, 2013, except the rates for years three and four are replaced with the rates for year two.



Description of Actuarial Assumptions and Methods (continued)

The following rates of retirement apply to members who are not yet in DROP but may become eligible in the future:

Police

Age	Years Eligible for DROP									
	0	1	2	3	4	5	6	7	8	9+
47	6%									
48	12%									
49	7%	5%								
50	6%	5%	5%							
51	6%	5%	5%	5%						
52	6%	5%	5%	5%	5%					
53	11%	5%	5%	5%	5%	12%				
54	10%	5%	5%	5%	5%	13%	13%			
55	12%	6%	6%	6%	6%	14%	18%	43%		
56	12%	6%	5%	5%	5%	13%	17%	41%	96%	
57	13%	6%	5%	5%	5%	14%	17%	43%	94%	100%
58	7%	5%	5%	5%	5%	13%	17%	43%	98%	100%
59	10%	5%	5%	5%	5%	17%	18%	45%	97%	100%
60	20%	8%	6%	6%	6%	18%	20%	48%	98%	100%
61	32%	6%	5%	5%	5%	18%	19%	46%	93%	100%
62	29%	9%	5%	5%	5%	16%	17%	42%	92%	100%
63	33%	5%	7%	7%	7%	18%	19%	46%	95%	100%
64	31%	11%	7%	7%	7%	18%	19%	49%	93%	100%
65	47%	13%	6%	6%	6%	20%	22%	54%	100%	100%
66	47%	13%	5%	5%	5%	20%	20%	50%	100%	100%
67	47%	13%	18%	18%	18%	20%	20%	46%	100%	100%
68	47%	13%	18%	18%	18%	20%	20%	46%	100%	100%
69	47%	13%	18%	18%	18%	20%	20%	46%	100%	100%
70	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%



Description of Actuarial Assumptions and Methods (continued)

Firefighters

Age	Years Eligible for DROP									
	0	1	2	3	4	5	6	7	8	9+
47	3%									
48	6%									
49	6%	4%								
50	6%	4%	4%							
51	5%	3%	4%	4%						
52	5%	3%	3%	3%	3%					
53	5%	4%	4%	4%	4%	13%				
54	5%	3%	4%	4%	4%	13%	13%			
55	8%	5%	5%	5%	5%	15%	18%	38%		
56	8%	5%	4%	4%	4%	14%	17%	38%	95%	
57	8%	4%	5%	5%	5%	15%	17%	38%	98%	100%
58	8%	5%	4%	4%	4%	16%	19%	46%	97%	100%
59	9%	5%	5%	5%	5%	16%	19%	46%	97%	100%
60	10%	5%	7%	7%	7%	17%	20%	49%	86%	100%
61	11%	5%	4%	4%	4%	16%	19%	45%	93%	100%
62	15%	7%	12%	12%	12%	16%	20%	49%	95%	100%
63	33%	7%	4%	4%	4%	19%	16%	48%	100%	100%
64	37%	7%	3%	3%	3%	20%	18%	49%	100%	100%
65	37%	7%	8%	8%	8%	20%	18%	51%	100%	100%
66	37%	7%	4%	4%	4%	23%	23%	61%	100%	100%
67	37%	7%	4%	4%	4%	23%	23%	53%	100%	100%
68	37%	7%	4%	4%	4%	23%	23%	53%	100%	100%
69	37%	7%	4%	4%	4%	23%	23%	47%	100%	100%
70	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Retirement Age for Inactive Vested Participants

Commencement at age 48 and 25 years of service from full-time hire date, whichever is later.



Description of Actuarial Assumptions and Methods (continued)

Healthy Mortality

Mortality for non-disabled participants is based on the RP-2014 Total Employee and Healthy Annuitant Mortality Tables rolled back to 2006, adjusted according to the rates in the following table, and projected with the Buck Modified 2016 Improvement Scale. Rates for surviving beneficiaries are adjusted by 120%.

Age	Police	Fire
67 or less	77%	68%
68-77	105%	87%
78 and up	115%	120%

Disabled Mortality

Mortality for disabled participants is based on the RP-2014 Disabled Mortality Tables rolled back to 2006, adjusted according to the rates in the following table, and projected with the Buck Modified 2016 Improvement Scale.

Age	Police	Fire
59 or less	35%	35%
60-69	60%	45%
70-79	75%	70%
80 and up	100%	90%

Credited Service

Credited service on the valuation date, as provided by OP&F, includes all service credited under the plan, including service transferred from other municipal plans and purchased service. The valuation assumes future service will be credited at the rate of one year per year worked, with no assumed future crediting of transferred service or purchased service.

415 Limits

Benefits are limited by the IRC Section 415, assumed to increase 2.75 percent per annum.



Future Expenses

The normal cost is increased by all administrative expenses budgeted, net of the State Subsidy received from the State of Ohio.

Unknown Data for Members

Same as those exhibited by members with similar known characteristics. Deferred benefits are estimated at termination until OP&F has determined the actual amount at retirement. Reported salaries that are less than \$10,000 when annualized are assumed to be anomalous and are reset to \$60,000. The adjustment for late reported salaries is not applied in this case.

Late Reported Salaries

1.258 percent load to 2017 reported salaries to account for salaries accrued but not reported for the valuation. This adjustment is based on plan experience for the prior year. This adjustment will be reviewed annually for future late reported salaries.

Percent Married

75 percent of active members are assumed to be married.

Age of Spouse

Wives are assumed to be three years younger than their husbands.

Optional Form Election

33 percent of service retirees and 10 percent of disability retirees are assumed to elect the 40 percent Joint and Survivor pension at retirement. If the joint annuitant predeceases the retiree, the increase, or pop-up, in the retiree's benefit associated with the 40 percent Joint and Survivor pension is assumed to be 14.36 percent for disability retirees and 10.50 percent for all other retirees.

DROP Account Distributions

For members who terminate DROP before the required three or five years, distribution of the account balance is assumed to be made in a lump sum payment at the end of the three or five year period. Distributions for other members are assumed to be made in a lump sum or installments at retirements in a pattern equivalent to 25 percent receiving lump sums, 30 percent receiving installments over two years, and 45 percent receiving installments over 10 years.



Dependent Parents

None anticipated, but dependency of any dependent parent in receipt of benefits is assumed to continue for the parent's lifetime.

Dependent Children

Each member is assumed to have two children, born when the member was age 26. Dependency is assumed to cease when the child is 22.

Medicare Part B Premium Reimbursement

For service and disability retirements, as well as survivors, Ohio Police & Fire reimburses the standard Medicare Part B premium (\$107.00 per month for 2018) provided the retiree is not eligible for reimbursement from any other sources.

90 percent of members are assumed to be eligible for reimbursement once they reach age 65.

The Medicare Part B Premium assumptions are only used to determine the cost if the Medicare Part B reimbursement payments were to be paid from the pension trust instead of the Health Care Stabilization Fund.

Methods

Actuarial Cost Method

Projected benefit method with individual level percentage entry age normal cost and actuarial accrued liability. Gains and losses are reflected in the actuarial accrued liability. Prior to January 1, 2015, to be consistent with the asset methodology employed by OP&F, DROP balances were netted out of the liabilities.

Adjustment for Re-Employed Retirees

The present value of future benefits and the actuarial accrued liability are increased by an amount for the re-employed retirees' defined contribution plan benefit equal to two times the re-employed retirees' post-retirement contribution balances on the valuation date.

Adjustment for Employer Accrued Liability

The actuarial accrued liability is reduced by the present value of special employer contributions -- referred to as "Local Funds." Local governments are required by state statute to pay the



unfunded portion of the actuarially- determined liability of the local police and firefighter's relief and pension funds that were merged to form OP&F in 1967. The ORC designates this obligation of the local governments to the Employers' Accrued Liability. Interest on the outstanding balance is being accrued at the rate of 4.25 percent, compounded semiannually. Local governments began repayment in 1969 and payments are required to be made until 2035. The present value of the remaining payments on the valuation date is determined using the valuation interest rate.

Asset Valuation Method

A four-year moving average market value of assets that spreads the difference between the actual investment income and the expected income on the market value (based on the valuation interest rate) over a period of four years. The actuarial value shall not be less than 80 percent or more than 120 percent of market value.

Data

Census and Assets

The valuation was based on members of OP&F as of the valuation date and does not take into account future members. All census and asset data was supplied by OP&F. Salaries and benefits tabulated in the tables in this report were summed to pennies, but displayed to whole dollars, thus, totals may not be consistent with amounts displayed due to rounding.