



2019  
COMPREHENSIVE  
ANNUAL FINANCIAL  
REPORT

FOR YEAR ENDED DECEMBER 31, 2019



## **2019 Comprehensive Annual Financial Report**

For year ended Dec. 31, 2019

*Prepared through the combined efforts of OP&F staff*

### **Prudence • Integrity • Empathy**

*Securing the future for Ohio's police and firefighters*

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# 2019

## COMPREHENSIVE ANNUAL FINANCIAL REPORT

FOR YEAR ENDED DEC. 31, 2019

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*PREPARED THROUGH THE COMBINED EFFORTS OF OHIO POLICE & FIRE PENSION FUND STAFF*

# TABLE OF CONTENTS

v

## INTRODUCTION *unaudited*

- vi Board of Trustees
- vii Administrative Staff
- vii Professional Consultants
- viii Awards
- x Letter of Transmittal
- xv Demographics and Economic Impact

01

## FINANCIAL

- 02 Independent Auditor's Report
- 04 Management's Discussion and Analysis *unaudited*

### BASIC FINANCIAL STATEMENTS

- 08 Statement of Fiduciary Net Position
- 09 Statement of Changes in Fiduciary Net Position
- 10 Notes to Basic Financial Statements

### REQUIRED SUPPLEMENTARY INFORMATION *unaudited*

- 53 Schedule of Changes in the Employers' Net Pension Liability
- 54 Schedule of Employers' Net Pension Liability (Asset)
- 54 Schedule of Employer Contributions – Pension Trust Fund
- 54 Schedule of Investment Returns
- 55 Notes to Required Supplementary Pension Information
- 56 Schedule of Changes in Net OPEB Liability and Related Ratios
- 56 Schedule of Net OPEB Liability (Asset)
- 57 Schedule of Employer Contributions - Retiree Health Care Trust Fund
- 57 Schedule of Investment Returns
- 58 Notes to Required Supplementary OPEB Information
- 59 Schedule of OP&F's Proportionate Share of the Net Pension Liability Ohio Public Employees Retirement Plan
- 60 Schedule of Contributions Ohio Public Employees Retirement Plan
- 61 Schedule of OP&F's Proportionate Share of the OPEB Liability Ohio Public Employees Retirement Plan
- 61 Schedule of OPEB Contributions Ohio Public Employees Retirement Plan

### ADDITIONAL INFORMATION

- 62 Schedule of Administrative Expenses
- 62 Schedule of Investment Expenses
- 63 Combining Statement of Changes in Assets and Liabilities – Public Safety Officers Death Benefit Fund

## 65

---

### INVESTMENTS *unaudited*

- 66** Investment Report
- 74** Investment Portfolio Summary
- 75** Ten Largest Common Stocks
- 75** Ten Largest Bonds and Obligations
- 75** Ten Largest Real Estate Holdings
- 76** Schedule of Investment Results
- 77** Investment Consultants and Money Managers
- 78** Schedule of Brokers' Fees Paid
- 79** Investment Policy and Guidelines

## 89

---

### ACTUARIAL *unaudited*

- 90** Report of Actuary
- 93** Description of Actuarial Assumptions and Methods
- 101** Plan Summary
- 109** Analysis of Financial Experience
  - Pension Trust Fund
- 110** Short-Term Solvency Test
  - Pension Trust Fund
- 111** Active Member Valuation Data
  - Pension Trust Fund
- 111** Retirees and Beneficiaries Added to and Removed from Rolls – Pension Trust Fund
- 112** Calculation of Actuarial Value Assets
  - Pension Trust Fund
- 112** Schedule of Funding Progress
  - Pension Trust Fund
- 113** Employer Contribution Rates
- 113** Member Contribution Rates

# TABLE OF CONTENTS

(continued)

115

## STATISTICAL *unaudited*

**116** Statistical Objectives

### **FINANCIAL TRENDS**

**117** Changes in Fiduciary Net Position  
– Combined Trust Fund

**118** Changes in Fiduciary Net Position  
– Pension Trust Fund

**119** Changes in Fiduciary Net Position  
– Retiree Health Care Trust Fund

**120** Revenues by Source

**120** Expenses by Type

**120** Benefit Expenses by Type

**121** DROP Program Balances

### **REVENUE CAPACITY INFORMATION**

**122** Active Member and Total Payroll Base Statistics

**122** Active Membership Data

**123** Retired Membership by Type of Benefits

**123** Retirees and Beneficiaries Statistics

**124** Average Monthly Benefit Payments

**125** Member Health Care Premium Contributions

**125** State of Ohio Subsidy Payments

**126** OP&F's Cost-of-Living Allowance (COLA) History

**128** Employer Contribution Rates

**128** Member Contribution Rates

**128** Health Care Allocation Rates from  
Employer Contributions

**129** Actuarial Interest Rates

**130** DROP and Re-employed Interest Rates

**131** DROP Member Count Roll Forward

**131** Actuarial Valuation Information  
– Pension Trust Fund

**132** Historical Annual Investment Results

### **DEBT CAPACITY INFORMATION**

### **DEMOGRAPHIC AND ECONOMIC INFORMATION**

**133** Number of Employer Units

### **OPERATING INFORMATION**

**134** Retired Membership by Type of Benefits and  
Average Annual Allowance

**135** Schedule of Average Benefits

**136** Principal Participating Employers

**137** OP&F Employee Budgeted Position Counts

**137** Personnel Salaries by Year

**137** OP&F Budget

**138** Other Operating Statistics

**139** Death Benefit Fund

### **LIST OF PROFESSIONAL ACRONYMS AND SYMBOLS**



# INTRODUCTION

2019 COMPREHENSIVE ANNUAL  
FINANCIAL REPORT

**BOARD OF TRUSTEES**

**ADMINISTRATIVE STAFF**

**PROFESSIONAL CONSULTANTS**

**AWARDS**

**LETTER OF TRANSMITTAL**

**DEMOGRAPHICS AND ECONOMIC IMPACT**

## BOARD OF TRUSTEES



**Robert E. Britt, II**



**Stephen A. Corvi**



**Marco J. Miller**



**Daniel J. Desmond**



**Edward L. Montgomery**



**John L. Wainscott**



**J. David Heller**



**Charles O. Moore**



**Karin Maloney Stifler**

### About the Board of Trustees

Ohio law provides for the Ohio Police & Fire Pension Fund (OP&F) Board of Trustees to be comprised of nine members. There are six employee members elected to four-year terms by their respective member groups: two active representatives of police departments, two active representatives of fire departments, one retired police officer and one retired firefighter. The Board of Trustees also includes three statutory members. Each statutory member – one appointed by the Governor of Ohio, one by the Ohio Treasurer of State and one appointed jointly by the Ohio Senate President and the Ohio Speaker of the House – must have professional investment expertise.

The OP&F Board of Trustees appoints the Executive Director, an actuary and other advisors necessary for the transaction of business. By law, the Ohio Treasurer of State is custodian of OP&F's funds. The Board of Trustees meets monthly, except for two months each year. In 2019, the Board of Trustees did not meet in the months of July and November. In 2020, the Board of Trustees will not meet in the months of July and November. The Board of Trustees receives no compensation, but is reimbursed for necessary expenses.

### Board of Trustee Members

**Robert E. Britt, II**

Toledo Police

**Stephen A. Corvi**

Columbus Fire

**Marco J. Miller**

Retired, Columbus Fire

**Daniel J. Desmond, Chair**

Toledo Fire

**Edward L. Montgomery, Chair Elect**

Columbus Police

**John L. Wainscott, Vice Chair**

Retired, Cincinnati Police

**J. David Heller**

Investment Expert Member, appointed by the Ohio Senate and the Ohio House of Representatives

**Charles O. Moore**

Investment Expert Member, appointed by the Governor of Ohio

**Karin Maloney Stifler**

Investment Expert Member, appointed by the Ohio Treasurer of State

## ADMINISTRATIVE STAFF



Left to right: Caren R. Sparks, Theodore G. Hall, John J. Gallagher, Jr., Scott K. Miller, Keisha D. Proctor, Brian C. O'Brien, Jennifer L. Harville, Mary Beth Foley, and David B. Graham

### Executive Staff

**John J. Gallagher, Jr.**  
Executive Director

**Mary Beth Foley**  
General Counsel

**Brian C. O'Brien**  
Business and Technology Solutions Director

**Theodore G. Hall**  
Chief Investment Officer

**Jennifer L. Harville**  
Member Services Director

**Scott K. Miller**  
Deputy Executive Director

**Caren R. Sparks**  
Chief Audit Executive/Privacy and Ethics Officer

**Keisha D. Proctor**  
Human Resources Director

**David B. Graham**  
Communications Director

### Professional Consultants *(not pictured)*

**Actuary**  
Cavanaugh Macdonald Consulting, LLC

**Legal Counsel**  
Ohio Attorney General, the Honorable Dave Yost

**Custodian of OP&F's Funds**  
Ohio Treasurer of State, Robert Sprague

**Custodial Banks**  
Huntington National Bank - Domestic  
Northern Trust - International

**Independent Accountants**  
RSM US LLP  
(Under contract with the Ohio Auditor of State)

**Medical Advisors**  
Gregory M. Jewell, M.D., M.S., M.M.M.,  
OP&F Board Medical Advisor

Joel S. Steinberg, M.D.,  
Disability Evaluation Panel Medical Advisor

**Investment Consultants and Money Managers**  
(See page 77)

**Schedule of Brokers' Fees Paid**  
(See page 78)

## AWARDS

*OP&F has been recognized by financial experts for their commitment to the highest possible fiscal standards. OP&F is honored to have been recognized with the following:*



### 2018 CERTIFICATE OF ACHIEVEMENT FOR EXCELLENCE IN FINANCIAL REPORTING

For 30 years, the Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to OP&F for its Comprehensive Annual Financial Report. In order to be awarded a Certificate of Achievement, a government must publish an easily readable and efficiently organized comprehensive annual financial report that satisfies both generally accepted accounting principles and applicable legal requirements.



### 2019 DISTINGUISHED BUDGET PRESENTATION AWARD

OP&F was again recognized by GFOA's Distinguished Budget Presentation Award in 2019, representing the 18th consecutive year OP&F has achieved this distinction. OP&F has received the award annually since 2002. The GFOA established the Distinguished Budget Presentation Awards Program in 1984 to encourage and assist state and local governments to prepare budget documents of the very highest quality that reflect both the guidelines established by the National Advisory Council on State and Local Budgeting and the GFOA's best practices on budgeting and then to recognize individual governments that succeed in achieving that goal.

## AWARDS



### 2018 AWARD FOR OUTSTANDING ACHIEVEMENT IN POPULAR ANNUAL FINANCIAL REPORTING

For 18 years, the GFOA has awarded a Certificate of Outstanding Achievement in Popular Annual Financial Reporting to OP&F for its Popular Annual Financial Report. This award is a prestigious national award recognizing conformance with the highest standards of creativity, presentation, understandability and reader appeal for preparation of governmental popular reports.



### 2019 PUBLIC PENSION STANDARDS AWARD

Awarded to OP&F by the Public Pension Coordinating Council (PPCC). OP&F has received the award annually since 2009. This award recognizes OP&F's professional standards attained for administration. The PPCC's standards were established in 2002 to promote excellence in pension plan design and administration. These standards serve as a benchmark by which to measure current practices of defined benefit plans.

# LETTER OF TRANSMITTAL



140 East Town Street / Columbus, Ohio 43215-5164 / Tel. (614) 228-2975 / [www.op-f.org](http://www.op-f.org)

June 30, 2020

Dear Chair and Members of the Board of Trustees:

We are pleased to submit to you the Comprehensive Annual Financial Report (CAFR) of the Ohio Police & Fire Pension Fund (OP&F) for the fiscal year ending Dec. 31, 2019. OP&F's management is responsible for the accuracy of the data presented here, as well as the completeness and fairness of the presentation. This CAFR was prepared to aid interested parties in assessing OP&F's financial status on Dec. 31, 2019 and its results for the year then ended.

## **ACCOUNTING SYSTEM AND INTERNAL CONTROLS**

The financial statements were prepared in accordance with accounting principles generally accepted in the United States of America (U.S.) applicable to governmental units, including the pronouncements of the Governmental Accounting Standards Board (GASB). Additional information on OP&F's significant accounting policies is contained in the Notes to the Basic Financial Statements in the Financial Section.

Management is responsible for establishing and maintaining an effective internal control structure designed to ensure that the assets of OP&F are protected from loss, theft, or misuse; and to ensure that adequate accounting data is compiled to allow for the preparation of Basic Financial Statements in conformity with accounting principles generally accepted in the U.S. The internal control structure is designed to provide reasonable, but not absolute, assurance that these objectives are met. The concept of reasonable assurance recognizes that:

- (1) the cost of a control should not exceed the benefits likely to be derived; and
- (2) the valuation of costs and benefits requires estimates and judgments by management.

Management believes its internal control structure meets these objectives.

## **OP&F HISTORY AND OVERVIEW**

OP&F is a cost-sharing, multiple-employer public employee retirement system and was created by the Ohio General Assembly in 1965, replacing 454 separate local police and firefighter relief and pension funds in Ohio. OP&F began operating as a statewide Retirement Fund on Jan. 1, 1967. On that date, the local pension funds transferred their assets and liabilities to OP&F. Assets transferred to OP&F totaled approximately \$75 million, while OP&F's actuary computed the liabilities accrued up to 1966 at approximately \$490 million. Employers are paying the remaining unfunded accrued liability, which began in 1969, over a 67-year period. As of Dec. 31, 2019, the balance totaled nearly \$18.9 million.

OP&F provides pension, disability, deferred retirement option plan (DROP) and a health care stipend benefit to qualified members. In addition, OP&F provides survivor benefits, death benefits and a health care stipend benefit for eligible survivors, spouses, children and dependent parents. Please refer to the Plan Summary in the Actuarial Section for further information on plan benefits.

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 (fire only), villages, joint fire districts or other political subdivisions. In order to become a member of OP&F, a full-time firefighter is 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 Ohio Revised Code (ORC). The table below is a tabulation of current participating employers at Dec. 31, 2019:

#### PARTICIPATING EMPLOYERS

	Police	Fire	Total
Municipalities	248	201	449
Townships	–	170	170
Villages	278	37	315
<b>TOTAL</b>	<b>526</b>	<b>408</b>	<b>934</b>

#### FINANCIAL OVERVIEW

OP&F receives virtually all of its funds from the following sources: investment earnings, employer contributions, member contributions, state subsidies and reimbursements. Additions to the fiduciary net position were \$3,273.0 million in 2019 which included contributions received from employers and members as well as appreciation on investments due to a positive return of 17.89%.

Overall contributions decreased by 4.7% in 2019. Although member and employer contributions increased 4.1%, this decrease is due to the transition made on Jan. 1, 2019 from a self-funded retiree group health care plan to a tax-free reimbursement stipend program. Under the new stipend plan, beneficiaries no longer have health care contributions deducted from their benefits payments.

The statutory employer contribution rate remained unchanged from the prior year at 19.5% for police employers and 24% for fire employers. The statutory member contribution rate also remained unchanged from the prior year at 12.25% for both police and fire members. Both member and employer contributions are due monthly.

Statutory penalties are assessed if payments and/or the member contribution reports are received late and if a pre-employment physical is received late. It is OP&F's goal to help employers avoid penalty situations through employer education, courtesy calls and online tools. For example, just before each due date, OP&F sends an automated voice message to any employer who has not yet submitted their contribution payment and/or payroll report. OP&F also offers to our employers the ability to report electronically using OP&F's secured Employer Self Serve Web and to pay electronically using the online Automated Clearing House (ACH) payment options. By promoting these options and training employers on how to use them, a substantial reduction in penalties has resulted.

	2019	
<b>Additions to Fiduciary Net Position</b> ( <i>dollars in millions</i> )	<b>Amount</b>	<b>Percent</b>
Net Investment Income	\$2,434.3	74.4%
Contributions	818.2	25.0%
Other Additions	20.5	0.6%
<b>TOTAL ADDITIONS</b>	<b>\$3,273.0</b>	<b>100.0%</b>

<b>Deductions to Fiduciary Net Position</b> <i>(dollars in millions)</i>	<b>2019</b>	
	<b>Amount</b>	<b>Percent</b>
Benefits	\$1,457.1	97.6%
Refund of Member Contributions	13.7	0.9%
Administrative Expenses	21.8	1.5%
<b>TOTAL DEDUCTIONS</b>	<b>\$1,492.6</b>	<b>100.0%</b>

Benefit payments represent the largest deduction and usage of the additions to fiduciary net position. In 2019, OP&F experienced:

- A 5.3% increase in retirement benefits. This increase is due to a cost-of-living allowance (COLA) for eligible benefit recipients and a 0.7% increase in the number of beneficiaries receiving pension benefits.
- A 64.7% decrease in the amount of health care benefit payments. This decrease is due to the transition made on Jan. 1, 2019, from a self-funded retiree group health care plan to a tax-free reimbursement stipend benefit.
- An 18.8% increase in DROP benefits. DROP benefits paid out fluctuate from year-to-year based on the timing of member requests to withdraw their funds on account.
- A 24.9% decrease in contributions refunded. Upon termination of active service in a police or fire department, a member may withdraw their accumulated employee contributions on deposit with OP&F. Similar to DROP benefits, contribution refunds paid out fluctuate from year-to-year based on the timing of member requests to withdraw their funds on account.
- A 28.8% increase in administrative services. This increase is primarily due to an increase in GASB 68 pension expense and GASB 75 OPEB expense. In accordance with GASB 68 and 75, OP&F is required to amortize a proportionate share of OPERS pension and OPEB liability and thus recognize a portion of this liability as pension and OPEB expense based on the amortization schedule.
- Other deductions in 2019 were not material to the overall change in plan assets.

Please refer to the Management's Discussion and Analysis in the Financial Section for additional financial details.

#### **FUNDING PRACTICES AND ACTUARIAL OVERVIEW**

Funds are derived from the excess of additions over deductions and are accumulated by OP&F in order to meet current and future benefit obligations to retirees and other beneficiaries. OP&F experienced a \$1,780.4 million increase in the 2019 fiduciary net position primarily due to the appreciation of the fair value of investments. Beginning Jan. 1, 2019, OP&F began offering to its members a tax-free reimbursement stipend for eligible health care expenses. A portion of employer contributions and a portion of investment income (and losses) are set aside to operate the health care stipend program.

In 2019, OP&F investment portfolio returned a positive 17.89%. As of Dec. 31, 2019, total investments at fair value stood at \$16.48 billion.

In the annual actuarial report dated Jan. 1, 2019 completed by Cavanaugh Macdonald Consulting, OP&F achieved a 29-year amortization period. OP&F continues to be compliant with Ohio's requirement of a funding period of 30 years or less. A funding period is the amount of time it is estimated to pay off all unfunded obligations. The actuarial report also showed a slight decline in the funded ratio in 2019 to 69.4% (compared to 69.9% in 2018). The funded ratio indicates the percentage of the actuarial value of assets available to pay off all pension obligations of the system. These results reflect the changes in assumptions from the experience study completed in 2017 which reduced the assumed rate of return or discount rate from 8.25% to 8.00%. The actuarial valuation confirms that OP&F is able to meet its current and

future pension obligations. For more information on assumption changes as a result of the experience study, please refer to the Actuarial Section.

OP&F is not required by statute or GASB to pre-fund health care. As of Jan. 1, 2019 OP&F's Health Care Stabilization Fund (HCSF) had a solvency period until November 2032, or approximately 14 more years. Extending the solvency period of the HCSF can be attributed to the transition from a self-insured health care model to a stipend-based model for retirees and beneficiaries, which was implemented on Jan. 1, 2019.

A report by Wilshire Associates, an independent investment consultant, showed that OP&F's investment portfolio continues to weather challenging market fluctuations. In 2019, the total portfolio's investment return was 17.89% placing it in the 57th percentile of Wilshire's Master Trusts – All Plans Universe, a common source to establish peer group rankings. With 2019's result, OP&F's three-year annualized return now stands at 9.80%, while the five-year annualized return was 8.16%. OP&F's 10-year annualized return was 9.75%, comfortably ahead of OP&F's 8.00% assumed rate of return. As mentioned earlier, the total portfolio's 2019 results ranked in the 57th percentile of Wilshire's Master Trusts – All Plans Universe, while the three-year, five-year and 10-year results ranked in the 37th, 7th and 4th percentiles, respectively, of that same peer universe.

Please see the Notes to the Basic Financial Statements, the Statistical Section and the Required Supplementary Information (RSI) Sections of this report for more detailed information.

#### **INVESTMENT POLICY**

OP&F invests all available funds in order to maximize both current income and long-term appreciation. The primary objective of OP&F's investment policy is to ensure that OP&F meets its responsibilities for providing retirement and other benefits. The investment portfolio is diversified to provide adequate cash flow and to provide the highest possible total return for OP&F's assets while maintaining an acceptable level of risk. Over the past year, OP&F's total gross rate of return on its investment portfolio was a positive 17.89% in 2019.

Details of portfolio composition, rates of return, analysis of significant economic conditions, and additional information concerning OP&F's investment policy are provided in the Investment Section of this report.

#### **MATERIAL PLAN AMENDMENTS**

There were no material plan amendments in 2019. See the Actuarial Section for the assumptions used within this report.

#### **INDEPENDENT AUDIT**

RSM US LLP, independent certified public accountants, audited the financial statements of OP&F for the years ended Dec. 31, 2019, and their opinion thereon is included in the Financial Section.

#### **NOTES TO BASIC FINANCIAL STATEMENTS**

The Notes to the Basic Financial Statements, which follow the Basic Financial Statements, contain additional information and are an integral part of such statements.

#### **CERTIFICATE OF ACHIEVEMENT**

The Government Finance Officers Association of the United States and Canada (GFOA) awarded a Certificate of Achievement for Excellence in Financial Reporting to OP&F for its CAFR for the fiscal year ended Dec. 31, 2018. The Certificate of Achievement is the highest form of recognition for excellence in state and local government financial reporting.

In order to be awarded a Certificate of Achievement, a government unit must publish an easily readable and efficiently organized CAFR, whose contents conform to program standards. Such reports must satisfy both accounting principles generally accepted in the U.S. and applicable legal requirements. A Certificate of Achievement is valid for a period of one year only. OP&F believes the current report continues to conform to the Certificate of Achievement Program requirements and is submitting it to the GFOA to determine its eligibility for another certificate.

#### **ACKNOWLEDGMENTS**

The preparation and contents of this report reflect the combined efforts of OP&F's staff under the direction of the Board of Trustees and are the responsibility of OP&F's management. It is intended to provide complete and reliable information as a basis for making management decisions, to disclose compliance with legal provisions and as a means of demonstrating responsible stewardship for the assets contributed by the members and their employers.

The cooperation of OP&F's employers is vital to our success and is greatly appreciated.

Respectfully submitted,



John J. Gallagher, Jr.  
Executive Director



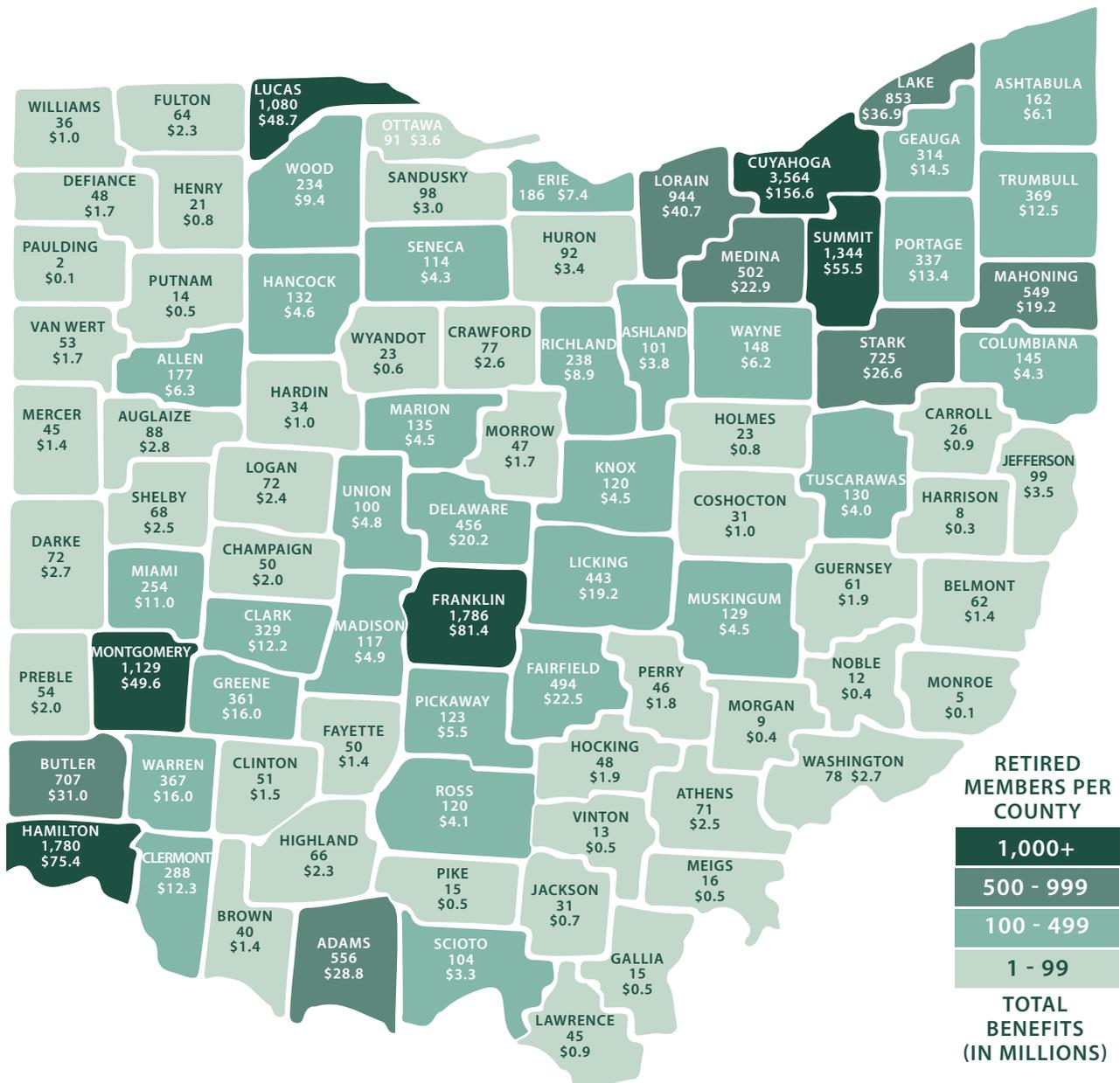
Scott K. Miller  
Deputy Executive Director

# DEMOGRAPHICS AND ECONOMIC IMPACT

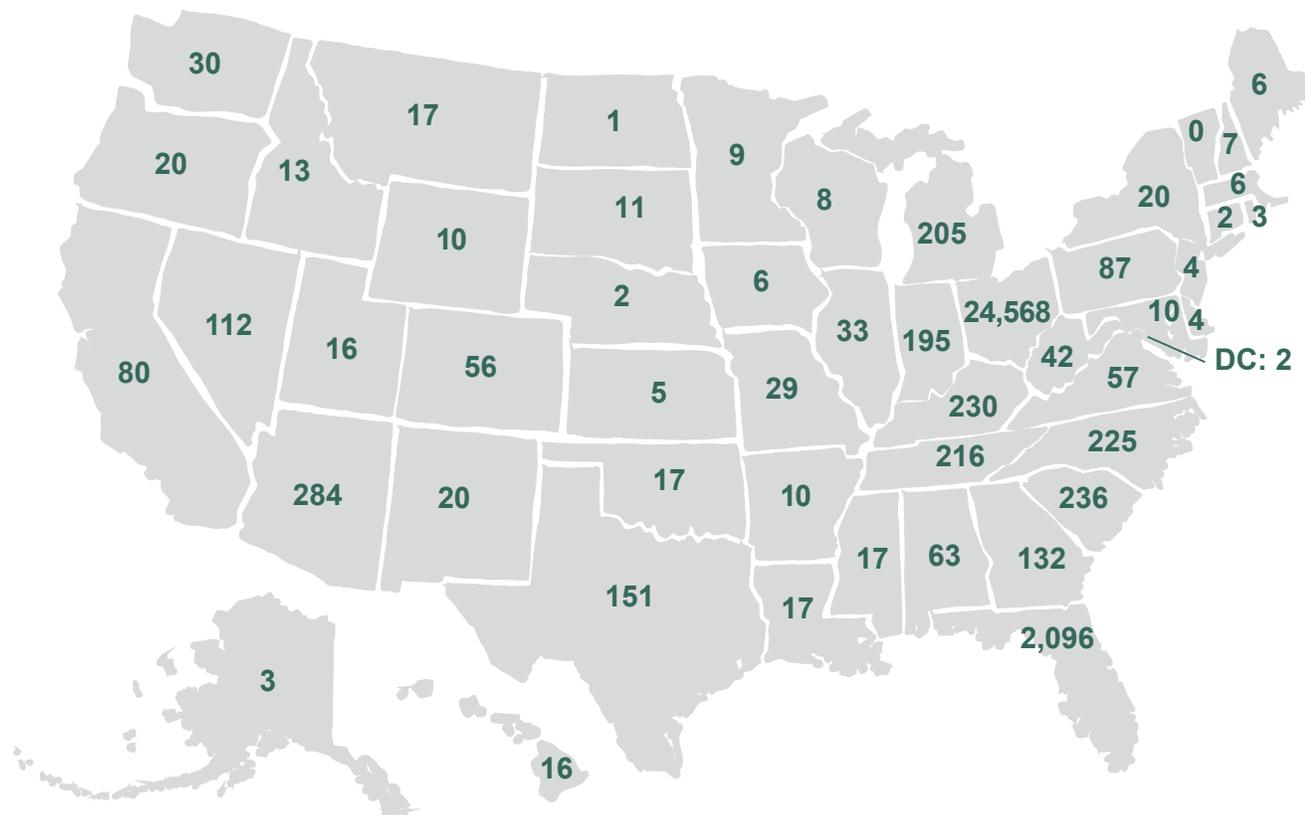
## MEMBERSHIP RESIDENCE

Type of Member	Total Persons	Ohio Residents	Non-Residents	Percent of Non-Residents
Active Members (including DROP)	29,247	28,763	484	1.7%
Retirees	22,610	19,070	3,540	15.7%
Survivors	6,824	5,498	1,326	19.4%
<b>TOTAL</b>	<b>56,681</b>	<b>53,331</b>	<b>5,350</b>	<b>9.1%</b>
Active Members in DROP	4,306	4,251	55	1.3%

## RETIREEES AND BENEFITS PAID BY COUNTY



## BENEFICIARIES BY STATE



## BENEFICIARIES BY COUNTRY

Location	Retirees
United States	29,409
Canada	10
Columbia	1
France	1
Ireland	1
Micronesia	2
Philippines	3
Portugal	1
Puerto Rico	3
Thailand	1
Virgin Islands	1
Armed Forces, Europe	1

## ECONOMIC IMPACT ANALYSIS

OP&F hired the University Of Cincinnati Economics Center to conduct an economic impact analysis of the Ohio Police & Fire Pension Fund in 2018. The Economics Center calculated the economic and fiscal impacts of OP&F's operations and capital expenditures using salary, non-wage expenditure, and capital expenditure data provided. These data, provided by OP&F, were applied to Economic Modeling Specialists International (EMSI) input-output model multipliers. The EMSI model captures the interdependencies of an economy's various industries, quantifying how direct expenditures on goods or services by a particular industry (or to individuals in the form of wages) yield additional expenditures within that economy. The State of Ohio is the primary geographic area of analysis for this study.

OP&F provides vital pension and disability benefits to the State's full-time and retired police officers and firefighters, as well as their beneficiaries. OP&F membership totaled approximately 59,000 individuals as of year-end 2018, with a nearly even split between active members and retirees and their beneficiaries. OP&F paid out \$1.17 billion in gross benefits to members worldwide in 2018, with approximately \$1.00 billion going to Ohio residents. Of this total, these Ohioans spent approximately \$811 million on products and services in the Ohio economy in 2018. This direct spending supported nearly 7,100 direct jobs and approximately \$276 million in employee earnings. The direct spending, in turn, generated indirect impacts of approximately \$871 million in spending, 6,885 jobs, and nearly \$312 million in earnings. The Economics Center estimates that household spending impacts in Ohio resulting from OP&F pension payments totaled \$1.68 billion in output, supported nearly 14,000 jobs, and more than \$587 million in employee

earnings. OP&F operations and capital spending also benefited the Ohio economy in 2018, with combined total economic impacts of approximately \$147 million in spending, 410 jobs, and nearly \$29 million in employee earnings. The Economics Center estimates that OP&F's total economic impact in 2018 to the Ohio economy included approximately \$1.83 billion in output, more than 14,000 jobs, and more than \$616 million in employee earnings.

OP&F's operations and pension distributions also generated substantial fiscal impacts to the State of Ohio, Ohio Counties and Transit Authorities, and the City of Columbus in 2018. OP&F distributions to Ohio residents generated approximately \$23.5 million in income tax revenues for the State of Ohio. In addition, beneficiaries' purchases of goods and services generated approximately \$13.8 million in State sales tax revenues, as well as \$2.7 million in County sales tax revenues and \$0.7 million in Transit Authority revenues. Earnings paid to OP&F employees in 2018 resulted in income tax collections of approximately \$338,000 by the State of Ohio and approximately \$266,000 by the City of Columbus. Total fiscal impacts of OP&F operations, pension distributions, and resulting household spending in 2018 totaled \$41.3 million which included approximately \$37.6 million to the State of Ohio, \$2.7 million to Ohio Counties, \$0.7 million to Ohio Transit Authorities, and \$0.3 million to the City of Columbus.

The complete report of the economic impact analysis of OP&F conducted by the University of Cincinnati Economic Center can be found on [OP&F's website](#).

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# FINANCIAL

## 2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT

### **INDEPENDENT AUDITOR'S REPORT MANAGEMENT'S DISCUSSION AND ANALYSIS (UNAUDITED)**

#### **BASIC FINANCIAL STATEMENTS**

Statement of Fiduciary Net Position

Statement of Changes in Fiduciary  
Net Position

Notes to Basic Financial Statements

#### **REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)**

Schedule of Changes in the Employers' Net Pension Liability

Schedule of Employers' Net Pension Liability (Asset)

Schedule of Employer Contributions - Pension Trust Fund

Schedule of Investment Returns

Notes to Required Supplementary Pension Information

Schedule of Changes in Net OPEB  
Liability and Related Ratios

Schedule of Net OPEB Liability (Asset)

Schedule of Employer Contributions  
- Retiree Health Care Trust Fund

Schedule of Investment Returns

Notes to Required Supplementary OPEB Information

Schedule of OP&F's Proportionate Share of the Net Pension  
Liability Ohio Public Employees Retirement Plan

Schedule of Contributions Ohio Public Employees  
Retirement Plan

Schedule of OP&F's Proportionate Share of the OPEB Liability  
Ohio Public Employees Retirement Plan

Schedule of OPEB Contributions Ohio Public Employees  
Retirement Plan

#### **ADDITIONAL INFORMATION**

Schedule of Administrative Expenses

Schedule of Investment Expenses

Combining Statement of Changes in Assets and Liabilities -  
Public Safety Officers Death Benefit Fund

# INDEPENDENT AUDITOR'S REPORT

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RSM US LLP

## Independent Auditor's Report

The Board of Trustees  
Ohio Police & Fire Pension Fund and  
The Honorable Keith Faber

### Report on the Financial Statements

We have audited the accompanying financial statements of Ohio Police & Fire Pension Fund, which comprise the statement of fiduciary net position as of December 31, 2019, and the related statement of changes in fiduciary net position for the year ended December 31, 2019, and the related notes to the financial statements, (collectively, basic financial statements).

### Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of Ohio Police & Fire Pension Fund as of December 31, 2019, and the changes in fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

## Other Matters

### *Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that management's discussion and analysis and the required supplementary information, as listed in the table of contents, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### *Other Information*

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise Ohio Police & Fire Pension Fund's basic financial statements. The additional information, including the schedule of administrative expenses, schedule of investment expenses, and the combining statement of changes in assets and liabilities – public officers' death benefit fund, as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The additional information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the additional information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

The introductory, investments, actuarial and statistical sections, as listed in the table of contents have not been subjected to the auditing procedures applied in the audit of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on them.

### **Other Reporting Required by Government Auditing Standards**

In accordance with *Government Auditing Standards*, we have also issued our report dated June 30, 2020 on our consideration of Ohio Police & Fire Pension Fund's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of Ohio Police & Fire Pension Fund's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Ohio Police & Fire Pension Fund's internal control over financial reporting and compliance.

*RSM US LLP*

Columbus, Ohio  
June 30, 2020

# MANAGEMENT’S DISCUSSION AND ANALYSIS (UNAUDITED)

This Management Discussion and Analysis (MD&A) of OP&F’s financial performance provides a narrative overview of financial activities for the fiscal year ended Dec. 31, 2019. The MD&A is designed to focus on the current year’s activities, resulting changes and currently known facts. OP&F encourages reading this in conjunction with the Basic Financial Statements, Notes to the Basic Financial Statements and the Letter of Transmittal included in the Introductory Section of this CAFR.

## FINANCIAL HIGHLIGHTS

Additions are received primarily from investment income and employer and member pension contributions. For fiscal year 2019, these additions totaled \$3,273.0 million compared to \$395.6 million in 2018, which is a 727.4% increase. Investment income can fluctuate dramatically because it includes realized and unrealized investment gains and losses based on performance of global capital markets.

The employer contribution rates of 19.5% for police and 24% for fire remained unchanged in both 2019 and 2018. The member contribution rate was 12.25% for both police and fire in 2019 and 2018.

Deductions are incurred primarily for the purpose for which OP&F was created; the payment of pension, disability and survivor benefits to qualified members and survivors. Included in the deductions from OP&F’s fiduciary net position for 2019 were benefits for retirement, DROP, disability, health care and survivors. Also included were contribution refunds, administrative and other expenses. Pension benefits are

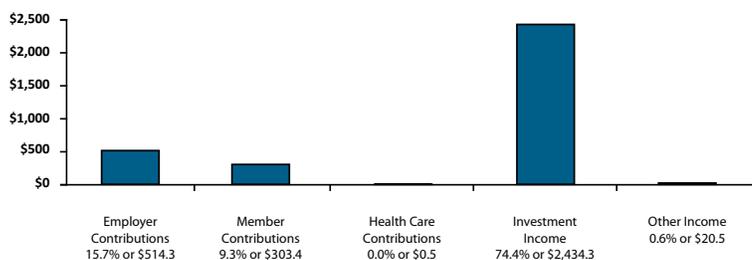
funded through a combination of investment earnings and employer and member contributions. Health care stipends are funded through a portion of employer contributions and investment income. Deductions totaled \$1,492.6 million in 2019 and were \$1,549.4 million in 2018, which is a 3.7% decrease over 2018. Please refer to the Plan Summary in the Actuarial Section for further information on plan benefits.

OP&F administers the State of Ohio Public Safety Officers Death Benefit Fund. This program was established by the State of Ohio to provide monthly benefit payments to eligible surviving family members of Ohio public safety officers who have been killed in the line of duty or die of a duty-related injury or illness. Funds are disbursed to OP&F on a quarterly basis and are paid monthly by OP&F to eligible recipients. Annually the unused balance is returned to the State of Ohio. The Public Safety Officers Death Benefit Fund is considered to be an agency fund administered by OP&F. The Death Fund assets of \$1.2 million and \$0.2 million as well as the related liability for unpaid benefits at Dec. 31, 2019 and 2018, respectively, are included in the accompanying financial statements.

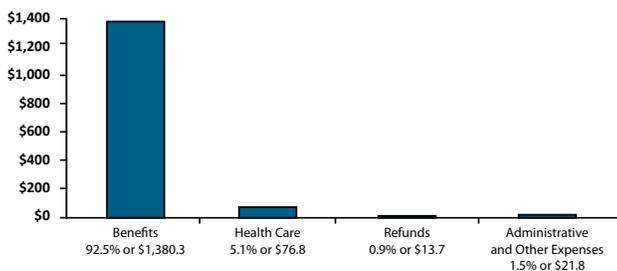
## OVERVIEW OF FINANCIAL STATEMENTS

Following the MD&A are the Statements of Fiduciary Net Position and the Statements of Changes in Fiduciary Net Position. OP&F’s financial statements are prepared using the accrual basis of accounting and are in compliance with applicable GASB Statements.

### 2019 ADDITIONS (DOLLARS IN MILLIONS) \$3,273.0



### 2019 DEDUCTIONS (DOLLARS IN MILLIONS) \$1,492.6



The Statement of Fiduciary Net Position provides a snapshot view at year-end for the amount OP&F has accumulated in assets to pay for benefits. The Statement of Changes in Fiduciary Net Position reflects what has happened to OP&F's assets during the fiscal year. If the fiduciary net position increased, then additions were greater than the deductions. If the fiduciary net position decreased, then additions were less than the deductions.

In addition to the Basic Financial Statements and accompanying Notes to the Basic Financial Statements, certain Required Supplementary Information (RSI) is provided. The RSI consists of information pertaining to OP&F's actuarial methods and assumptions and provides data on the net pension liability and the changes in net pension liability. Also included in the RSI is data on contributions from employers, along with other information useful in evaluating the financial condition of OP&F. Following the RSI are Schedules of Administrative Expenses and the Schedule of Investment Expenses.

In accordance with GASB Statement No. 68, Accounting and Financial Reporting for Pensions, which significantly revised accounting for pension costs and liabilities, OP&F recorded as a liability its proportionate share of the Ohio Public Employees Retirement System (OPERS) Net Pension Liability (NPL). However, OP&F is not responsible for certain key factors affecting the balance of this liability. In Ohio, the employee shares the obligation of funding pension benefits with the employer.

Employee contribution rates are set by Ohio law. State law permits the Board of Trustees to adjust the employee contribution rate if, in consultation with its actuary following an actuarial review, OP&F determines that an adjustment to the rate is appropriate. The Board of Trustees may increase the employee contribution rate if it determines that the increase is necessary to preserve the fiscal integrity of the pension fund. Likewise, the Board of Trustees may decrease the employee contribution rate if it determines that the decrease would not materially impair the fiscal integrity of the pension fund.

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. OP&F's benefit provisions are also determined by state statute.

In Ohio, at this time it does not appear that there are any legal means to enforce payments of the net pension liability of the pension system by public employers. The pension system is responsible for the administration of the plan.

Most long-term liabilities have set repayment schedules or, in the case of compensated absences (i.e. sick and vacation

leave) are satisfied through paid time-off or termination payments. There is no repayment schedule for the NPL. Changes in pension benefits, contribution rates and return on investments affect the balance of the net pension liability, but are outside the control of the public employer. In the event that contributions, investment returns and other changes are insufficient to keep up with required pension payments, state statute does not assign/identify the responsible party for the unfunded portion.

In 2017, OP&F implemented GASB Statement No. 74, Financial Reporting for Post-Employment Benefit Plans Other Than Pension Plans, which resulted in an additional note disclosure to the financial statements and additional Required Supplementary Information related to OP&F's Retiree Health Care program. In 2018, OP&F implemented the provisions of GASB Statement No. 75, Accounting and Financial Reporting for Post-Employment Benefits Other Than Pensions, and recorded a liability representing OP&F's proportionate share of OPERS' Other Post-Employment Benefit (OPEB) liability.

GASB Statement No. 75 is very similar to GASB Statement No. 68, in that, OP&F is not responsible for certain key factors affecting the balance of this OPEB liability. Both standards affect financial reporting only, not funding. The requirement to report these liabilities may represent a significant figure on OP&F's financial statements, but does not affect the amount OP&F is required to fund under Ohio law. In Ohio, governmental employers are not legally bound to pay off the unfunded liabilities of OPERS. The intent of the standards is to enhance both the pension and OPEB related information in financial reports by providing greater transparency and to standardize the valuation practices from entity to entity.

In 2019, OP&F's Master Limited Partnership (MLP) asset class was renamed Midstream Energy Infrastructure. The holdings of the Midstream Energy Infrastructure asset class are broken out in the financial statements between MLPs and the increasingly larger number of C-corp/equities held within this asset class.

A condensed version of OP&F's financial information is being provided as part of this discussion.

**CONDENSED FIDUCIARY NET POSITION INFORMATION (DOLLARS IN MILLIONS)**

	2019	2018	2019 Change	
			Amount	Percent
Cash and Short-term Investments	\$1,124.2	\$948.7	\$175.5	18.5%
Receivables	173.0	240.6	(67.6)	(28.1)%
Investments, at Fair Value	15,793.3	14,557.1	1,236.2	8.5%
Capital Assets, Net of Depreciation	15.3	15.4	(0.1)	(0.6)%
Other Assets	-	0.3	(0.3)	(100.0)%
<b>TOTAL ASSETS</b>	<b>17,105.8</b>	<b>15,762.1</b>	<b>1,343.7</b>	<b>8.5%</b>
DEFERRED OUTFLOWS	8.3	5.2	3.1	59.6%
Benefits and Accounts Payable	78.9	81.4	(2.5)	(3.1)%
Investments Payable	515.5	944.1	(428.6)	(45.4)%
<b>TOTAL LIABILITIES</b>	<b>594.4</b>	<b>1,025.5</b>	<b>(431.1)</b>	<b>(42.0)%</b>
DEFERRED INFLOWS	4.4	6.9	(2.5)	(36.2)%
<b>FIDUCIARY NET POSITION, END OF YEAR</b>	<b>\$16,515.3</b>	<b>\$14,734.9</b>	<b>\$1,780.4</b>	<b>12.1%</b>

**CONDENSED CHANGES IN FIDUCIARY NET POSITION INFORMATION (DOLLARS IN MILLIONS)**

	2019	2018	2019 Change	
			Amount	Percent
Contributions	\$818.2	\$858.6	\$(40.4)	(4.7)%
Net Investment Gain/(Loss)	2,434.3	(487.9)	2,922.2	598.9%
Other Additions	20.5	24.9	(4.4)	(17.7)%
<b>TOTAL ADDITIONS</b>	<b>3,273.0</b>	<b>395.6</b>	<b>2,877.4</b>	<b>727.4%</b>
Benefits	1,457.1	1,514.1	(57.0)	(3.8)%
Refunds	13.7	18.3	(4.6)	(25.1)%
Administrative Expenses and Other	21.8	17.0	4.8	28.2%
<b>TOTAL DEDUCTIONS</b>	<b>1,492.6</b>	<b>1,549.4</b>	<b>(56.8)</b>	<b>(3.7)%</b>
<b>Net Increase/(Decrease)</b>	<b>1,780.4</b>	<b>(1,153.8)</b>	<b>2,934.2</b>	<b>254.3%</b>
<b>Fiduciary Net Position, Beginning of Year</b>	<b>14,734.9</b>	<b>15,888.7</b>	<b>(1,153.8)</b>	<b>(7.3)%</b>
<b>FIDUCIARY NET POSITION, END OF YEAR</b>	<b>\$16,515.3</b>	<b>\$14,734.9</b>	<b>\$1,780.4</b>	<b>12.1%</b>

## FINANCIAL ANALYSIS

### FIDUCIARY NET POSITION

The fiduciary net position available for benefits and expenses in 2019 was \$16,515.3 million versus \$14,734.9 million in 2018, which represents a 12.1% net increase. The overall net increase in 2019 can be primarily attributed to net appreciation on the fair value of investments. Please refer to the Investment Section for additional information on OP&F's investment activities in 2019.

### REVENUE ADDITIONS TO FIDUCIARY NET POSITION

Based on the rounded numbers found on page six, overall contributions received by OP&F in 2019 decreased 4.7% or \$40.4 million compared to 2018. This decrease is primarily due to the change in OP&F's health care program from a self-funded plan with premium contributions received from eligible participants to a stipend based model with no premium contributions.

Pension contributions from employers increased \$24.4 million, or 5.0%, in 2019. Employer pension contribution increases are also due to an increase in the average annual salary and total annual payroll. Employer contributions are not impacted by DROP and the employer contributions associated with DROP participation are not allocated to the individual DROP accounts.

In 2019, pension contributions from members increased \$7.9 million, or 2.7%. The increase in 2019 can be attributed to the 1.8% increase in the average annual salary, from \$77,083 to \$78,488, and an increase in active member population, or contributing members, by 679 to 29,087, or by 2.4%.

In 2019, members purchasing service credit or transferring in their member contributions decreased by \$6.0 million, or 31.9% compared to 2018. These purchases and transfers-in fluctuate year-to-year based on the number and amount of the service credit being purchased by the membership and the number and amount of members transferring contributions from other retirement systems.

Contributions paid by members and beneficiaries for their share of health care costs decreased by 99.3% from \$73.2 million in 2018 to \$0.5 million in 2019. The decrease in the contributions for health care can be attributed to the implementation of the new retiree health care stipend model on Jan. 1, 2019.

In 2019, contributions received through the state-subsidy decreased \$40,323, from \$300,811 to \$260,488. This trend is due to a normal decline in the population of survivors receiving this subsidized benefit.

Investment net appreciation totaled \$2,434.3 million in 2019. The net appreciation of 2019 can be attributed to a positive gross return of 17.89% from OP&F's portfolio of investments. In 2018, investment net depreciation totaled \$487.9 million. The net depreciation of 2018 can be attributed to a negative gross return of 1.78% from OP&F's portfolio of investments.

### EXPENSE DEDUCTIONS FROM NET POSITION

Overall benefit deductions for service retirement, DROP, disability and survivors increased \$84.0 million or 6.5% in 2019. Part of the increases in pension benefits is due to increases in the number of retirees and beneficiaries. Service retirees increased by 318 individuals, or 2.1% in 2019, survivors and beneficiaries increased by four individuals, or 0.1% while disability retirees decreased by 117 individuals, or 1.9%. In addition DROP benefit distributions increased \$38.3 million or 18.9%.

In 2019, health care benefits decreased by 64.7% and gross health care payments totaled \$76.8 million and represented 5.2% of all plan deductions. In 2018, health care benefits totaled \$217.9 million and represented 14.1% of all plan deductions. The decreases in health care expenses in 2019 can be attributed to the implementation of the new retiree health care stipend model on Jan. 1, 2019 and the closing out of the self-funded plan.

Refunds to members decreased by \$4.6 million in 2019. These refunds include actual refunds of member contributions on deposit for inactive members.

# BASIC FINANCIAL STATEMENTS

## STATEMENT OF FIDUCIARY NET POSITION AS OF DEC. 31, 2019

	Pensions	Post-Employment Health Care	2019 Total	Death Benefit Agency Fund
<b>Assets:</b>				
Cash and Short-term Investments	\$1,064,357,104	\$59,850,544	\$1,124,207,648	\$1,178,907
<b>Receivables:</b>				
Employers' Contributions	44,196,553	1,046,503	45,243,056	-
Members' Contributions	25,493,276	-	25,493,276	-
Accrued Investment Income	39,831,269	2,239,778	42,071,047	-
Investment Sales Proceeds	39,025,760	2,194,482	41,220,242	-
Local Funds Receivable	18,942,603	-	18,942,603	-
<b>TOTAL RECEIVABLES</b>	<b>167,489,461</b>	<b>5,480,763</b>	<b>172,970,224</b>	<b>-</b>
<b>Investments, at fair value:</b>				
Domestic Bonds	3,061,757,097	172,167,620	3,233,924,717	-
International Bonds	23,796,121	1,338,095	25,134,216	-
Mortgage and Asset-Backed Securities	526,442,549	29,602,727	556,045,276	-
Domestic Equities	3,423,991,124	192,536,633	3,616,527,757	-
International Equities	2,904,006,723	163,297,058	3,067,303,781	-
Real Estate	1,716,153,762	96,502,139	1,812,655,901	-
Commercial Mortgage Funds	34,270,847	1,927,106	36,197,953	-
Private Debt	562,200,916	31,613,479	593,814,395	-
Private Equity	1,342,853,182	75,510,835	1,418,364,017	-
Real Assets	463,258,002	26,049,757	489,307,759	-
Master Limited Partnerships	556,278,765	31,280,467	587,559,232	-
Domestic Derivatives	(1,966,555)	(110,583)	(2,077,138)	-
International Derivatives	(930,535)	(52,326)	(982,861)	-
<b>TOTAL INVESTMENTS</b>	<b>14,612,111,998</b>	<b>821,663,007</b>	<b>15,433,775,005</b>	<b>-</b>
Collateral on Loaned Securities	340,367,492	19,139,422	359,506,914	-
<b>Capital Assets, net of accumulated depreciation, where applicable:</b>				
Land	3,200,000	-	3,200,000	-
Building and Improvements	10,519,302	-	10,519,302	-
Furniture and Equipment	188,219	-	188,219	-
Computer Software and Hardware	1,369,629	-	1,369,629	-
<b>TOTAL CAPITAL ASSETS, NET</b>	<b>15,277,150</b>	<b>-</b>	<b>15,277,150</b>	<b>-</b>
Prepaid Expenses and Other	39,160	-	39,160	-
<b>TOTAL ASSETS</b>	<b>16,199,642,365</b>	<b>906,133,736</b>	<b>17,105,776,101</b>	<b>1,178,907</b>
<b>DEFERRED OUTFLOWS OF RESOURCES</b>				
Deferred Outflows - Pension and OPEB	5,086,953	-	5,086,953	-
<b>Liabilities:</b>				
Investment Commitments Payable	147,698,319	8,305,317	156,003,636	-
Accrued Administrative Expenses	45,849,785	-	45,849,785	-
Due to State of Ohio	-	-	-	1,178,907
Obligations Under Securities Lending	340,367,492	19,139,422	359,506,914	-
Other Liabilities	33,052,407	-	33,052,407	-
<b>TOTAL LIABILITIES</b>	<b>566,968,003</b>	<b>27,444,739</b>	<b>594,412,742</b>	<b>1,178,907</b>
<b>DEFERRED INFLOWS OF RESOURCES</b>				
Deferred Inflows - Pension and OPEB	1,170,508	-	1,170,508	-
<b>FIDUCIARY NET POSITION HELD IN TRUST FOR PENSION AND POST-EMPLOYMENT HEALTH CARE BENEFITS</b>				
	<b>\$15,636,590,807</b>	<b>\$878,688,997</b>	<b>\$16,515,279,804</b>	<b>\$-</b>

See the Notes to the Basic Financial Statements. The accompanying notes are an integral part of the financial statements.

# BASIC FINANCIAL STATEMENTS

## STATEMENTS OF CHANGES IN FIDUCIARY NET POSITION FOR THE YEAR ENDED DEC. 31, 2019

	Pensions	Post-Employment Health Care	2019 Total
<b>Additions:</b>			
From Contributions:			
Members'	\$303,413,682	\$-	\$303,413,682
Employers'	502,043,282	11,973,144	514,016,426
State of Ohio-Subsidies	260,488	-	260,488
Health Care Premiums	-	523,461	523,461
<b>TOTAL CONTRIBUTIONS</b>	<b>805,717,452</b>	<b>12,496,605</b>	<b>818,214,057</b>
<b>From Investment Income:</b>			
Net Appreciation (Depreciation)			
Value of Investments	1,915,798,237	108,036,683	2,023,834,920
Bond Interest	118,233,507	6,667,485	124,900,992
Dividends	105,650,209	5,957,881	111,608,090
Alternative Investment Income	133,669,755	7,537,974	141,207,729
Master Limited Partnership Income	55,834,646	3,148,656	58,983,302
Other Investment Income (Loss)	25,018,392	1,410,850	26,429,242
Less Investment Expenses	(52,439,162)	(2,957,176)	(55,396,338)
<b>NET INVESTMENT INCOME</b>	<b>2,301,765,584</b>	<b>129,802,353</b>	<b>2,431,567,937</b>
<b>From Securities Lending Activities:</b>			
Securities Lending Income	16,298,790	919,130	17,217,920
Securities Lending Expense	(13,707,456)	(772,998)	(14,480,454)
<b>NET INCOME FROM SECURITIES LENDING</b>	<b>2,591,334</b>	<b>146,132</b>	<b>2,737,466</b>
Interest on Local Funds Receivable	841,608	-	841,608
Other Income	56,250	19,647,113	19,703,363
<b>TOTAL ADDITIONS</b>	<b>3,110,972,228</b>	<b>162,092,203</b>	<b>3,273,064,431</b>
<b>Deductions:</b>			
Retirement Benefits	789,094,174	-	789,094,174
Disability Benefits	257,433,935	-	257,433,935
Health Care Benefits	-	76,826,595	76,826,595
Survivor Benefits	92,452,118	-	92,452,118
DROP Withdrawals	241,331,988	-	241,331,988
Contribution Refunds	13,715,712	-	13,715,712
Administrative Expenses	21,249,464	362,607	21,612,071
Other Expenses	160,837	-	160,837
<b>TOTAL DEDUCTIONS</b>	<b>1,415,438,228</b>	<b>77,189,202</b>	<b>1,492,627,430</b>
CHANGE IN FIDUCIARY NET POSITION	1,695,534,000	84,903,001	1,780,437,001
<b>FIDUCIARY NET POSITION - BEG OF YEAR</b>	<b>13,941,056,807</b>	<b>793,785,996</b>	<b>14,734,842,803</b>
<b>FIDUCIARY NET POSITION - END OF YEAR</b>	<b>\$15,636,590,807</b>	<b>\$878,688,997</b>	<b>\$16,515,279,804</b>

# NOTES TO BASIC FINANCIAL STATEMENTS (DEC. 31, 2019)

## 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The following are the significant accounting policies followed by OP&F.

### BASIS OF ACCOUNTING

OP&F's financial statements have been prepared using the accrual basis of accounting. Revenues are recognized when earned and expenses are recorded when a liability is incurred. Contributions are earned based on statutory requirements under Chapter 742 of the ORC.

### NEW ACCOUNTING PRONOUNCEMENTS

During the year ended Dec. 31, 2019, OP&F adopted the provisions of GASB Statement No. 83, Certain Asset Retirement Obligations. GASB Statement No. 84, Fiduciary Activities. GASB Statement No. 88, Certain Disclosures Related to Debt, including Direct Borrowings and Direct Placements. GASB Statement No. 89, Accounting for Interest Cost Incurred before the End of a Construction Period. GASB Statement No. 90, Majority Equity Interests – an amendment of GASB Statements No. 14 and No. 61. GASB Statement No. 95, Postponement of the Effective Date of Certain Authoritative Guidance, the requirements of this statement are effective immediately. The adoption of these had no material impact on the financial statements.

The GASB also issued the following pronouncements: GASB Statement No. 87, Leases, is effective for fiscal years beginning after June 15, 2021. GASB Statements No. 91, Conduit Debt Obligations, is effective for fiscal years beginning after Dec. 15, 2021. GASB Statement No. 92, Omnibus 2020, the requirements related to Statement 87 are effective upon issuance, the rest is effective for fiscal years beginning after June 15, 2021. GASB Statement No. 93, Replacement of Interbank Offered Rates, is effective for reporting periods ending after June 15, 2020. GASB Statement No. 94, Public-Private and Public-Public Partnerships and Availability Payment Arrangements, is effective for fiscal years beginning after June 15, 2022. OP&F is analyzing the impact that these GASB pronouncements will have on the financial statements.

### MANAGEMENT USE OF ESTIMATES

The preparation of the financial statements requires management to make a number of estimates and assumptions relating to the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the period. Significant items subject to estimates and assumptions include the fair value of certain investments, carrying amount of capital assets and

assets and obligations related to employee and member benefits. Actual results could differ from those estimates.

### INVESTMENTS

Investment purchases and sales are recorded on a trade-date basis. Dividend income is recognized on the ex-dividend date. Income on bonds, private equity, private debt, real estate funds and interest income are recognized when earned.

Investments are reported at fair value. Fair value is the amount reasonably expected to be received for an investment in a current sale between a willing buyer and a willing seller. Securities traded on a national or international exchange, including master limited partnerships, are valued at the last reported sales price at the then current exchange rates. Mortgages are valued on the basis of future principal payments discounted at prevailing interest rates for similar instruments. The fair value of real estate and timber are based on independent appraisals and internal valuations. Investments that do not have an established market are reported at estimated fair value received from the investment managers. The value of OP&F's private equity interests are based on values established by each partnership's valuation committee. Investments, for which no national exchanges or pricing services exist, such as private equity assets, are valued at fair value by the investment partnership based on the valuation methodology outlined in the partnership agreement. Real estate may be valued by the manager or independent appraisers. Commingled assets that are not traded on a national exchange are valued by the commingled manager. OP&F performs due diligence reviews of the investment pricing, process and infrastructure of private equity, commingled and real estate investments to assure that asset values provided by the managers are reasonable.

Net appreciation (depreciation) is determined by calculating the change in the fair value of investments between the end of the year and the beginning of the year, less the cost of investments purchased, plus reinvested proceeds from sales of investments at fair value. Investment expense consists of administrative expenses directly related to OP&F's investment operations and a proportional amount of all other administrative expenses allocated based on the ratio of OP&F's investment staff to total OP&F staff.

### FEDERAL INCOME TAX STATUS

OP&F was determined to be a qualified trust under section 401(a) of the Internal Revenue Code that is exempt from Federal income taxes under Section 501(a) of the Internal Revenue Service Code. OP&F's DROP plan was also determined to be part of the 401(a) trust. A separate health care trust accrual

account is maintained for health care benefits under Internal Revenue Service (IRS) Code Section 115 trust. An IRS Code Section 401(h) account is maintained for Medicare Part B reimbursements.

### ADMINISTRATIVE COSTS

The cost of administering the plan is financed by investment income.

useful lives of the related assets. The range of estimated useful lives is as follows:

Buildings and Improvements:	40 years
Furniture and Equipment:	3 to 10 years
Computer Software and Hardware:	2 to 7 years

### CONTRIBUTIONS, BENEFITS AND REFUNDS

Employer and member contributions are recognized when due or in the period the related member salaries are earned. Benefits and refunds are recognized when due and payable in accordance with the terms of the plan.

### PROPERTY AND EQUIPMENT

Property and equipment are recorded at cost. Depreciation is computed using the straight-line method over the estimated

### CHANGES IN CAPITAL ASSETS\*

Non-Depreciable Capital Assets	Jan. 1, 2019	Additions	Disposals	Dec. 31, 2019
Land	\$3,200,000	\$-	\$-	\$3,200,000
<b>Depreciable Capital Assets</b>				
Building and Improvements	\$21,395,605	\$-	\$-	\$21,395,605
Furniture and Equipment	3,350,889	81,865	(11,375)	3,421,379
Computer Software and Hardware	16,853,486	918,705	(26,971)	17,745,220
<b>TOTAL DEPRECIABLE CAPITAL ASSETS</b>	<b>41,599,980</b>	<b>1,000,570</b>	<b>(38,346)</b>	<b>42,562,204</b>
<b>Accumulated Depreciation</b>				
Building and Improvements	10,350,024	526,279	-	10,876,303
Furniture and Equipment	3,025,249	219,286	(11,375)	3,233,160
Computer Software and Hardware	16,044,489	358,073	(26,971)	16,375,591
<b>TOTAL ACCUMULATED DEPRECIATION</b>	<b>29,419,762</b>	<b>1,103,638</b>	<b>(38,346)</b>	<b>30,485,054</b>
<b>TOTAL DEPRECIABLE CAPITAL ASSETS, NET</b>	<b>\$12,180,218</b>	<b>\$(103,068)</b>	<b>\$-</b>	<b>\$12,077,150</b>

\* Additions in capital assets are related to purchases of property and equipment in 2019. Increases in accumulated depreciation are a result of depreciation expensed over the useful life of the asset which was expensed in 2019. Decreases in both the capital assets and accumulated depreciation are related to the disposal of property and equipment in 2019.

## 2. DESCRIPTION OF THE SYSTEM

### ORGANIZATION

OP&F is a cost-sharing, multiple-employer public employee retirement system established by the ORC Chapter 742 in 1965 to consolidate the various individual local police and firefighter's relief and pension funds into one statewide plan. OP&F is administered by a nine member Board of Trustees, consisting of two active representatives of police departments, two active representatives of fire departments, one retired police officer and one retired firefighter. The Board of Trustees also includes three statutory members. Each statutory member—one appointed by the Governor of Ohio, one by the Ohio Treasurer of State and one appointed jointly by the Ohio Senate President and Ohio Speaker of the House of Representatives—must have professional investment expertise.

OP&F administers pension, disability, DROP and health care stipend benefits to qualified members. In addition, OP&F administers survivor benefits, death benefits and a health care stipend benefit for eligible survivors, spouses, children and dependent parents. OP&F is a separate financial reporting entity in accordance with criteria established by Governmental Accounting Standards Board Statement No.14, because OP&F is a legally separate entity, a voting majority of the governing board is not appointed by the State and it is fiscally independent of other state and local governments. OP&F also has a variety of professional consultants and money managers as listed on pages vii and 77.

### PLAN MEMBERSHIP

Employer and member data as of Jan. 1, 2019, based on the most recent actuarial valuation, is as follows:

Employee Members	2019		Total
	Police	Fire	
<b>Retirees and Beneficiaries</b>			
Currently receiving benefits	16,923	12,643	29,566
Terminated employees entitled to benefits but not yet receiving them	148	78	226
<b>TOTAL BENEFIT MEMBERS</b>	<b>17,071</b>	<b>12,721</b>	<b>29,792</b>
<b>Current Members</b>			
Vested*	7,459	6,894	14,353
Non-vested	8,171	6,563	14,734
<b>TOTAL CURRENT MEMBERS</b>	<b>15,630</b>	<b>13,457</b>	<b>29,087</b>
<b>TOTAL EMPLOYEE MEMBERS</b>	<b>32,701</b>	<b>26,178</b>	<b>58,879</b>
<b>Employer Members</b>			
Municipalities	248	201	449
Townships	-	170	170
Villages	278	37	315
<b>TOTAL EMPLOYER MEMBERS</b>	<b>526</b>	<b>408</b>	<b>934</b>

\* Includes Rehired Retirees.

### BENEFITS

Plan benefits are established under ORC Chapter 742. 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 allowable 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.

**BENEFIT**

An annual pension equal to a percentage of the allowable average annual salary. The percentage equals 2.5% for each of the first 20 years of service credit, 2% for each of the next five years of service credit and 1.5% for each year of service credit in excess of 25 years. The maximum pension of 72% of the allowable average annual salary is paid after 33 years of service credit.

**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 have elapsed from the date of their full-time hire.

**BENEFIT**

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

**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 the Normal Service Retirement benefit (up to 25 years of service credit).

**ACTUARIALLY REDUCED****ELIGIBILITY**

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

**BENEFIT**

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

**OTHER BENEFITS**

In addition to retirement benefits, OP&F also provides disability, survivor and Death Benefit Fund (DBF) benefits. Disability benefits are available to all members and vary by length of service and type of disability. Statutory survivor benefits are specified dollar amounts paid to eligible surviving spouse, children and dependent parents upon the death of an active member or retiree. A one-time lump sum death benefit of \$1,000 is payable to the surviving spouse, designated beneficiary or estate, as applicable, of each deceased retired member.

OP&F also administers the Ohio Public Safety Officers DBF, which 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. If the public safety officer had not qualified for age and service retirement these eligible survivors are entitled to receive the member's full base pay until the officer would have been eligible to retire as of the maximum age and service pension for the officer's position, which will be reduced at the member's maximum pension eligibility date. If the public safety officer would have qualified for maximum age and service retirement, the survivors are eligible for a transitional benefit equal to 75% of the monthly base pay. The transitional benefit is paid in addition to any other payments that they might be eligible to receive without offset.

**DEFERRED RETIREMENT OPTION PLAN**

Effective January 2003, DROP is an optional benefit that allows eligible police officers and firefighters to accumulate a lump sum of money for retirement, subject to the member meeting certain criteria.

At Dec. 31, 2019, 4,357 members were enrolled in the DROP program, with total values of the DROP accounts equaling \$1,715.0 million.

**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, a portion of their ongoing OP&F employee contributions and interest, accumulates tax-deferred at OP&F on their behalf. 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 Treasury Note Business Day Series, as published by the U.S. Department of the Treasury, with a cap of 5%. This variable interest rate is adjusted quarterly to match the published 10-year U.S. Treasury Note Business Day Series rate for the last trading business day of the preceding quarter and is in effect for the subsequent quarter. As of Jan. 1 2020, OP&F's Board of Trustees approved a DROP interest floor of 2.5%.

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 qualifies them for a cost-of-living allowance during DROP will receive 3% of their base pension.

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 years.

- 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 the 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 DROP minimum participation period. The member's surviving spouse, designated beneficiary or estate, as applicable, will receive the entire DROP account balance determined at 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 and salary 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 the 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 DROP minimum participation period. The member's surviving spouse, designated beneficiary or estate, as applicable, will receive the entire DROP account balance determined at 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 and salary earned during the DROP participation period.

All DROP members retiring before the eight-year maximum participation period will 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, as applicable, 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% 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 between receiving a disability benefit or DROP and a service retirement benefit. If the member stays in DROP, the disability benefit is forfeited. 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.

## REFUNDS

Upon termination of active service in a police or fire department, members may withdraw their accumulated employee contributions on deposit with OP&F. Acceptance of a refund of employee contributions cancels the member's rights, benefits and total service with OP&F. Employer contributions to OP&F are not refundable.

## HEALTH CARE

On Jan. 1, 2019, OP&F changed the way it supports retiree health care. A stipend-based health care model has replaced the self-insured group health care plan that had been in place. OP&F has contracted with a vendor who can assist eligible retirees in choosing health care plans that are available where they live (both Medicare-eligible and pre-65 populations). A stipend funded by OP&F is available to these members through a Health Reimbursement Arrangement and can be used to reimburse retirees for qualified health care expenses. As a result of this change, it is expected that the solvency of the HCSF will be extended allowing OP&F to provide stipends to eligible participants.

Under Ohio law, health care costs paid from the funds of the plan are included in the employer contribution rates, which are currently 19.5% and 24% of salaries for police and fire employers, respectively. During 2019, the Board of Trustees has allocated employer contributions equal to 0.5% of annual covered payroll to the Health Care Stabilization Fund (HCSF). The HCSF is part of the Pension Reserve Fund.

OP&F maintains funds for health care in two separate accounts: one account for health care benefits and one account for Medicare Part B reimbursements. A separate health care trust accrual account is maintained for health care benefits under IRS Code Section 115 trust. IRS Code Section 401(h) account is maintained for Medicare Part B reimbursements.

### 3. CONTRIBUTIONS AND RESERVES

#### CONTRIBUTIONS

The ORC Chapter 742 requires contributions by active members and their employers. Contribution rates are subject to annual review by the Ohio Retirement Study Council (ORSC). Additionally, an actuary is used to determine the actuarial implications of the requirement. The adequacy of contribution rates is determined annually using the entry age normal actuarial cost method. Rates are at the statutory maximums and the maximum rates have been taken into consideration in the projection of pension benefits for financial accounting measurement purposes.

Rates established by the ORC Jan. 1, 2019 through Dec. 31, 2019:

Percentage of active member payroll	Police	Fire	Percent Contributed
Member	12.25%	12.25%	100%
Employer	19.50%	24.00%	100%
<b>TOTAL STATUTORY RATE *</b>	<b>31.75%</b>	<b>36.25%</b>	<b>100%</b>

\* Combined member and employer contributions as a percentage of the total active member payroll required and made Jan. 1, 2019 through Dec. 31, 2019.

The ORC establishes the length of the amortization period for unfunded pension liability as the primary measure of OP&F's financial status, with a period of 30 years or less being considered satisfactory. This 30-year target was to be attained by Dec. 31, 2006 and maintained thereafter. As of Jan. 1, 2019, the amortization period was 29 years.

In accordance with the ORC, the State of Ohio is required to contribute additional amounts to finance the cost of certain state-legislated benefit improvements. The total amount contributed by the State of Ohio was \$260,488 for the year ended Dec. 31, 2019.

The chart below summarizes the member and employer contributions for 2019:

#### SUMMARY OF MEMBER AND EMPLOYER CONTRIBUTIONS

Year Ending Dec. 31	Police Member Contributions	Police Employer Contributions	Percent Contributed	Fire Member Contributions	Fire Employer Contributions	Percent Contributed
2019	\$163,411,272	\$243,539,819	100%	\$140,002,410	\$270,476,607	100%

#### LOCAL FUNDS RECEIVABLE

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%, compounded semi-annually. Local governments began repayment in 1969 and payments are required to be made until 2035.

The following is a summary of the amounts due on the local funds receivable:

Year ending December 2020	\$1,684,199
Year ending December 2021	1,681,058
Year ending December 2022	1,681,058
Year ending December 2023	1,681,058
Year ending December 2024	1,681,058
Thereafter	17,466,022
<b>TOTAL PROJECTED PAYMENTS</b>	<b>25,874,453</b>
Less future interest portion	(6,931,850)
<b>BALANCE AT DEC. 31, 2019*</b>	<b>\$18,942,603</b>

\* The Local Funds Receivable balance due at Dec. 31, 2019 includes \$22,094 due from two employers, which had previously underpaid their semi-annual payment.

## RESERVES

The ORC requires that several reserve funds be maintained annually for tracking fund activities for both police and fire. Each year-end the reserve funds are managed and allocations are done to reflect the revenue and expense activities and funding balance transfers due to changes in membership status from active to retired.

The Guarantee Fund and Expense Fund are always zero at the end of each year as they are used to fund the Pension Reserve Fund from investment gains and losses and to account for the administrative operation expenses.

As required by the ORC, the following accounts have been established for the reserves held for current and future benefits and are separated between police and fire:

### *The Police Officers' and Firefighters' Contribution Fund*

This fund accumulates the contributions deducted from the salaries of members. Upon retirement, a member's accumulated contributions are transferred to the Police Officers' or Firefighters' Pension Reserve Fund.

### *The Police Officers' and Firefighters' Employers' Contribution Fund*

This fund is the depository for employer contributions. Based on actuarial valuations, amounts are transferred from this account to the Police Officers' and Firefighters' Pension Reserve Fund.

### *The Police Officers' and Firefighters' Pension Reserve Fund*

This fund is the account from which all retirement, disability, DROP, health care stipend and survivor benefits are paid. Included in this Fund is the Health Care Stabilization Fund from which payments for the health care benefits are made. Amounts are transferred into the Pension Reserve Fund from the Contribution Funds and the Guarantee Fund.

### *The Guarantee Fund*

This fund records all investment earnings of OP&F. In addition, contributions from the State of Ohio, exclusive of death benefit contributions, are recorded in this fund. Annually, investment earnings are transferred to the Pension Reserve Fund and the Expense Fund, as defined below.

Ohio law provides that any deficit occurring in any other fund that will not be covered by payments to that fund, as otherwise provided by sections 742.01 to 742.61 of the ORC, must be paid by transfers of amounts from the Guarantee Fund to such fund or funds. Should the amount in the Guarantee Fund be insufficient at any time to meet the amounts payable therefrom, the amount of such deficiency, with regular interest,

must be paid by an additional employer rate of current contributions as determined by the actuary and must be approved by the Board of Trustees of OP&F and the amount of such additional employer contribution will be credited to the Guarantee Fund.

### *The Expense Fund*

This fund is used to record all expenses for the administration and management of OP&F. Annually funds are transferred from the Guarantee Fund to cover expenses incurred.

Fiduciary net position held in trust for benefits for the various funds were as follows:

	2019
Members' Contribution	\$3,150,335,470
Employers' Contribution	883,273,334
Pension Reserve	12,481,671,000
<b>TOTAL</b>	<b>\$16,515,279,804</b>

## 4. FAIR VALUE MEASUREMENT

OP&F measures and records its investments using fair value measurement guidelines established by the generally accepted accounting principles. These guidelines categorize the inputs to valuation techniques into three hierarchical levels, as follows:

**Level 1:** Quoted (unadjusted) prices for identical investments in active markets.

**Level 2:** Inputs other than quoted prices that are observable for the investments directly or indirectly. These inputs are quoted prices for similar assets in active markets, quoted prices for identical or similar assets in markets that are not active and observable inputs other than quoted prices. Such inputs may include interest rates, yield curves, implied volatilities and credit spreads.

**Level 3:** Level 3 inputs are prices based on unobservable sources. These inputs include the best information available under the circumstances, which can include OP&F's own data and takes into account all information about market participant assumptions.

The classification of the levels, within the hierarchy, is based on the asset type and the pricing transparency. Level 1 assets are valued based on prices quoted by external pricing vendors furnished to OP&F's custodial banks.

Level 2 securities in Cash and Short-Term Investments primarily consist of Commercial paper which are reported at cost plus earned discount and approximates market or fair value. Equity securities in Level 2 are valued using bid evaluation while fair values for debt and derivative securities in Level 2 are based on bid evaluations or matrix pricing method. Bid evaluations are typically based on market quotations, yields, maturities, call features and ratings. The matrix pricing technique is used to value securities based on the securities relationship to benchmark quoted prices.

The Level 3 Real Assets securities consist solely of investments in timberlands. Due to the significance of certain unobservable assumptions in the valuation of timberland this investment is valued using Income Capitalization, Sales Comparison or Cost methods. The Income Capitalization method involves using a range of discount rates to determine the present value of the future income that can be produced over the holding period. The sales comparison approach is a method of estimating the fair value based on open market prices recently paid for similar timberland properties in the market area. The cost approach is a method of estimating the fair value based on the concept that a market participant would pay no more for the real asset property than the cost to purchase and develop a comparable property having utility.

The fair value of investments in certain equity, fixed income and marketable alternative funds are based on the investments' net asset value. Investments that are measured at fair value using the net asset value as practical expedient are not classified in the fair value hierarchy.

The following table shows the classification of OP&F fair value measurement for its investments as of Dec. 31, 2019 (Dollars in thousands):

	Dec. 31, 2019	Fair Value Measurements Using:		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Investments by fair value level</b>				
Corporate Bonds and Obligations	\$1,921,929	\$-	\$1,913,873	\$8,056
Domestic Equities	861,256	759,036	102,220	-
International Equities	1,776,250	1,775,398	852	-
Master Limited Partnerships	587,559	587,559	-	-
Non-Agency Mortgage and Asset-Backed Securities	254,262	-	254,262	-
Municipal Bond Obligations	5,983	-	5,983	-
International Bonds	25,134	-	25,134	-
Real Assets	97,807	-	-	97,807
U.S. Agency Mortgage and Asset-Backed Securities	292,277	-	292,277	-
U.S. Government Treasury Obligations	138,110	-	138,110	-
U.S. Government Treasury STRIPS*	5,407	-	5,407	-
<b>TOTAL INVESTMENTS BY FAIR VALUE LEVEL</b>	<b>\$5,965,974</b>	<b>\$3,121,993</b>	<b>\$2,738,118</b>	<b>\$105,863</b>
<b>Investments measured at Net Asset Value (NAV)</b>				
Commercial Mortgages	\$36,198			
Domestic Commingled Bonds	1,162,496			
Domestic Pooled Equities	1,425,148			
Domestic Equities	1,330,124			
International Equities	1,291,054			
Non-Agency Mortgage and Asset-Backed Securities	9,506			
Private Debt	593,814			
Private Equity	1,418,364			
Real Assets	391,501			
Real Estate	1,812,656			
<b>TOTAL INVESTMENTS MEASURED AT NAV</b>	<b>\$9,470,861</b>			
<b>Investment Derivatives</b>				
Futures	\$-	\$-	\$-	\$-
Options/Swaptions	(113)	-	(113)	-
Foreign Currency Forwards	(845)	-	(845)	-
Credit Default Swap - International	(48)	-	(48)	-
Credit Default Swaps-Domestic	64	-	64	-
Interest Rate Swap - International	(90)	-	(90)	-
Interest Rate Swaps - Domestic	(2,028)	-	(2,028)	-
<b>TOTAL INVESTMENT DERIVATIVES</b>	<b>\$(3,060)</b>	<b>\$-</b>	<b>\$(3,060)</b>	<b>\$-</b>
<b>TOTAL INVESTMENTS</b>	<b>\$15,433,775</b>			
<b>Securities not leveled in investment portfolio</b>				
<b>Cash Equivalents</b>	<b>\$1,123,042</b>			

\* Separate Trading of Registered Interest and Principal Securities (STRIPS).

**INVESTMENTS MEASURED AT THE NET ASSET VALUE (DOLLARS IN THOUSANDS)**

	Dec. 31, 2019	Unfunded Commitments <sup>(1)</sup>	Redemption Frequency (If Currently Eligible)	Redemption Notice Period <sup>(2)</sup>
Bond/Credit Funds <sup>(3)</sup>	\$1,684,004	\$118,975	Daily, Semi-annually, Not Eligible	0 Days - Not Eligible
Domestic Equity Funds <sup>(4)</sup>	732,740	-	Daily	0 Days
Exchange Traded Funds <sup>(5)</sup>	501,035	-	Daily	0 Days
Hedge Funds <sup>(6)</sup>				
<i>Global Macro</i>	776,019	-	Monthly	5-90 Days
<i>Credit</i>	39,362	-	Quarterly	60 Days
Hedge Fund of Funds <sup>(7)</sup>				
<i>Multi-Strategy</i>	823,504	-	Daily	5 Days
<i>Market Neutral</i>	622	-	Daily	0 Days
International Equity Funds <sup>(8)</sup>	1,291,054	-	Daily, Bi-monthly	0-9 Days
Private Equity/Venture Capital Funds <sup>(9)</sup>	1,418,364	564,568	Not Eligible	Not Eligible
Real Estate Funds				
<i>Open-End</i> <sup>(10)</sup>	1,275,939	50,000	Quarterly	30-90 Days
<i>Closed-End</i> <sup>(11)</sup>	536,717	218,546	Not Eligible	Not Eligible
Real Assets Funds				
<i>Open-End</i> <sup>(12)</sup>	183,924	0	Quarterly	90 Days
<i>Closed-End</i> <sup>(13)</sup>	207,577	184,739	Not Eligible	Not Eligible
<b>TOTAL INVESTMENTS MEASURED AT THE NAV</b>	<b>\$9,470,861</b>			

(1) Unfunded Commitments do not include distributions subject to recall.

(2) Days = Business or Calendar Days.

(3) **Bond/Credit Funds:** Nine credit/bond funds, ten private debt funds and one commercial mortgage fund are considered bond/credit funds. Each is valued at the net asset value at the end of the period based on the value of the underlying assets. Distributions from the private debt funds are received when the underlying assets are liquidated. This is estimated to occur between from five to eight years. For the investment footnoted, Ohio Police & Fire Pension Fund is currently subject to certain lock-up periods in terms of redemption.

(4) **Domestic Equity Fund:** Consists of one fund, which tracks the Russell 1000 Index. It is valued at net asset value on a daily basis. The fund is eligible for redemption on a daily basis.

(5) **Exchange Traded Funds:** Consisting of the SPDR S&P 500 ETF Trust which is an exchange-traded fund incorporated in the U.S. It tracks the S&P 500 Index. The trust consists of a portfolio representing all stocks in the S&P 500 Index. The ETF is structured as a Unit Investment Trust and is valued at the net asset value on a daily basis.

(6) **Hedge Funds:** Three Global Macro and one Credit fund. These funds can be redeemed monthly to quarterly basis with five to ninety days' notice.

(7) **Hedge Fund of Funds:** Consisting of one multi strategy and one market neutral fund. The multi strategy fund can be redeemed daily with five days' notice while the market neutral fund can be redeemed daily with zero days' notice.

(8) **International Equity Funds:** Consisting of three commingled funds which invest in international developed and emerging markets equity securities. These investments are valued at net asset value on a daily basis. These funds are eligible for redemption on a daily to bi-monthly basis with zero to nine days' notice.

(9) **Private Equity/Venture Capital Funds:** Consisting of 105 commingled funds, fund-of-funds, and secondary funds involving domestic, international and global buyout, distressed debt, special situations, growth equity and venture capital funds. These are long-term lock-up vehicles, typically with 10-year terms plus available extensions. These investments are valued at net asset value, typically on a quarterly basis, as reported by the fund. The unfunded commitments can be called to make new investments or pay fees and expenses. Distributions are received when underlying assets are liquidated and this occurs from five to 15 years.

(10) **Open-End Real Estate Funds:** Consisting of 13 commingled funds which invest primarily in operating and substantially leased institutional quality properties located in the U.S. These investments are valued at net asset value, typically on a quarterly basis, as reported by the fund. The unfunded commitments can be called to make new investments or pay fees and expenses. These funds are eligible for redemption on a quarterly basis subject to available liquidity with thirty to ninety days' notice. In two of the investments as footnoted, Ohio Police & Fire Pension Fund is currently subject to certain lock-up periods.

(11) **Closed-End Real Estate Funds:** Consisting of 37 commingled funds which invest in properties on a global basis having more risk and correspondingly higher expected returns than those in the Open-End Real Estate Funds. These are long-term lock-up vehicles, typically with 10-year terms plus available extensions. These investments are valued at net asset value, typically on a quarterly basis, as reported by the fund. The unfunded commitments can be called to make new investments or pay fees and expenses.

(12) **Open-End Real Assets Funds:** Consisting of one commingled fund which invests primarily in a diversified portfolio of infrastructure assets on a global basis. These investments are valued at net asset value, typically on a quarterly basis, as reported by the fund. The unfunded commitments can be called to make new investments or pay fees and expenses. These funds are eligible for redemption on a quarterly basis subject to available liquidity with ninety days' notice.

(13) **Closed-End Real Assets Funds:** Consisting of seven commingled funds which invest either in timberland markets, agriculture or infrastructure assets on a global basis. These are long-term lock-up vehicles, typically with 10-year terms plus available extensions. These investments are valued at net asset value, typically on a quarterly basis, as reported by the fund. The unfunded commitments can be called to make new investments or pay fees and expenses. These funds are not eligible for redemption and distributions are received when underlying assets are liquidated and this occurs from five to 15 years.

## 5. CASH AND INVESTMENTS

A summary of cash and short-term securities and investments held at Dec. 31, 2019 is as follows:

Category	2019 Fair Value
Cash and Cash Equivalent*	\$1,123,041,534
U.S. Government Treasury Obligations	138,109,809
U.S. Government Treasury STRIPS**	5,407,375
U.S. Agency Mortgage and Asset-Backed Securities	292,277,303
Non-Agency Mortgage and Asset-Backed Securities	263,767,973
Municipal Bond Obligations	5,982,870
Corporate Bonds and Obligations	1,921,928,853
Domestic Commingled Bonds	1,162,495,810
International Bonds	25,134,216
Domestic Equities	2,191,380,180
Domestic Pooled Equities	1,425,147,577
International Equities	3,067,303,781
Real Estate	1,812,655,901
Domestic and International Derivatives	(3,059,999)
Commercial Mortgage Funds	36,197,953
Private Equity	1,418,364,017
Private Debt	593,814,395
Real Assets	489,307,759
Master Limited Partnerships	587,559,232
<b>GRAND TOTAL</b>	<b>\$16,556,816,539</b>

The investment type classification is based on the characteristics of the individual securities.

\*Cash and cash equivalents are included in cash and short-term investments on the Statement of Fiduciary Net Position.

\*\* STRIPS = Separate Trading of Registered Interest and Principal Securities.

### MONEY WEIGHTED RETURN ON INVESTMENT

The money weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested. For the year ended Dec. 31, 2019, the annual money weighted rate of return on investments, net of investment expense was 17.279%.

### CUSTODIAL CREDIT RISK

The custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, an organization will not be able to recover deposits or will not be able to recover collateral securities that are in the possession of an outside party. The custodial credit risk for investments is the risk that, in the failure of the counterparty to a transaction, an organization will not be able to recover the value of investment or collateral securities that are in the possession of an outside party.

demand deposit and securities lending account not covered by federal deposit insurance be collateralized with securities permitted under ORC 135.18 at 102% of the value of the cash. Collateral is held in the Ohio Treasurer of State's name by a third party trustee for the benefit of OP&F. All of OP&F's depository-eligible securities are held in the custodial bank or its agent's nominee, for the benefit of OP&F. Any physical securities are held in the vaults of the custodial bank, or its agent. The custodial bank provides book entry accounting for OP&F's real estate and private market assets. The custody agreement between the custodial bank and the Ohio Treasurer of State has historically restricted the right of the custodial bank or its agents from putting any right, charge, security interest, lien or claim of any kind on the securities they hold. Despite OP&F objections, the Ohio Treasurer of State allowed language in the custody agreement that grants a security interest in OP&F assets. The cash held in foreign local banks for immediate settlement of pending trade transactions is not collateralized.

In accordance with ORC 135.18, the Ohio Treasurer of State, the statutory custodian for OP&F, requires that the amount in any

## DEPOSITS EXPOSED TO CUSTODIAL CREDIT RISK AS OF DEC. 31, 2019

	2019
Uninsured deposits collateralized with securities held by the pledging financial institution	\$8,577,805
Uninsured and uncollateralized deposits	\$2,354,363

- Corporate bonds consist of debt instruments issued by domestic corporations or U.S. dollar-denominated debt issued by foreign entities and managed by a U.S. based investment manager.

### CREDIT RISK

Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation to the holder of the investment. This risk is measured by the assignment of a rating by a nationally recognized statistical rating organization. OP&F's risk management policy over credit risk is based on the type of fixed income instruments. For credit risk purposes, OP&F classifies its fixed income securities into four main types: core, high yield, private credit and short-term fixed income. The credit risk policies related to these types are as follows:

### CORE FIXED INCOME

OP&F's four core fixed income portfolios, all managed externally, contain government, mortgage and asset-backed securities, U.S. Agency and corporate bonds. These external managers invest in securities based on guidelines provided by the OP&F Board of Trustees. It is the policy of OP&F that a security in the core fixed income portfolio shall be rated BBB- or better by two standard rating services at the time of purchase. OP&F allows some of its investment managers to purchase securities that are "not rated" as long as they deem these securities to be at least equivalent to the minimum ratings at the time of purchase.

- Government instruments include those issued by the U.S. Treasury as well as fixed income instruments, other than mortgage-backed securities, of an agency or instrumentality of the U.S. government.
- Agency mortgage-backed instruments include collateralized mortgage obligations and Real Estate Mortgage Investment Conduits (REMIC's), whose payment of principal and interest is insured by the full faith and credit of the U.S. government, or an agency or instrumentality thereof. Also included in this category are secured assets issued by Government National Mortgage Association (GNMA) project loans, pools and participation certificates, Federal National Mortgage Association (FNMA) and Federal Home Loan Mortgage Corporation (FHLMC).
- Non-agency mortgage and asset-backed instruments refer to mortgage and asset-backed securities that are made up of mortgage loans not guaranteed by U.S. government supported agency.

The following tables show ratings by asset class in OP&F's fixed income portfolio as of Dec. 31, 2019:

### RATINGS BY ASSET CLASS – 2019

S&P Ratings	Corporate Bonds and Obligations	Domestic Commingled Bonds	Municipal Bond Obligations	International Bonds	U.S. Government Treasury Obligations	U.S. Government Treasury STRIPS	U.S. Agency Mortgage and Asset-Backed Securities	Non-Agency Mortgage and Asset-Backed Securities	GRAND TOTAL
AAA	\$2,422,147	\$-	\$-	\$8,132,052	\$-	\$-	\$622,391	\$85,914,909	\$97,091,499
AA+	1,428,487	1,022,402,423	101,257	-	138,109,809	5,407,375	288,082,396	4,018,946	1,459,550,693
AA	7,595,915	-	1,888,087	-	-	-	-	6,358,696	15,842,698
AA-	34,642,944	70,873,153	1,213,378	-	-	-	-	375,391	107,104,866
A+	49,012,394	-	832,463	-	-	-	546,049	9,506,283	59,897,189
A	42,709,290	-	249,130	-	-	-	-	3,991,531	46,949,951
A-	73,795,308	-	218,527	6,013,352	-	-	-	301,196	80,328,383
BBB+	89,518,703	-	21,519	2,639,021	-	-	140,564	2,218,394	94,538,201
BBB	60,856,057	69,220,234	-	1,065,363	-	-	-	879,874	132,021,528
BBB-	236,219,252	-	1,397,594	3,469,086	-	-	-	-	241,085,932
BB+	212,358,170	-	-	477,257	-	-	-	1,569,302	214,404,729
BB	276,318,485	-	-	136,413	-	-	-	-	276,454,898
BB-	260,322,420	-	-	1,150,268	-	-	-	3,524,631	264,997,319
B+	200,420,567	-	-	1,155,954	-	-	-	-	201,576,521
B	146,094,187	-	-	177,897	-	-	-	1,146,813	147,418,897
B-	112,806,485	-	-	7,482	-	-	-	1,648,123	114,462,090
CCC+	51,140,372	-	-	53,295	-	-	-	2,490,182	53,683,849
CCC	7,176,788	-	-	5,331	-	-	-	11,314,400	18,496,519
CCC-	1,229,510	-	60,915	508,323	-	-	-	2,354,749	4,153,497
CC	283,750	-	-	-	-	-	578,594	7,168,809	8,031,153
C	-	-	-	-	-	-	-	311,126	311,126
D	1,515,450	-	-	-	-	-	-	6,029,950	7,545,400
NR*	54,062,172	-	-	143,122	-	-	2,307,309	112,644,668	169,157,271
<b>GRAND TOTAL</b>	<b>\$1,921,928,853</b>	<b>\$1,162,495,810</b>	<b>\$5,982,870</b>	<b>\$25,134,216</b>	<b>\$138,109,809</b>	<b>\$5,407,375</b>	<b>\$292,277,303</b>	<b>\$263,767,973</b>	<b>\$3,815,104,209</b>

\*NR = Not Rated.

### HIGH YIELD FIXED INCOME

As of Dec. 31, 2019, OP&F had four high yield fixed-income portfolios that invest in publicly traded securities. All these portfolios were managed externally. The high yield bond asset class consists of the portion of the U.S. corporate bond market that is rated below BBB- by Standard & Poor's 500 (S&P) or below Baa3 by Moody's. Accordingly, credit risks associated with these bonds are greater than with core fixed income bonds. OP&F's policy is to invest in high yield bonds issued by U.S. corporations with a minimum credit rating of CCC or equivalent. OP&F allows some of its investment managers to purchase securities that are "not rated" as long as they deem these securities to be at least equivalent to the minimum ratings at the time of purchase. It is possible after purchase that the security is downgraded. In the event of an investment guideline violation and in the event of a security downgrade, such that the ratings (Moody's, S&P, or Fitch Investor's Service) are below the allowable minimum security quality, the investment manager will inform OP&F in writing within five business days of such violation. Such notice will include the action the manager intends to take with regard to the violation and over what time period that action will be taken. Both the method and timing of the violation resolution must be agreeable to OP&F.

### PRIVATE CREDIT

As of Dec. 31, 2019, OP&F had seven private credit strategies with six portfolio managers of which each is invested in a pooled fund. These pooled funds predominantly are not publicly listed and as such do not have specific rating. However, most of OP&F's private credit securities range from the equivalent of B to BB+ in terms of comparable S&P credit rating.

### SHORT-TERM INVESTMENTS

The short-term investment portfolio consists mainly of commercial paper. OP&F's policy is that, at the time of purchase, the short-term instrument must be rated within the two highest classifications established by two standard rating services. However, it is possible that after the purchase the ratings could change. The following table lists the commercial paper ratings as of Dec. 31, 2019:

S&P/Moody's Rating	Fair Value 2019	Percent 2019
A1/P1	\$243,612,718	48.12%
A1/P2	101,609,635	20.07%
A2/P1	24,997,544	4.94%
A2/P2	135,997,017	26.87%
<b>GRAND TOTAL</b>	<b>\$506,216,914</b>	<b>100.00%</b>

## INTEREST RATE RISK

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of fixed income investments. This relationship can be measured using duration, which shows the sensitivity of the price of a fixed-income investment to a change in interest rates. OP&F uses effective duration to measure the interest rate risk of the core fixed income portfolio. The effective duration takes into account that expected cash flows will fluctuate as interest rates change.

All the core fixed income managers are also required to monitor and report the effective duration of their portfolio(s) on a monthly basis. As of Dec. 31, 2019, the permissible ranges for the four core fixed income portfolio managers were:

Portfolio Benchmark	2019 Benchmark Duration (years)	Portfolio Manager	Portfolio Permissible Range
Bloomberg Barclays Aggregate Bond Index	5.87	PIMCO Total Return Bond *	Benchmark +/- 2 years
3 Month LIBOR	0.25	PIMCO Dynamic Bond *	-3 years to + 8 years (Absolute)
2:1 Leveraged Barclays U.S. Government Inflation Linked Bond Index	15.87	Bridgewater Associates**	Replicate benchmark
Bloomberg Barclays Aggregate Bond Index	5.87	PGIM Core Bond	Benchmark +/- 2 years
Bloomberg Barclays Aggregate Bond Index	5.87	Loomis Core Bond	Benchmark +/- 2 years

\*Pacific Investment Management Company (PIMCO) is considered as one manager with two accounts; both are benchmarked against two times the Index.

\*\*Bridgewater Associates holds a 2:1 levered portfolio.

Since portfolio level duration is the best measure of interest rate risk, OP&F does not require its managers to measure or report on the duration of each security sector. OP&F does not measure the duration of their high yield portfolios because interest rate risk is a very small part of the total risk of high yield securities. The major risks for high yield bonds are credit risk and interest rate spread risk.

The following table lists the effective duration for OP&F's fixed-income portfolio as of Dec. 31, 2019:

<b>Investment Type</b>	<b>Fair Value 2019</b>	<b>Effective Duration (years)</b>
U.S. Government Treasury Obligations	\$138,109,809	4.31
U.S. Government Treasury STRIPS	5,407,375	13.90
U.S. Agency Mortgage and Asset-Backed Securities	292,277,303	1.80
Non-Agency Mortgage and Asset-Backed Securities	263,767,973	1.97
Municipal Bond Obligations	5,982,870	9.66
Corporate Bonds and Obligations	1,921,928,853	2.10
International Bonds	25,134,216	0.05
Domestic Commingled Bonds	1,162,495,810	14.28
<b>TOTAL FIXED INCOME EFFECTIVE DURATION</b>	<b>\$3,815,104,209</b>	<b>5.88</b>

### COLLATERALIZED MORTGAGE OBLIGATIONS

In general, mortgage-backed securities entitle their holders to receive both principal and interest payments from the payments made by the borrowers of the underlying mortgages over the lives of those loans. The life of the mortgage that underlies a mortgage-backed security can be shortened by several economic events, including borrower refinancing. When interest rates fall and remain very low, a growing number of borrowers will refinance their existing loans causing mortgage-backed security holders to be repaid more quickly than anticipated. This early repayment is a form of market risk assumed by OP&F and other owners of mortgage-backed securities.

To the contrary, when interest rates begin to rise, the refinancing of existing mortgages begins to slow. If the rates remain high for long periods of time, fewer borrowers refinance their mortgages. This causes mortgage-backed security holders to be repaid over longer periods of time. This prolonged repayment is known as extension risk and is another form of market risk assumed by OP&F and other owners of mortgage-backed securities.

These securities are based on cash flows from interest payments on underlying loans. Therefore, they are sensitive to prepayments by the debtor, which may result from a decline in interest rates.

### VARIABLE RATE SECURITIES

OP&F's core fixed income and high yield managers are permitted to hold variable-rate coupons whose rates may vary directly or inversely with changes in a related interest rate. As of Dec. 31, 2019, OP&F did not hold any security with a variable-rate coupon that had a multiplier greater than one or any security with an inverse variable rate.

### CONCENTRATION OF CREDIT RISK

Concentration of credit risk is the risk of loss attributed to the magnitude of an entity's investment in a single issuer. OP&F does not permit more than 10% of the core fixed income portfolio to be invested in the securities of any one issuer, and no more than 5% in any one issue on a dollar duration basis, with the exception of U.S. Government or Agency securities. For the high yield portfolio, no more than 10% of the entire portfolio at market shall be invested in securities of a single issue or issuer, unless otherwise approved by the Board of Trustees. At Dec. 31, 2019, OP&F did not hold investments in any one issuer that represented 5% or more of OP&F's net assets.

### SECURITIES LENDING

OP&F participates in domestic and international securities lending programs, as authorized by the Board of Trustees. Securities are loaned to investment broker/dealers (borrower). Securities loaned are collateralized by the borrower at 102% of the domestic and 105% of the international loaned securities' fair value. OP&F has minimized its exposure to credit risk due to borrower default by having the lending agent bank determine daily that required collateral meets the specified collateral requirements. There are no restrictions on the amount of the securities that can be loaned. Contracts with lending agents require them to indemnify OP&F if the borrowers fail to return the securities or fail to pay OP&F for income distributions by the securities' issuer while the securities are on loan. All securities loans can be terminated on demand and the maturities of the investments made with an acceptable form of the collateral generally matches the maturities of the securities loans.

At year end, OP&F has no credit risk exposure to borrowers because the amounts that OP&F owes the borrowers exceed the amounts the borrowers owe OP&F.

OP&F has not experienced any losses due to credit or market risk on securities lending activity since implementation of the program. OP&F does have the ability to pledge or sell collateral securities in case of a borrower default. The following represents the balances relating to the securities lending transactions at Dec. 31, 2019:

**SECURITIES LENT AS OF DEC. 31, 2019**

<b>Securities Lent</b>	<b>Underlying Security</b>	<b>Collateral Received</b>	<b>Collateral Fair Value</b>	<b>Type of Collateral</b>
Domestic Corporate Fixed Income	\$132,770,310	\$136,768,517	\$136,768,517	Cash
Domestic Equities	87,414,227	90,051,548	90,051,548	Cash
U.S. Government and Treasuries	43,970,121	44,884,739	44,884,739	Cash
International Bonds	13,680,264	14,039,892	14,039,892	Cash
International Equities	71,157,769	73,762,218	73,762,218	Cash
<b>TOTAL SECURITIES LENT</b>	<b>\$348,992,691</b>	<b>\$359,506,914</b>	<b>\$359,506,914</b>	

**FOREIGN CURRENCY RISK**

Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment or a deposit. OP&F's target allocation to international equity holdings was 18.00% as of Dec. 31, 2019. While OP&F has no specific policy regarding the international custodial credit risk, cash for one international investment manager is limited to 5% or less of their total portfolio, cash for a second international manager

is limited to 7% and cash for a third manager is limited to 10%. Apart from cash needed for immediate settlement of pending trade transactions, (local cash awaiting repatriation), any excess cash received in OP&F's trust accounts is invested in a U.S. Dollar denominated Short-Term Investment Fund (STIF). For the year ending Dec. 31, 2019, OP&F's exposure to foreign currency risk is as follows:

**2019 EXPOSURE TO CURRENCY RISK**

Currency	Fair Value (Cash Deposits)	Fair Value (Fixed Income)	Fair Value (Currency Contracts)	Fair Value (Equities)	Fair Value (Private Equity and Real Estate)	Fair Value (Derivatives)	Total Fair Value (Cash Deposits and Securities)
Argentina Peso	35,178	708,548	-	-	-	-	743,726
Australian Dollar	19,838	448,095	(159,590)	6,688,977	-	(173,822)	6,823,498
Brazilian Real	10,252	-	76,548	23,871,828	6,518,785	-	30,477,413
British Pound	369,967	9,587,625	(254,917)	318,117,891	-	22,673	327,843,239
Canadian Dollar	96,848	-	(161,089)	52,278,240	-	23,998	52,237,997
China Offshore Yuan	60	-	(54,659)	5,557,024	-	-	5,502,425
Columbian Peso	-	-	47,250	-	-	-	47,250
Danish Kroner	6,300	-	(246)	13,453,642	-	-	13,459,696
Euro	1,518,619	8,376,591	(386,752)	422,938,460	211,553,176	(589,832)	643,410,262
Hong Kong Dollar	-	-	(10,217)	99,731,437	-	33,716	99,754,936
Indonesian Rupiah	-	-	-	2,007,489	-	-	2,007,489
Japanese Yen	131,654	-	76,400	162,897,967	1,651,630	9,253	164,766,904
Malaysian Ringgit	-	-	-	796,151	-	-	796,151
Mexican Peso	19,983	3,742,680	(8,191)	2,929,073	-	-	6,683,545
New Turkish Lira	439	-	-	2,300,595	-	-	2,301,034
New Zealand Dollar	3,512	-	-	-	-	-	3,512
Norwegian Krone	24	-	(417)	7,810,739	-	-	7,810,346
Peru New Sol	5,382	2,270,670	-	-	-	-	2,276,052
Philippine Peso	-	-	-	391,410	-	-	391,410
Polish Zloty	207	-	11,491	1,716,823	-	-	1,728,521
Qatari Riyal	-	-	-	509,429	-	-	509,429
Singapore Dollar	124,456	-	(16,404)	24,075,835	-	-	24,183,887
South African Rand	10,340	-	-	7,052,052	-	-	7,062,392
South Korean Won	-	-	-	37,584,626	-	-	37,584,626
Swedish Krona	265	-	4,474	73,900,241	-	(15,198)	73,889,782
Swiss Franc	1,041	-	-	101,853,013	-	-	101,854,054
Taiwanese New Dollar	-	-	(7,391)	27,552,106	-	-	27,544,715
Thai Baht	-	-	-	6,415,584	-	-	6,415,584
UAE Dirham	\$-	\$-	\$-	\$592,201	\$-	\$-	\$592,201
<b>GRAND TOTAL</b>	<b>\$2,354,365</b>	<b>\$25,134,209</b>	<b>\$(843,710)</b>	<b>\$1,403,022,833</b>	<b>\$219,723,591</b>	<b>\$(689,212)</b>	<b>\$1,648,702,076</b>

## DERIVATIVES

Derivatives are generally defined as investment instruments whose value depends on, or is derived from, the value of an underlying asset, reference rate, or index.

OP&F has classified the following as derivatives:

- **Mortgage and Asset-Backed Securities:** OP&F invested in Planned Amortization Class and Sequential Pay Real Estate Mortgage Investment Conduit bonds issued by GNMA, FHLMC, and FNMA. Planned Amortization Class bonds are retired according to a payment schedule so as to have a stable average life and yield even if expected prepayment rates change within a specified broad range of prepayment possibilities. Sequential pay bonds begin to pay principal when classes with an earlier priority have paid to a zero balance. Such bonds enjoy uninterrupted payment of principal until paid to a zero balance. In terms of credit risk, the U.S. government explicitly backs GNMA mortgage securities programs and is viewed by the market as implicitly backing FHLMC and FNMA mortgage securities programs.
- **Futures Contracts:** Futures contracts are contracts to buy or sell units of an index or financial instrument on a specified future date at a price agreed upon when the contract is originated. OP&F had futures exposure with nine external managers constituting \$2.17 billion

of notional value as of Dec. 31, 2019. This amount represented 13.16% of the total portfolio. OP&F uses this exposure to synthetics to maintain market exposure while also increasing liquidity and flexibility.

- **Forward-Currency Contracts:** Forward currency contracts are legal agreements between two parties to purchase and sell a foreign currency, for a price specified at the contract date, with delivery and settlement in the future. OP&F, through its external investment managers, enters into forward currency contracts to hedge underlying foreign currency exposure in its non-U.S. equity and fixed income portfolios back to the U.S. dollar or to provide the quantity of foreign currency needed to settle trades.

All the contracts are valued at the spot foreign exchange rate at Dec. 31, 2019. The changes in the value of the open contracts are recognized as unrealized appreciation/depreciation. A realized gain or loss is recorded at the time of the delivery/closing of the contract. The realized gain or loss is the difference between the value of the original contract and the closing/delivery value of such contracts. Both realized and unrealized gains and losses are included in the Statement of Changes in Fiduciary Net Position as net appreciation/depreciation. The following tables represent the balances of the outstanding currency transactions as of Dec. 31, 2019:

### OPEN CURRENCY CONTRACTS AS OF DEC. 31, 2019

Purpose	Fair Value (Outstanding Purchases)	Fair Value (Outstanding Sales)	Unrealized Appreciation/ (Depreciation)
Trade Settlement	\$3,156	\$(7,061)	\$(3,905)
Position Hedging	436,501	(1,277,706)	(841,205)
<b>GRAND TOTAL</b>	<b>\$439,657</b>	<b>\$(1,284,767)</b>	<b>\$(845,110)</b>

On delivered/closed currency contracts OP&F had realized gain of \$16,585 in 2019.

- **Options:** An option is the right, but not the obligation, to buy or sell a specific amount of a given security or other financial assets at a specified price during a specified period of time. OP&F invests in options as part of its portable alpha program. OP&F's exposure represented less than one percent of the total portfolio fair value at year-end.
- **Swaps:** A swap is a derivative contract through which two parties exchange financial instruments that involve cash flows based on a notional principal amount that both parties agree to. Usually, the principal does not change hands but each cash flow comprises one leg of the swap. One cash flow is generally fixed, while the other is variable and based on a benchmark interest rate, floating currency exchange rate or index price.

OP&F has not violated any legal, regulatory, or contractual provisions by its participation in these types of derivative instruments and there is no known undue credit, market, or legal risk. These instruments were purchased in order to enhance OP&F's overall rate of return.

OP&F invested in interest rate and credit default swaps through three external managers. The fair value for the total swap position at Dec. 31, 2019 was:

#### SWAP HOLDINGS AS OF DEC. 31, 2019

Type of Swap	Fair Value (Receive Side)	Fair Value (Pay Side)	Fair Value (Total Swap Position)
Credit Default Swap	\$145,820	\$(129,781)	\$16,039
Interest Rate Swap	1,497,465	(3,615,719)	(2,118,254)
<b>Total Swap Position</b>	<b>\$1,643,285</b>	<b>\$(3,745,500)</b>	<b>\$(2,102,215)</b>

## 6. DEFERRED COMPENSATION PLAN

OP&F does not sponsor a deferred compensation program. OP&F employees are eligible to participate in the deferred compensation plan sponsored by the State of Ohio. The state-sponsored plan was created in accordance with IRS Code Section 457. The plan is available to all OP&F employees and permits them to defer a portion of their salary until future years. Deferred compensation assets are not available to employees until termination, retirement, death, or unforeseeable emergency.

IRS Code Section 457 requires that the amount of compensation assets deferred under a plan, all property and rights and all income attributable to those amounts, property or rights, be held in trust for the benefit of the participants. This insulates IRS Code Section 457 benefits from the claims of an employer's general creditors. Accordingly, OP&F does not include the deferred compensation assets or liabilities of the Ohio Deferred Compensation Plan in its financial statements.

## 7. COMPENSATED ABSENCES

As of Dec. 31, 2019, \$2.8 million were accrued for unused vacation and sick leave for OP&F employees. To help OP&F reduce and manage the vacation liability, all employees with at least one year of continuous service as of the beginning of the current calendar year are required to use five consecutive workdays of vacation leave each year. Upon termination of employment, employees will be paid for unused vacation time that has been earned through the last day of work. Three-fourths of accrued but unused sick leave will be paid at the employee's base rate upon termination of employment.

## 8. SELF-INSURED HEALTH CARE FOR EMPLOYEES OF OP&F

OP&F is self-insured for employee benefits for medical, dental, vision and prescription coverage. A third-party administrator manages the program. OP&F holds a stop-loss policy per covered life per year with a \$100,000 specific deductible.

## 9. COMMITMENTS AND CONTINGENCIES

OP&F is a defendant in a number of lawsuits pertaining to matters that are incidental to performing routine business functions. OP&F's management is of the opinion that ultimate resolution of such claims will not result in a material, adverse effect on OP&F's financial position as of Dec. 31, 2019.

OP&F is committed to making additional capital contributions to the following investment types as of Dec. 31, 2019:

Asset Class	Unfunded Commitments	Fair Value At Dec. 31, 2019
Private Equity*	\$564,567,660	\$1,418,364,017
Private Debt	118,974,852	593,814,395
Real Estate	268,545,838	1,812,655,901
Real Assets	187,350,133	489,307,759
<b>TOTAL</b>	<b>\$1,139,438,483</b>	<b>\$4,314,142,072</b>

\* Included in the Private Equity are six Euro based unfunded commitments totaling as of Dec. 31, 2019: €33,846,554 (€ = Euro) (\$37,992,761 U.S.D.).

Unfunded Commitments do not include distributions subject to recall.

## 10. State of Ohio Public Safety Officers Death Benefit Fund

Pursuant to ORC Section 742.62, the Board of Trustees of the OP&F administers the State of Ohio Public Safety Officers Death Benefit Fund. This program was established by the State of Ohio to provide monthly benefit payments to eligible surviving family members of Ohio public safety officers who have been killed in the line of duty or die of a duty-related injury or illness. Funds are disbursed to OP&F on a quarterly basis each state fiscal year (July 1-June 30) and are paid monthly by OP&F to eligible recipients. The unused balance at June 30 is returned to the State. The Public Safety Officers Death Benefit Fund is considered to be an agency fund administered by OP&F and, accordingly, its assets of \$1,178,907 and the related liability for unpaid benefits are included in the accompanying financial statements as of Dec. 31, 2019.

## 11. Employers' Net Pension Liability (Asset)

The components of the net pension liability of employers as of Dec. 31, 2019:

Year Ending Dec. 31	(a) Total Pension Liability	(b) Plan Fiduciary Net Position	(a)-(b)=(c) Net Pension Liability (Asset)	(b) / (a) Plan Fiduciary Net Pension as a Percentage of Total Pension Liability	(d) Covered Payroll	(c) / (d) Net Pension Liability (Asset) as a Percentage of Covered Payroll
2019	\$22,373,124,957	\$15,636,590,807	\$6,736,534,150	69.89%	\$2,373,429,623	283.83%

The total pension liability is determined by OP&F's actuaries in accordance with GASB Statement No. 67, as part of their annual valuation. Actuarial valuations of an ongoing retirement plan involve estimates of the value of reported amounts and assumptions about probability of occurrence of events far into the future. Examples include assumptions about future employment mortality, salary increases, disabilities, retirements and employment terminations. Actuarially determined amounts are subject to continual review and potential modifications, as actual results are compared with past expectations and new estimates are made about the future.

The Schedule of Employers' Net Pension Liability presents multi-year trend information about whether the fiduciary net positions are increasing or decreasing over time relative to the total pension liability. These schedules are presented in the RSI section. The total pension liability as of Dec. 31, 2019, is based on the results of an actuarial valuation date of Jan. 1, 2019 and rolled-forward using generally accepted actuarial procedures.

A summary of the actuarial assumptions as of the latest actuarial valuation is shown below.

### Actuarial Assumptions:

Valuation date	Jan. 1, 2019
Actuarial cost method	Entry age
Investment rate of return	8.00%
Projected salary increases	3.75% - 10.50%
Payroll increases	3.25%
Inflation assumptions	2.75%
Cost-of-living adjustments	2.20% and 3.00% simple
Healthy Mortality	RP-2014 Total Employee and Healthy Annuitant Mortality Tables rolled back to 2006, adjusted and projected with the Buck Modified 2016 Improvement Scale. Rates for surviving beneficiaries are adjusted by 120%.
Disability Mortality	RP-2014 Disability Mortality Tables rolled back to 2006, adjusted and projected with the Buck Modified 2016 Improvement Scale.

The long-term expected rate of return on pension plan investments was determined using a building-block approach and assumes a time horizon, as defined in the Statement of Investment Policy. A forecasted rate of inflation serves as the baseline for the return expected. Various real return premiums over the baseline inflation rate have been established for each asset class. The long-term expected nominal rate of return has been determined by calculating a weighted average of the expected real return premiums for each asset class, adding the projected inflation rate and adding the expected return from rebalancing uncorrelated asset classes. Best estimates of the long-term expected real rates of return for each major asset class included in OP&F's target asset allocation as of Dec. 31, 2019 are summarized below:

#### TARGET ALLOCATIONS (SOURCE: WILSHIRE ASSOCIATES)

Asset Class	Target Allocation	10 Year Expected Real Rate of Return**	30 Year Expected Real Rate of Return**
Cash and Cash Equivalents	-%	0.1%	1.0%
Domestic Equity	16.0%	3.9%	5.4%
International Equity	16.0%	4.7%	5.8%
Private Markets	8.0%	6.1%	8.0%
Core Fixed Income *	23.0%	1.1%	2.7%
High Yield Fixed Income	7.0%	2.5%	4.7%
Private Credit	5.0%	4.8%	5.5%
U.S. Inflation Linked Bonds *	17.0%	0.4%	2.5%
Midstream Energy Infrastructure	8.0%	5.8%	6.6%
Real Assets	8.0%	6.9%	7.4%
Private Real Estate	12.0%	5.4%	6.4%
<b>TOTAL</b>	<b>120.0%</b>		

Note: Assumptions are geometric.

\* Levered 2x.

\*\* Numbers are net of expected inflation.

OP&F's Board of Trustees has incorporated the risk parity concept into OP&F's asset liability valuation and its overall asset allocation. Risk parity has a goal of reducing equity risk exposure, which reduces overall Total Portfolio risk without sacrificing return and creating a more risk-balanced portfolio based on the relationship between asset classes and economic environments. From the notional portfolio perspective above, the Total Portfolio may be levered up to 1.20 times due to the application of leverage in certain fixed income asset classes.

Total pension liability was calculated using the discount rate of 8.00%. The projection of cash flows used to determine the discount rate assumed the contributions from employers and from members would be computed based on contribution requirements as stipulated by state statute. Projected inflows from investment earnings were calculated using the longer-

term assumed investment rate of return 8.00%. Based on those assumptions, OP&F's fiduciary net position was projected to be available to make all future benefit payments of current plan members. Therefore, a long-term expected rate of return on pension plan investments was applied to all periods of projected benefits to determine the total pension liability.

Net pension liability is sensitive to changes in the discount rate. To illustrate the potential impact the following table presents the net pension liability calculated using the discount rate of 8.00%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1% lower, 7.00%, or 1% higher, 9.00%, than the current rate.

### CHANGES IN DISCOUNT RATE

Sensitivity of the Net Pension Liability to Changes in the Discount Rate at Dec. 31, 2019

	1% Decrease	Current Discount Rate	1% Increase
Discount Rate	7.00%	8.00%	9.00%
Total Pension Liability	\$24,973,192,944	\$22,373,124,957	\$20,198,425,901
Plan Fiduciary Net Position	15,636,590,807	15,636,590,807	15,636,590,807
<b>NET PENSION LIABILITY (ASSET)</b>	<b>\$9,336,602,137</b>	<b>\$6,736,534,150</b>	<b>\$4,561,835,094</b>

## 12. Net Other Post-Employment Benefits (OPEB) Liability and Actuarial Information

### PLAN ADMINISTRATION

The OP&F Board of Trustees is responsible for administering the OP&F retiree health care stipend program, a cost-sharing, multiple-employer, defined benefit OPEB plan that provides various levels of health care to eligible benefit recipients and their eligible dependents. The OP&F Board of Trustees governs the health care stipend program under Chapter 742 of the ORC. The nine member Board of Trustees consists of four elected active members, two elected retired members and three state appointed professional investment experts.

### PLAN MEMBERSHIP

As of Jan. 1, 2019, OP&F's health care program membership consisted of the following:

### PARTICIPANTS BY STATUS

Status	Number
Active Members*	28,904
Inactive Members Eligible for Allowances	226
Retiree Members or their Beneficiaries Currently Receiving Benefits	24,969
<b>TOTAL</b>	<b>54,099</b>

\* Excludes Rehired Retirees.

### BENEFITS PROVIDED

On Jan. 1, 2019, OP&F changed the way it supports retiree health care. A stipend-based health care model has replaced the self-insured group health care plan that had been in place. OP&F has contracted with a vendor who can assist eligible retirees in choosing health care plans that are available where they live (both Medicare-eligible and pre-65 populations). A stipend funded by OP&F is available to these members through a Health Reimbursement Arrangement and can be used to reimburse retirees for qualified health care expenses. As a result of this change, it is expected that the solvency of the HCSF will be extended allowing OP&F to provide stipends to eligible participants.

### CONTRIBUTIONS

On Jan. 1, 2019, OP&F made the transition to a stipend-based health care model. OP&F's health care plan is financed through a combination of employer contributions and investment returns. A portion of OP&F's investment gain/loss is allocated to the Health Care Stabilization Fund (HCSF). In 2019, OP&F's investment portfolio had a favorable gross return of 17.89%. During 2019, the Board of Trustees allocated employer contributions equal to 0.5% of annual covered payroll to the HCSF.

### INVESTMENT POLICY

The health care stipend program follows the same investment policy and guidelines as the pension plan.

### DISCOUNT RATE

The discount rate used to measure the total OPEB liability at Jan. 1, 2019 and rolled forward to Dec. 31, 2019 was 3.56% (using Dec. 31, 2019's S&P Municipal Bond 20 Year High Grade Rate Index of 2.75%). The discount rate used to measure the total OPEB liability as of Jan. 1, 2018 and rolled forward to Dec. 31, 2018 was 4.66% (using Dec. 31, 2018's S&P Municipal Bond 20 Year High Grade Rate Index of 4.13%). The projection of cash flows used to determine the discount rate assumed that OP&F will contribute at a rate equal to 0.50% of payroll. Based on those assumptions, the OPEB plan's fiduciary net position was projected to be available to make all projected OPEB payments for current active and inactive employees until 2034. After that time, the funding of benefit payments is uncertain. The discount rate is the single equivalent rate which results in the same present value as discounting future benefit payments made from assets at the long term expected rate of return and discounting future benefit payments funded on a pay-as-you-go basis on the municipal bond 20-year index rate.

### RATE OF RETURN

The long-term expected rate of return on plan assets is reviewed as part of the actuarial five-year experience study. The most recent study covered fiscal years 2012 through 2016. Several factors are considered in evaluating the long-term rate of return assumption including long-term historical data, estimates inherent in current market data, each major investment asset class and expected inflation. Based on this recent study it was recommended by the actuary and adopted by the Board of Trustees that the long-term expected rate of return be changed from 8.25% to 8.00%. This change was effective as of Jan. 1, 2017.

The long-term expected rate of return on pension plan investments was determined using a building-block approach and assumes a time horizon, as defined in the Statement of Investment Policy and Guidelines. A forecasted rate of inflation serves as the baseline for the return expected. Various real return premiums over the baseline inflation rate have been established for each asset class. The long-term expected nominal rate of return has been determined by calculating a weighted average of the expected real return premiums for each asset class, adding the projected inflation rate and adding the expected return from rebalancing uncorrelated asset classes.

**PERIODS OF PROJECTED BENEFIT PAYMENTS**

Future benefit payments for all current plan members were projected through 2118.

**ASSUMED ASSET ALLOCATION**

The target asset allocation and best estimates of geometric real rates of return for each major asset class is summarized as follows:

**TARGET ALLOCATIONS (SOURCE: WILSHIRE ASSOCIATES)**

<b>Asset Class</b>	<b>Target Allocation</b>	<b>10 Year Expected Real Rate of Return**</b>	<b>30 Year Expected Real Rate of Return**</b>
Cash and Cash Equivalents	-%	0.1%	1.0%
Domestic Equity	16.0%	3.9%	5.4%
International Equity	16.0%	4.7%	5.8%
Private Markets	8.0%	6.1%	8.0%
Core Fixed Income *	23.0%	1.1%	2.7%
High Yield Fixed Income	7.0%	2.5%	4.7%
Private Credit	5.0%	4.8%	5.5%
U.S. Inflation Linked Bonds *	17.0%	0.4%	2.5%
Midstream Energy Infrastructure	8.0%	5.8%	6.6%
Real Assets	8.0%	6.9%	7.4%
Private Real Estate	12.0%	5.4%	6.4%
<b>TOTAL</b>	<b>120.0%</b>		

Note: Assumptions are geometric.

\* Levered 2x.

\*\* Numbers are net of expected inflation.

OP&F's Board of Trustees has incorporated the risk parity concept into OP&F's asset liability valuation and its overall asset allocation. Risk parity has a goal of reducing equity risk exposure, which reduces overall Total Portfolio risk without sacrificing return and creating a more risk-balanced portfolio based on the relationship between asset classes and economic environments. From the notional portfolio perspective above, the Total Portfolio may be levered up to 1.20 times due to the application of leverage in certain fixed income asset classes.

**NET OPEB LIABILITY OF OP&F**

The total OPEB liability as of Dec. 31, 2019 was determined based on a no gain (loss) roll-forward of the Jan. 1, 2019 valuation. The components of the net OPEB liability of OP&F at Dec. 31, 2019, were as follows:

**NET OPEB LIABILITY OF OP&F**

Total OPEB Liability	\$1,866,462,020
Plan Fiduciary Net Position	878,688,997
<b>OP&amp;F'S NET OPEB LIABILITY</b>	<b>\$987,773,023</b>
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	47.08%
Net OPEB Liability as a Percentage of Covered Payroll	41.62%

**ACTUARIAL ASSUMPTIONS**

The actuarial assumptions used in the valuation were adopted as of Jan. 1, 2017 and were based on the results from the most recent actuarial experience review covering the period 2012 through 2016. The total OPEB liability as of Dec. 31, 2019, is based on the results of an actuarial valuation dated Jan. 1, 2019 and rolled-forward using generally accepted actuarial procedures.

The total OPEB liability used the following assumptions and other inputs:

**ACTUARIAL ASSUMPTIONS:**

Valuation Date	Jan. 1, 2019
Long-Term Return on Plan Assets	8.00%
Dec. 31, 2019 Discount Rate	3.56%
Dec. 31, 2019 Municipal Bond Index	2.75%
Actuarial Cost Method	Entry age normal cost.
Payroll Growth Rate	3.25% per annum
Stipend Increase Rate	The stipend is not assumed to increase over the projection period.
Projected Depletion Year of OPEB Assets	2034 (per GASB Statement No. 74 Report)
Health Care Cost Trend Rate	N/A - based on a medical benefit that is a flat dollar amount; therefore, it is unaffected by a health care cost trend rate.
Healthy Mortality	RP-2014 Total Employee and Healthy Annuitant Mortality Tables rolled back to 2006, adjusted and projected with the Buck Modified 2016 Improvement Scale. Rates for surviving beneficiaries are adjusted by 120%.
Disability Mortality	RP-2014 Disability Mortality Tables rolled back to 2006, adjusted and projected with the Buck Modified 2016 Improvement Scale.
Age of Spouse	Wives are assumed to be three years younger than their husbands.
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.

### SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGES IN THE DISCOUNT RATE

The following table presents the net OPEB liability of OP&F as of Dec. 31, 2019, calculated using the discount rate of 3.56%, as well as what OP&F's net OPEB liability would be if it were calculated using a discount rate that is 1% lower, 2.56%, or 1% higher, 4.56%, than the current discount rate:

### SENSITIVITY OF THE NET OPEB LIABILITY TO CHANGES IN THE DISCOUNT RATE AT DEC. 31, 2019

	1% Decrease	Current Discount Rate	1% Increase
Discount Rate	2.56%	3.56%	4.56%
Net OPEB Liability	\$1,224,774,839	\$987,773,023	\$790,841,095

## 13. DEFINED BENEFIT PENSION PLANS

### NET PENSION LIABILITY

The net pension liability reported on the statement of fiduciary net position represents a liability to employees for pensions. Pensions are a component of exchange transactions, between an employer and its employees, of salaries and benefits for employee services. Pensions are provided to an employee, on a deferred-payment basis as part of the total compensation package offered by an employer for employee services each financial period. The obligation to sacrifice resources for pensions is a present obligation because it was created as a result of employment exchanges that already have occurred.

The net pension liability represents OP&F's proportionate share of each pension plan's collective actuarial present value of projected benefit payments attributed to past periods of service, net of each pension plan's fiduciary net position. The net pension liability calculation is dependent on critical long-term variables, including estimated average life expectancies, earnings on investments, cost of living adjustments and others. While these estimates use the best information available, unknown future events require this estimate to be adjusted annually.

ORC limits OP&F's obligation for this liability to annually required payments. OP&F cannot control benefit terms or the manner in which pensions are financed; however, OP&F does receive the benefit of employees' services in exchange for compensation including pension.

GASB No. 68 assumes the liability is solely the obligation of the employer, because (1) they benefit from employee services; and (2) state statute requires all funding to come from these employers. All contributions to date have come solely from these employers (which also includes costs paid in the form of withholdings from employees). State statute requires the pension plans to amortize unfunded liabilities within 30 years. If the amortization period exceeds 30 years, each pension plan's board must propose corrective action to the state legislature. Any resulting legislative change to benefits or funding could significantly affect the net pension liability. Resulting adjustments to the net pension liability would be effective when the changes are legally enforceable.

The proportionate share of each plan's unfunded benefits is presented as a long-term net pension liability on the accrual basis of accounting. Any liability for the contractually-required pension contribution outstanding at the end of the year is included in intergovernmental payable on the accrual basis of accounting.

### PLAN DESCRIPTION – OHIO PUBLIC EMPLOYEES RETIREMENT SYSTEM (OPERS)

Public employees participate in OPERS, a cost-sharing multiple-employer public employee retirement system administered by OPERS. OPERS provides retirement and disability benefits to members and death and survivor benefits to beneficiaries. OPERS also provides health care benefits to some retirees and beneficiaries. OPERS issues a stand-alone financial report that includes financial statements, RSI and detailed information about OPERS' fiduciary net position. That report can be obtained by writing to OPERS, 277 E. Town Street, Columbus, OH 43215, or by visiting the OPERS website: [www.OPERS.org](http://www.OPERS.org).

New members have a choice of three retirement plans: The Traditional Plan (defined benefit plan); the Combined Plan (combination of defined benefit and defined contribution plans); and the Member Directed Plan (defined contribution plan with the option upon retirement to use the defined contribution account balance to purchase a defined benefit annuity). Benefits are established by Chapter 145 of the ORC. The defined benefit (DB) plan offers an annual retirement allowance based on final average salary multiplied by a percentage that varies based on years of service.

Senate Bill (SB) 343 was enacted into law with an effective date of Jan. 7, 2013. In the legislation, members were categorized into three groups with varying provisions of the law applicable to each group. Members who were eligible to retire under law in effect prior to SB 343 or who will be eligible to retire no later than five years after Jan. 7, 2013 comprise transition Group A. Members who have 20 years of service credit prior to Jan. 7, 2013 or who will be eligible to retire no later than 10 years after Jan. 7, 2013 are included in transition Group B. Group C includes those members who are not in either of the other groups and members who were hired on or after Jan. 7, 2013.

Benefit payments vary in amount depending on years of service credit, final average salary (FAS), age and plan of payment selection. FAS is the average of the three highest years of earnable salary for Group A and B; and the average of the five highest years of earnable salary for members in Group C. The age-and-service formula benefit cannot exceed 100% of the FAS (Law Enforcement is 90%) or the limits under IRC Section 415 and may be subject to the contribution-based benefit cap. The base benefit amount calculated by the formula will be reduced if a member begins receiving a retirement benefit before reaching the age-and-service requirements for an unreduced benefit.

In the Traditional Pension Plan (DB), the benefit formula for the state and local members in transition Group A and B applies a factor of 2.2% to the member's FAS for the first 30 years of service. A factor of 2.5% is applied to years of service in excess of 30. The benefit formula for state and local members in transition Group C applies a factor of 2.2% to the member's FAS for the first 35 years of service and a factor of 2.5% is applied to years of service in excess of 35.

In the Combined Plan, the benefit formula for the defined benefit component of the plan for state and local members in transition Group A and B applies a factor of 1% to the member's FAS for the first 30 years of service. A factor of 1.25% is applied to years of service in excess of 30. The benefit formula for transition Group C applies a factor of 1% to the member's FAS and the first 35 years of service and a factor of 1.25% is applied to years in excess of 35.

When a benefit recipient has received benefits for 12 months, an annual COLA is provided. This COLA is calculated on the base retirement benefit at the date of retirement and is not compounded. For those retiring prior to Jan. 7, 2013, the COLA will continue to be 3% simple annual COLA. For those retiring after Jan. 7, 2013, beginning in calendar year 2019, the COLA will be based on the average percentage increase in the Consumer Price Index, capped at 3%.

A DB or Combined Plan member with five or more years of credit service who is determined to be disabled may qualify for a disability benefit.

#### FUNDING POLICY – OPERS

Employees covered by OPERS are required to contribute 10% of their salary to the plan and employers are required to contribute 14%. Both rates are at the statutory maximum.

OP&F's contractually required contribution to OPERS was \$2,588,148 for year end Dec. 31, 2019. Of this amount \$1,509,753 is reported as a deferred outflow – contribution subsequent to the measurement date.

#### PENSION LIABILITIES, PENSION EXPENSE, DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES RELATED TO PENSIONS

The net pension liability was measured as of Dec. 31, 2018 and the total pension liability used to calculate the net pension liability was determined by an actuarial valuation as of that date. OP&F's proportion of the net pension liability was based on OP&F's share of contributions to the pension plan relative to the contributions of all participating entities. Following is information related to the proportionate share and pension expense:

OPERS	Traditional Pension Plan	Combined Plan	Member Directed Plan	TOTAL
Proportionate Share of the Net Pension Asset	\$-	\$139,322	\$5,909	\$145,231
Proportionate Share of the Net Pension Liability	\$(17,148,431)	\$-	\$-	\$(17,148,431)
Proportion of the Net Pension Asset/Liability	0.062613%	0.124592%	0.259327%	
Pension Expense	\$2,610,899	\$(47,346)	\$(3,396)	\$2,560,157

At Dec. 31, 2019, OP&F reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

OPERS	Traditional Pension Plan	Combined Plan	Member Directed Plan	TOTAL
<b>Deferred Outflows of Resources</b>				
Differences between expected and actual experience	\$49,509	\$-	\$19,917	\$69,426
Net difference between projected and actual earnings on pension plan investments	1,207,211	19,463	1,565	1,228,239
Changes of Assumptions	1,093,206	29,473	1,657	1,124,336
Changes in proportion and differences	153,016	8,545	88	161,649
Contributions subsequent to the measurement date	1,270,608	80,017	159,128	1,509,753
<b>TOTAL DEFERRED OUTFLOWS OF RESOURCES</b>	<b>3,773,550</b>	<b>137,498</b>	<b>182,355</b>	<b>4,093,403</b>
<b>Deferred Inflows of Resources</b>				
Differences between expected and actual experience	(121,268)	(44,810)	-	(166,078)
Changes of Assumptions	(698,945)	(1,919)	(127)	(700,991)
Changes in proportion and differences	(5,440)	(1,962)	(205)	(7,607)
<b>TOTAL DEFERRED INFLOWS OF RESOURCES</b>	<b>(825,653)</b>	<b>(48,691)</b>	<b>(332)</b>	<b>(874,676)</b>

Deferred outflows of resources related to pensions resulting from OP&F's contributions subsequent to the measurement date were \$1,509,753 and will be recognized as a reduction of the net pension liability in the year ending Dec. 31, 2020. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pension will be recognized in pension expense as indicated in the following amortization schedule. Deferrals arising from differences between projected and actual earnings on pension plan

investments will be amortized over five years for all three plans. Deferrals arising from differences between projected and actual experience will be amortized over the average remaining service life of the entire pool of employees. The Traditional Plan has 2.8942 years of average remaining service life. The Combined Plan has 9.1680 years of average remaining service life and the Member Directed Plan has 10.1485 years of average remaining service life.

OPERS Fiscal Year Ending Dec. 31:	Traditional Pension Plan	Combined Plan	Member Directed Plan	TOTAL
2020	\$938,304	\$3,304	\$2,866	\$944,474
2021	(295,595)	(1,547)	2,601	(294,541)
2022	147,310	302	2,725	150,337
2023	887,270	9,340	3,413	900,023
2024	-	(2,040)	2,510	470
2025	-	(1,194)	2,502	1,308
2026	-	(6)	2,244	2,238
2027	-	(138)	1,660	1,522
2028	-	587	1,374	1,961
2029	-	182	889	1,071
2030	-	-	111	111
<b>TOTAL</b>	<b>\$1,677,289</b>	<b>\$8,790</b>	<b>\$22,895</b>	<b>\$1,708,974</b>

**ACTUARIAL ASSUMPTIONS – OPERS**

OPERS' total pension liability was determined by their actuaries in accordance with GASB Statement No. 67, as part of their annual actuarial valuation for each defined benefit retirement plan. Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts (e.g., salaries, credited service) and assumptions about the probability of occurrence of events far into the future (e.g., mortality, disabilities, retirements, employment termination). Actuarially determined amounts are subject to continual review and potential modifications, as actual results are compared with past expectations and new estimates are made about the future.

Projections of benefits for financial reporting purposes are based on the substantive plan (the plan as understood by the employers and plan members) and include the types of benefits provided at the time of each valuation and the historical pattern of sharing benefit costs between the employers and plan members to that point. The projection of

benefits for financial reporting purposes does not explicitly incorporate the potential effects of legal or contractual funding limitations.

Actuarial calculations reflect a long-term perspective. For a newly hired employee, actuarial calculations will take into account the employee's entire career with the employer and also take into consideration the benefits, if any, paid to the employee after termination of employment until the death of the employee and any applicable contingent annuitant. In many cases actuarial calculations reflect several decades of service with the employer and the payment of benefits after termination.

Key methods and assumptions used in calculating the total pension liability in the latest actuarial valuation, prepared as of Dec. 31, 2018, are presented below:

**KEY METHODS AND ASSUMPTIONS USED IN VALUATION OF TOTAL PENSION LIABILITY**

<b>Actuarial Information</b>	<b>Traditional Pension Plan</b>	<b>Combined Plan and Member Directed Plan</b>
Valuation Date	Dec. 31, 2018	Dec. 31, 2018
Experience Study	5-Year Period Ended Dec. 31, 2015	5-Year Period Ended Dec. 31, 2015
Actuarial Cost Method	Individual entry age	Individual entry age
<b>Actuarial Assumptions</b>		
Investment Rate of Return	7.20%	7.20%
Wage Inflation	3.25%	3.25%
Projected Salary Increases	3.25%-10.75% (includes wage inflation at 3.25%)	3.25%-8.25% (includes wage inflation at 3.25%)
Cost-of-living Adjustments	Pre Jan. 7, 2013 Retirees: 3.00% Simple Post Jan. 7, 2013 Retirees: 3.00% Simple Through 2018, then 2.15% Simple	Pre Jan. 7, 2013 Retirees: 3.00% Simple Post Jan. 7, 2013 Retirees: 3.00% Simple Through 2018, then 2.15% Simple

Mortality rates are based on the RP-2014 Healthy Annuitant mortality table. For males, Healthy Annuitant Mortality tables were used, adjusted for mortality improvements back to the observation period base of 2006 and then established the base year as 2015. For females, Healthy Annuitant Mortality tables were used, adjusted for mortality improvements back to the observation period base year of 2006 and then established the base year as 2010. The mortality rates used in evaluating disability allowances were based on the RP-2014 Disabled mortality tables, adjusted for mortality improvements back to the observation base year of 2006 and then established the base year as 2015 for males and 2010 for females. Mortality rates for a particular calendar year for both healthy and disabled retiree mortality tables are determined by applying the MP-2015 mortality improvement scale to the above described tables.

#### DISCOUNT RATE – OPERS

The discount rate used to measure the total pension liability was 7.5%, post-experience study results, for the Traditional Pension Plan, Combined Plan and Member-Directed Plan. The projection of cash flows used to determine the discount rate

assumed that contributions from plan members and those of the contributing employers are made at the contractually required rates, as actuarially determined. Based on those 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 rates of return on pension plan investments for the Traditional Pension Plan, Combined Plan and Member-Directed Plan was applied to all periods of projected benefit payments to determine the total pension liability.

#### SENSITIVITY OF OP&F'S PROPORTIONATE SHARE TO THE NET PENSION LIABILITY TO CHANGES IN THE DISCOUNT RATE

The following table presents OP&F's proportionate share of the net pension liability calculated using the current period discount rate assumption of 7.5% as well as what OP&F's proportionate share of the net pension liability would be if it were calculated using a discount rate that is 1% lower, 6.5%, or 1% higher, 8.5%, than the current rate.

OP&F's proportionate share of the Net Pension Liability (Asset)	1% Decrease	Current Discount Rate	1% Increase
Discount Rate	6.2%	7.2%	8.2%
Traditional Pension Plan	\$25,333,220	\$17,148,431	\$10,346,798
Combined Plan	\$(46,099)	\$(139,322)	\$(206,823)
Member Directed Plan	\$(2,593)	\$(5,909)	\$(10,373)

<b>Asset Class</b>	<b>Target Allocation for 2018</b>	<b>Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)</b>
Fixed Income	23.00%	2.79%
Domestic Equities	19.00%	6.21%
Real Estate	10.00%	4.90%
Private Equity	10.00%	10.81%
International Equities	20.00%	7.83%
Other Investments	18.00%	5.50%
<b>TOTAL</b>	<b>100.00%</b>	<b>5.95%</b>

The table above displays OPERS' Board-approved asset allocation policy of the Defined Benefit portfolio for 2018 and long-term expected real rates of return.

The long-term expected rate of return on defined benefit investment assets was determined using a building-block method in which best-estimate ranges of expected future real rates of return 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, adjusted for inflation.

During 2018, OPERS managed investments in three investment portfolios: the DB Portfolio, the Health Care portfolio, and the Defined Contribution portfolio. The DB portfolio contains the investment assets of the Traditional Pension Plan, the DB component of the Combined Plan and the annuitized accounts of the Member-Directed Plan. Within the DB Portfolio, contributions into the plans are all recorded at the same time, and benefit payments all occur on the first of the month. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the DB portfolio was a loss of 2.94% for 2018.

## 14. DEFINED BENEFIT OPEB PLAN

### NET OPEB LIABILITY

The net OPEB liability reported on the statement of fiduciary net position represents the liability of employers and non-employer contributing entities to employees for defined benefit other post-employment benefits other than pensions. It is included in accounts payable and accrued expenses in the statement of fiduciary net position. OP&F, a cost-sharing, multiple-employer public employee retirement system, is required under GASB Statement No. 75 to recognize a liability for its proportionate share of the net OPEB liability from OPERS. The net OPEB liability is an actuarially determined portion of the present value of projected benefit payments to be provided to current active and inactive employees that is attributed to those employees' past periods of total service (total OPEB liability), less the amount of the OPEB plan's fiduciary net position. OP&F is also required to recognize OPEB expense and report deferred outflows and inflows of resources related to OPEB.

### OPEB PLAN DESCRIPTION

OPERS is a cost-sharing, multiple-employer public employee retirement system comprised of three separate pension plans: the Traditional Pension Plan, a defined benefit plan; the Combined Plan, a combination defined benefit/defined contribution plan; and the Member-Directed Plan, a defined contribution plan. All state and local governmental employees in Ohio, except those covered by one of the other state or local retirement systems in Ohio, are members of OPERS. New public employees (those who establish membership in OPERS on or after Jan. 1, 2003) have 180 days from the commencement of employment to select membership in one of the three pension plans. Contributions to OPERS are effective with the first day of the member's employment. Contributions made prior to the member's plan selection are maintained in the Traditional Pension Plan and later transferred to the plan elected by the member, as appropriate.

As of December 2016, OPERS maintains one health care trust, the 115 Health Care Trust (115 Trust), which was established in 2014 to initially provide a funding mechanism for a health reimbursement arrangement (HRA), as the prior trust structure could not support the HRA. In March 2016, OPERS received two favorable rulings from the Internal Revenue Service (IRS) allowing OPERS to consolidate health care assets into the 115 Trust. The 401(h) Health Care Trust (401(h) Trust) was a prefunded trust that provided health care funding for eligible members of the Traditional Pension Plan and the Combined Plan through Dec. 31, 2015, when the plans funded through

the 401(h) Trust were terminated. The Voluntary Employees' Beneficiary Association Trust (VEBA Trust) accumulated funding for retiree medical accounts for participants in the Member-Directed Plan through June 30, 2016. The 401(h) Trust and the VEBA Trust were closed as of June 30, 2016, and the net positions transferred to the 115 Trust on July 1, 2016. Beginning in 2016, the 115 Trust, established under Internal Revenue Code (IRC) Section 115, is the funding vehicle for all health care plans.

The OPERS health care plans are reported as other post-employment benefit plans (OPEB) based on the criteria established by the Governmental Accounting Standards Board (GASB). Periodically, OPERS modifies the health care program design to improve the ongoing solvency of the plans. Eligibility requirements for access to the OPERS health care options have changed over the history of the program for Traditional Pension Plan and Combined Plan members. Prior to Jan. 1, 2015, 10 or more years of service were required to qualify for health care coverage. Beginning Jan. 1, 2015, generally, members must be at least age 60 with 20 years of qualifying service credit to qualify for health care coverage or 30 years of qualifying service at any age. Beginning 2016, Traditional Pension Plan and Combined Plan retirees enrolled in Medicare A and B were eligible to participate in the OPERS Medicare Connector (Connector). The Connector, a vendor selected by OPERS, assists eligible retirees in the selection and purchase of Medicare supplemental coverage through the Medicare market. Retirees who purchase supplemental coverage through the Connector may receive a monthly allowance in their HRA that can be used to reimburse eligible health care expenses.

Upon termination or retirement, Member-Directed Plan participants can use vested RMA funds for reimbursement of qualified medical expenses. Members who elect the Member-Directed Plan after July 1, 2015 will vest in the RMA over 15 years at a rate of 10% each year starting with the sixth year of participation. Members who elected the Member-Directed Plan prior to July 1, 2015, vest in the RMA over a five-year period at a rate of 20% per year. Health care coverage is neither guaranteed nor statutorily required.

OPERS is administrated in accordance with Chapter 145 of the Ohio Revised Code (ORC). OPERS is not part of the state of Ohio financial-reporting entity, nor is OPERS a component unit of the state of Ohio. Responsibility for the organization is vested in the OPERS Board of Trustees; there is no financial interdependency with the state of Ohio. The OPERS Board of Trustees is the governing body of OPERS, with responsibility for administration and management. Of the OPERS Board of Trustees, seven members are elected by the group they represent; the retirees (two representatives), employees of

the state, employees of counties, employees of municipalities, non-teaching employees of state colleges and universities and miscellaneous employees. The remaining four members are appointed or designated by position. The Governor, General Assembly and the Treasurer of the State of Ohio each appoint a representative. The Director of the Ohio Department of Administrative Services completes the OPERS Board of Trustees.

The OPERS Board of Trustees appoints the Executive Director, an actuary, investment consultants and other consultants necessary for the transaction of business. The OPERS Board of Trustees meets monthly and receives no compensation, but is reimbursed for necessary expenses.

All state and local governmental employees, except those covered by another state retirement system in Ohio or the Cincinnati Retirement System, are required to become contributing members of OPERS when they begin public employment unless they are exempted or excluded as defined by the ORC. For actuarial purposes, employees who have earned sufficient service credit (60 contributing months) are entitled to a future pension benefit from OPERS. Employer, employee and retiree data as of Dec. 31, 2018, can be found in the OPERS 2018 CAFR.

#### **OPEB BENEFITS - OPERS**

All benefits of OPERS, and any benefit increases, are established by the legislature pursuant to ORC Chapter 145. The OPERS Board of Trustees, pursuant to ORC Chapter 145, has elected to maintain funds to provide health care coverage to eligible Traditional Pension Plan and Combined Plan retirees and survivors of members. Health care coverage does not vest and is not required under ORC Chapter 145. As a result, coverage may be reduced or eliminated at the discretion of the OPERS Board of Trustees. The health care portion of the employer contribution rate for the Traditional Pension Plan and Combined Plan is comparable, as the same coverage options are provided to participants in both plans.

Prior to Jan. 1, 2015, OPERS provided comprehensive health care coverage to retirees with 10 or more years of qualifying service credit and offered coverage to their dependents on a premium deduction or direct bill basis. Beginning Jan. 1, 2015, the service eligibility criteria for health care coverage increased from 10 years to 20 years with a minimum age of 60, or 30 years of qualifying service at any age. Beginning with January 2016 premiums, Medicare-eligible retirees could select supplemental coverage through the Connector, and may be eligible for monthly allowances deposited to an HRA to be used for reimbursement of eligible health care expenses. Coverage for non-Medicare retirees includes hospitalization, medical expenses and prescription drugs. OPERS determines

the amount, if any, of the associated health care costs that will be absorbed by OPERS and attempts to control costs by using managed care, case management, and other programs.

Participants in the Member-Directed Plan are not eligible for health care coverage offered to benefit recipients in the Traditional Pension Plan and Combined Plan. A portion of employer contributions for these participants is allocated to a retiree medical account (RMA). Upon separation or retirement, participants may be reimbursed for qualified medical expenses from these accounts.

An additional RMA was also established several years ago when three health care coverage levels were available to retirees. Monthly allowance amounts in excess of the cost of the retiree's selected coverage were notionally credited to the retiree's RMA. Retirees and their dependents could seek reimbursements from the RMA balances for qualified medical expenses. In 2013, the number of health care options available to retirees was reduced from three to one, eliminating the majority of deposits to the RMA. Wellness incentive payments were the only remaining deposits made to this RMA. Wellness incentives are no longer awarded starting with the 2017 plan year. These RMA balances were transferred to the HRA for retirees with both types of accounts. In addition, OPERS initiated an automatic claims payment process for reimbursements for retiree health care costs paid through pension deduction. This process will reimburse members for eligible health care premiums paid to OPERS, currently through pension deduction, up to the member's available RMA balance.

#### **OPEB FUNDING POLICY – OPERS**

The OPERS funding policy provides for periodic member and employer contributions to all three plans (Traditional Pension, Combined and Member-Directed) at rates established by the OPERS Board of Trustees, subject to limits set in statute. The rates established for member and employer contributions were approved based upon the recommendations of OPERS' external actuary. All contribution rates were within the limits authorized by the ORC.

Member and employer contribution rates, as a percent of covered payroll, were the same for each covered group across all three plans for the year ended Dec. 31, 2018. Within the Traditional Pension Plan and Combined Plan, member and employer contributions (employer contributions only for the Combined Plan) and an actuarially determined rate of return are adequate to accumulate sufficient assets to pay defined benefits when due. Member contributions within the Combined Plan are not used to fund the defined benefit retirement allowance. Employer contribution rates as a level percent of payroll dollars are determined using the entry

age actuarial funding method. This formula determines the amount of contributions necessary to fund: (1) the current service cost, representing the estimated amount necessary to pay for defined benefits earned by the members during the current service year; and (2) the prior service cost for service earned prior to the current year and subsequent benefit increases. These contributions represent the amount necessary to fund accrued liabilities for retirement allowances and survivor benefits over a period of time. The annual employer contributions reported for the Traditional Pension Plan for 2018 were \$1,895.5 million. Employer contributions for the Combined Plan for 2018 were \$60.2 million. Employers satisfied 100% of the contribution requirements.

The member and employer contribution rates for the State and Local divisions are currently set at the maximums authorized by the ORC of 10% and 14%, respectively. ORC Chapter 145 assigns authority to the OPERS Board to amend the funding policy. As of Dec. 31, 2018, the OPERS Board adopted the contribution rates that were recommended by the actuary. The contribution rates were included in a funding policy adopted by the Board in October 2013, and are certified periodically by the Board as required by the ORC.

As of Dec. 31, 2018, the date of the last pension actuarial study, the funding period for all defined benefits of OPERS was 27 years.

In 2019, OPERS allocated 0% of employer contributions towards health care. Therefore, OP&F's contractually required employer contributions to OPERS for OPEB funding was \$0.00 for fiscal year 2019.

### OPEB INVESTMENT POLICY

The allocation of investment assets within the Health Care portfolio as approved by the OPERS Board of Trustees as outlined in the annual investment plan. Assets are managed on a total return basis with a long-term objective of continuing to offer a sustainable health care program for current and future retirees. OPERS' primary goal is to achieve and maintain a fully funded status for benefits provided through the defined pension plans. Health care is a discretionary benefit. The table below displays the OPERS Board of Trustees' approved asset allocation policy for 2018 and the long-term expected real rate of return.

Asset Class	Target Allocation for 2018	Weighted Average Long-Term Expected Real Rate of Return (Arithmetic)
Fixed Income	34.00%	2.42%
Domestic Equities	21.00%	6.21%
REITs*	6.00%	5.98%
International Equities	22.00%	7.83%
Other Investments	17.00%	5.57%
<b>TOTAL</b>	<b>100.00%</b>	<b>5.16%</b>

\* Real Estate Investment Trusts (REITs).

The long-term expected rate of return on health care investment assets was determined using a building-block method in which best-estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected real rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adjusted for inflation.

During 2018, OPERS managed investments in three investment portfolios: the Defined Benefit portfolio, the Health Care portfolio and the Defined Contribution portfolio. The Health Care portfolio includes the assets for health care expenses for the Traditional Pension Plan, Combined Plan and Member-Directed Plan eligible members. Within the Health Care portfolio, contributions into the plans are assumed to be received continuously throughout the year based on the actual payroll payable at the time contributions are made, and health care-related payments are assumed to occur mid-year. Accordingly, the money-weighted rate of return is considered to be the same for all plans within the portfolio. The annual money-weighted rate of return expressing investment performance, net of investment expenses and adjusted for the changing amounts actually invested, for the Health Care portfolio was a loss of 5.60% for 2018.

### OPEB LIABILITIES (ASSETS), OPEB EXPENSE, AND DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES RELATED TO OPEB

The net OPEB liability was measured as of Dec. 31, 2018, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of that date. OP&F's proportionate share of the net OPEB liability was based on OP&F's portion of employer contributions to the pension plan. Gains and losses related to changes in total OPEB liability and fiduciary net position are recognized in OPEB expense systematically over time. Amounts are first recognized as deferred outflows and deferred inflows of resources related to OPEB and are to be recognized in future OPEB expense. The

recognition period differs depending on the source of the gain or loss: net difference between projected and actual earnings on OPEB plan investments are recognized over a five-year period; all other amounts are recognized over expected average remaining service lives of all plan members. The following is information relative to OPEB proportionate share and OPEB expense:

<b>OPERS</b>	<b>TOTAL</b>
OP&F's Proportionate Share of the Net OPEB Liability	\$(9,413,176)
OP&F's Proportion of the Net OPEB Liability	0.07220%
OP&F's OPEB Expense	\$1,124,143

<b>OPERS</b>	<b>TOTAL</b>
<b>Deferred Outflows of Resources</b>	
Differences between expected and actual experience	4,047
Net difference between projected and actual earnings on pension plan investments	\$469,813
Changes of Assumptions	378,286
Changes in proportion and differences	141,404
<b>TOTAL DEFERRED OUTFLOWS OF RESOURCES</b>	<b>\$993,550</b>

<b>Deferred Inflows of Resources</b>	
Differences between expected and actual experience	(28,461)
Changes of Assumptions	(267,371)
<b>TOTAL DEFERRED INFLOWS OF RESOURCES</b>	<b>(295,832)</b>

**OPERS – AMORTIZATION OF NET DEFERRED INFLOWS  
AND DEFERRED OUTFLOWS OF RESOURCES**

<b>OPERS</b>	<b>TOTAL</b>
Fiscal Year Ending Dec. 31:	
2020	\$257,884
2021	229,950
2022	9,594
2023	200,290
<b>TOTAL</b>	<b>\$697,718</b>

**OPEB DISCOUNT RATE – OPERS**

A single discount rate of 3.96% was used to measure the OPEB liability on the measurement date of Dec. 31, 2018. Projected benefit payments are required to be discounted to their actual present value using a single discount rate that reflects (1) long-term expected rate of return on OPEB plan investments (to the extent that the health care 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 are not met). This single discount rate was based on an expected rate of return on the health care investment portfolio of 6.0% and a municipal bond rate of 3.71%. The projection of cash flows used to determine this single discount rate assumed that employer contributions will be made at rates equal to the actuarially determined contribution rate. Based on these assumptions, the health care fiduciary net position and future contributions were sufficient to finance health care costs through 2031. As a result, the long-term expected rate of return on health care investments was applied to projected costs through the year 2031, and the municipal bond rate was applied to all health care costs after that date.

### SENSITIVITY OF OP&F'S PROPORTIONATE SHARE OF THE NET OPEB LIABILITY TO CHANGES IN THE DISCOUNT RATE

The following table presents the OPEB liability calculated using the single discount rate of 3.96%, and the expected net OPEB liability if it were calculated using a discount rate that is 1% lower, 2.96%, or 1% higher, 4.96%, than the current rate:

Sensitivity of OP&F's proportionate share of the Net OPEB Liability to changes in the discount rate	1% Decrease	Single Discount Rate	1% Increase
Discount Rate as of Dec. 31, 2018	2.96%	3.96%	4.96%
OPEB Plan	\$12,042,960	\$9,413,176	\$7,321,802

### SENSITIVITY TO OP&F'S PROPORTIONATE SHARE OF THE NET OPEB LIABILITY TO CHANGES IN THE HEALTH CARE COST TREND RATE

Retiree health care valuations use a health care cost-trend assumption that changes over several years built into the assumption. The near-term rates reflect increases in the current cost of health care; the trend starting in 2019 is 10.0%. If this trend continues the projection indicates that years from now virtually all expenditures will be for health care. A more reasonable alternative is that in the not-too-distant future, the health plan cost trend will decrease to a level at, or near, wage inflation. On this basis, the actuaries project premium rate increases will continue to exceed wage inflation for approximately the next decade, but by less each year, until leveling off at an ultimate rate, assumed to be 3.25% in the most recent valuation.

Changes in the health care cost trend rate may also have a significant impact on the net OPEB liability. The following table presents the net OPEB liability calculated using the assumed trend rates, and the expected net OPEB liability if it were calculated using a health care cost trend rate that is 1% lower, 9.0%, or 1% higher, 11.0%, than the current rate:

Sensitivity of OP&F's proportionate share of the Net OPEB Liability to changes in the health care cost trend rate	1% Decrease	Current Health Care Cost Trend Rate Assumption	1% Increase
As of Dec. 31, 2018			
OPEB Plan	\$9,048,104	\$9,413,176	\$9,833,640

### OPEB AVERAGE REMAINING SERVICE LIFE

GASB Statement No. 75 requires that changes arising from differences between expected and actual experience or from changes in actuarial assumptions be recognized in OPEB expense over the average remaining service lives of all employees provided with coverage through the health care plans (active and inactive). This is to consider these differences on a pooled basis, rather than an individual basis, to reflect the expected remaining service lives of the entire pool of employees with the understanding that inactive employees have no remaining service period. As of Dec. 31, 2018, the average of the expected remaining service lives of all employees calculated by OPERS' external actuaries was 3.0305 years.

### OPERS ACTUARIAL ASSUMPTIONS

Projections of health care costs for financial reporting purposes are based on the substantive plan and include the types of coverage provided at the time of each valuation and the historical pattern of sharing of costs between OPERS and plan members. The total OPERS liability was determined by an actuarial valuation as of Dec. 31, 2017, rolled forward to the measurement date of Dec. 31, 2018.

The actuarial valuation used the following actuarial assumptions applied to all prior periods included in the measurement in accordance with the requirements of GASB Statement No. 74:

### KEY METHODS AND ASSUMPTIONS USED IN VALUATION OF TOTAL OPEB LIABILITY

Actuarial Information	OPEB Plan
Valuation Date	Dec. 31, 2017
Rolled-Forward Measurement Date	Dec. 31, 2018
Experience Study	5-Year Period Ended Dec. 31, 2015
Actuarial Cost Method	Individual entry age normal
<b>Actuarial Assumptions</b>	
Single Discount Rate	3.96%
Investment Rate of Return	6.00%
Municipal Bond Rate	3.71%
Wage Inflation	3.25%
Projected Salary Increases	3.25%-10.75% (includes wage inflation at 3.25%)
Health Care Cost Trend Rates	10.0% initial, 3.25% ultimate in 2029

Pre-retirement mortality rates are based on the RP-2014 Employees mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates are based on the RP-2014 Health Annuitant mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Post-retirement mortality rates for disabled retirees are based on the RP-2014 Disabled mortality table for males and females, adjusted for mortality improvement back to the observation period base year of 2006. The base year for males and females was then established to be 2015 and 2010, respectively. Mortality rates for particular calendar year are determined by applying the MP-2015 mortality improvement scale to all of the above described tables.

## 15. SUBSEQUENT EVENT

The United States and the State of Ohio declared a state of emergency in March 2020 due to the COVID-19 pandemic. The financial impact of COVID-19 and the ensuing emergency measures may impact subsequent periods of the Ohio Police & Fire Pension Fund (OP&F). The OP&F's investment portfolio has incurred a significant decline in fair value at the end of the first quarter 2020, consistent with the general decline in financial markets. However, because the values of individual investments fluctuate with market conditions, and due to market volatility, the amount of losses that may be recognized in subsequent periods cannot be determined with half of the fiscal year remaining. In addition, the impact on the OP&F's future operating costs, revenues, and any recovery from emergency funding, either federal or state, cannot be estimated.

## REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)

### REQUIRED SUPPLEMENTARY PENSION INFORMATION

#### SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY \*

Total Pension Liability	Year Ending Dec. 31, 2019	Year Ending Dec. 31, 2018	Year Ending Dec. 31, 2017	Year Ending Dec. 31, 2016	Year Ending Dec. 31, 2015	Year Ending Dec. 31, 2014
Service Cost	\$343,991,701	\$331,600,261	\$289,911,106	\$273,592,476	\$267,624,727	\$262,846,976
Interest	1,741,126,879	1,663,040,537	1,623,441,004	1,570,560,385	1,519,848,287	1,472,778,463
Plan Changes	-	-	-	-	-	-
Differences Between Expected and Actual Experience	(421,664,871)	322,601,323	109,199,474	2,143,161	(21,544,278)	-
Changes in Assumptions	-	-	318,479,524	-	-	-
Benefit Payments, Including Refunds of Member Contributions	(1,394,027,927)	(1,314,608,496)	(1,256,254,446)	(1,187,020,466)	(1,170,476,866)	(1,126,154,321)
<b>NET CHANGE IN TOTAL PENSION LIABILITY</b>	<b>269,425,782</b>	<b>1,002,633,625</b>	<b>1,084,776,662</b>	<b>659,275,556</b>	<b>595,451,870</b>	<b>609,471,118</b>
TOTAL PENSION LIABILITY - BEGINNING	22,103,699,175	21,101,065,550	20,016,288,888	19,357,013,332	18,761,561,462	18,152,090,344
<b>TOTAL PENSION LIABILITY - ENDING (a)</b>	<b>\$22,373,124,957</b>	<b>\$22,103,699,175</b>	<b>\$21,101,065,550</b>	<b>\$20,016,288,888</b>	<b>\$19,357,013,332</b>	<b>\$18,761,561,462</b>
<b>Plan Fiduciary Net Position</b>						
Contributions - Employer	\$502,303,770	\$478,595,785	\$462,394,203	\$455,143,532	\$428,972,949	\$418,493,468
Contributions - Member	303,413,682	295,472,374	282,006,793	268,594,295	245,834,623	223,989,055
Net Investment Income	2,305,254,776	(458,734,784)	1,812,565,572	1,240,580,488	(11,259,198)	786,522,451
Benefit Payments, Including Refunds of Member Contributions	(1,394,027,927)	(1,314,608,496)	(1,256,254,446)	(1,187,020,466)	(1,170,476,866)	(1,126,154,321)
Administrative Expense	(21,410,301)	(16,234,396)	(19,487,358)	(18,851,765)	(15,635,762)	(15,480,687)
Other Changes	-	(7,047,680)	-	-	(6,940,426)	-
<b>NET CHANGES IN PLAN FIDUCIARY NET POSITION</b>	<b>1,695,534,000</b>	<b>(1,022,557,197)</b>	<b>1,281,224,764</b>	<b>758,446,084</b>	<b>(529,504,680)</b>	<b>287,369,966</b>
PLAN FIDUCIARY NET POSITION - BEGINNING	13,941,056,807	14,963,614,004	13,682,389,240	12,923,943,156	13,453,447,836	13,166,077,870
<b>PLAN FIDUCIARY NET POSITION - ENDING (b)</b>	<b>\$15,636,590,807</b>	<b>\$13,941,056,807</b>	<b>\$14,963,614,004</b>	<b>\$13,682,389,240</b>	<b>\$12,923,943,156</b>	<b>\$13,453,447,836</b>
<b>NET PENSION LIABILITY (SURPLUS) - ENDING (a)-(b)</b>	<b>\$6,736,534,150</b>	<b>\$8,162,642,368</b>	<b>\$6,137,451,546</b>	<b>\$6,333,899,648</b>	<b>\$6,433,070,176</b>	<b>\$5,308,113,626</b>
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	69.89%	63.07%	70.91%	68.36%	66.77%	71.71%
Covered Payroll	\$2,373,429,623	\$2,302,436,015	\$2,224,675,422	\$2,094,550,962	\$2,046,601,668	\$1,998,631,412
Net Pension Liability as a Percentage of Covered Payroll	283.83%	354.52%	275.88%	302.40%	314.33%	265.59%

\* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

**SCHEDULE OF EMPLOYERS' NET PENSION LIABILITY (ASSET) \***

Year Ending Dec. 31	(a) Total Pension Liability	(b) Plan Fiduciary Net Position	(a)-(b)=(c) Net Pension Liability (Surplus)	(b) / (a) Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	(d) Covered Payroll	(c) / (d) Net Pension Liability (Surplus) as a Percentage of Covered Payroll
2019	\$22,373,124,957	\$15,636,590,807	\$6,736,534,150	69.89%	\$2,373,429,623	283.83%
2018	22,103,699,175	13,941,056,807	8,162,642,368	63.07%	2,302,436,015	354.52%
2017	21,101,065,550	14,963,614,004	6,137,451,546	70.91%	2,224,675,422	275.88%
2016	20,016,288,888	13,682,389,240	6,333,899,648	68.36%	2,094,550,962	302.40%
2015	19,357,013,332	12,923,943,156	6,433,070,176	66.77%	2,046,601,668	314.33%
2014	18,761,561,462	13,453,447,836	5,308,113,626	71.71%	1,998,631,412	265.59%
2013	18,152,090,344	13,166,077,870	4,986,012,474	72.53%		

\* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

**SCHEDULE OF EMPLOYER CONTRIBUTIONS - PENSION TRUST FUND \***

Year Ended Dec. 31	(a) Statutorily Due Employer Contributions	(b) Actual Employer Contributions	(a)-(b)=(c) Contribution Deficiency (Excess)	(d) Covered Payroll *	(a) / (d) Contributions as a Percentage of Covered Payroll
2019	\$502,043,282	\$502,043,282	\$-	\$2,218,017,387	22.63%
2018	478,294,974	478,294,974	-	2,209,258,449	21.65%
2017	462,047,728	462,047,728	-	2,180,910,604	21.19%
2016	454,745,371	454,745,371	-	2,060,850,564	22.07%
2015	428,526,214	428,526,214	-	1,986,568,535	21.57%
2014	417,993,316	417,993,316	-	1,942,269,436	21.52%
2013	349,461,765	349,461,765	-	1,913,382,667	18.26%
2012	286,752,750	286,752,750	-	1,897,413,344	15.11%
2011	278,175,108	278,175,108	-	1,868,502,282	14.89%
2010	285,251,945	285,251,945	-	1,895,195,693	15.05%

\* Actuarial Estimate

**SCHEDULE OF INVESTMENT RETURNS \***

	2019	2018	2017	2016	2015	2014
Annual Money Weighted Rate of Return, Net of Investment Expenses	17.279%	(2.854)%	13.867%	10.048%	0.187%	6.540%

\* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

## NOTES TO REQUIRED SUPPLEMENTARY PENSION INFORMATION

### 1. SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY

The total pension liability contained in this schedule was provided by OP&F's actuary, Cavanaugh Macdonald Consulting. The net pension liability is measured as the total pension liability less the amount of OP&F's fiduciary net position.

### 2. SCHEDULE OF EMPLOYER CONTRIBUTIONS

The required employer contributions and percent of those contributions actually made are presented in this schedule.

### 3. ACTUARIAL ASSUMPTIONS

The valuation was based on the actuarial assumptions and methods that have been adopted by the Board of Trustees, including a valuation interest rate of 8.00% per annum compounded annually. The assumptions were effective Jan. 1, 2017, and recommended by the actuary based on a five-year experience review covering the period 2012 through 2016.

The information presented in the required supplementary schedules was used in the actuarial valuation for purposes of calculating the actuarially determined contribution rate. The assumptions and methods used for this actuarial valuation were recommended by the actuary and adopted by the Board of Trustees. Additional information as of the latest actuarial valuation follows.

## DEFINED BENEFIT PLAN – PENSION TRUST FUND

### ACTUARIAL ASSUMPTIONS

Valuation date	Jan. 1, 2019
Actuarial cost method	Entry age
Amortization method	Level percent of payroll, open
Amortization period	30 years
Asset valuation method	4-year adjusted fair value with a corridor of 20% of the fair value.
Investment rate of return	8.00%
Projected salary increases	3.75% - 10.50%
Payroll increases	3.25%
Inflation assumptions	2.75%
Cost-of-living adjustments	2.20% and 3.00% simple

## REQUIRED SUPPLEMENTARY OPEB INFORMATION (UNAUDITED)

### SCHEDULE OF CHANGES IN NET OPEB LIABILITY AND RELATED RATIOS\*

Total OPEB Liability	Year Ending Dec. 31, 2019	Year Ending Dec. 31, 2018	Year Ending Dec. 31, 2017
Service Cost	\$43,042,991	\$269,913,915	\$230,753,065
Interest	79,675,059	220,193,164	220,886,126
Changes of Benefit Terms	-	(4,945,194,650)	-
Differences Between Expected and Actual Experience	(99,155,482)	-	(32,754,010)
Changes in Assumptions	214,763,191	(293,714,580)	633,696,010
Net Benefit Payments	(76,303,134)	(144,706,189)	(103,062,283)
NET CHANGE IN TOTAL OPEB LIABILITY	162,022,625	(4,893,508,340)	949,518,908
TOTAL OPEB LIABILITY - BEGINNING	1,704,439,395	6,597,947,735	5,648,428,827
<b>TOTAL OPEB LIABILITY - ENDING (a)</b>	<b>\$1,866,462,020</b>	<b>\$1,704,439,395</b>	<b>\$6,597,947,735</b>
<b>Plan Fiduciary Net Position</b>			
Contributions - Employer	\$11,973,144	\$11,337,852	\$18,894,974
Net Investment Income	149,595,598	(4,191,504)	115,417,360
Benefit Payments	(76,303,134)	(144,706,189)	(103,062,283)
Administrative Expenses	(362,607)	(741,952)	(815,977)
Other	-	-	-
NET CHANGE IN PLAN FIDUCIARY NET POSITION	84,903,001	(138,301,793)	30,434,074
PLAN FIDUCIARY NET POSITION - BEGINNING	793,785,996	932,087,789	901,653,715
<b>PLAN FIDUCIARY NET POSITION - ENDING (b)</b>	<b>\$878,688,997</b>	<b>\$793,785,996</b>	<b>\$932,087,789</b>
NET OPEB LIABILITY (SURPLUS) - ENDING (a)-(b)	\$987,773,023	\$910,653,399	\$5,665,859,946
Plan Fiduciary Net Position as a Percentage of the total OPEB Liability	47.08%	46.57%	14.13%
Covered Payroll	\$2,373,429,623	\$2,302,436,015	\$2,180,910,604
Net OPEB Liability as a Percentage of Covered Payroll	41.62%	39.55%	259.79%

\* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

### SCHEDULE OF NET OPEB LIABILITY (ASSET)\*

Year Ending Dec. 31	(a) Total OPEB Liability	(b) Plan Fiduciary Net Position	(a)-(b)=(c) Net OPEB Liability (Surplus)	(b) / (a) Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	(d) Covered Payroll	(c) / (d) Net OPEB Liability (Surplus) as a Percentage of Covered Payroll
2019	\$1,866,462,020	\$878,688,997	\$987,773,023	47.08%	\$2,373,429,623	41.62%
2018	1,704,439,395	793,785,996	910,653,399	46.57%	2,302,436,015	39.55%
2017	6,597,947,735	932,087,789	5,665,859,946	14.13%	2,180,910,604	259.79%

\* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

**SCHEDULE OF EMPLOYER CONTRIBUTIONS - RETIREE HEALTH CARE TRUST FUND**

Year Ended Dec. 31	(a) Statutorily Due Employer Contributions	(b) Actual Employer Contributions	(a)-(b)=(c) Contribution Deficiency (Excess)	(d) Covered Payroll *	(a) / (d) Contributions as a Percentage of Covered Payroll
2019	\$11,973,144	\$11,973,144	\$-	\$2,218,017,387	0.54%
2018	11,337,852	11,337,852	-	2,209,258,449	0.51%
2017	10,871,479	10,871,479	-	2,180,910,604	0.50%
2016	10,708,739	10,708,739	-	2,060,850,584	0.52%
2015	10,211,723	10,211,723	-	1,986,568,535	0.51%
2014	9,895,274	9,895,274	-	1,942,269,436	0.51%
2013	68,720,879	68,720,879	-	1,913,382,667	3.59%
2012	130,285,935	130,285,935	-	1,897,413,344	6.87%
2011	129,297,720	129,297,720	-	1,868,502,282	6.92%
2010	128,774,894	128,774,894	-	1,895,195,693	6.79%

\* Actuarial Estimate.

**SCHEDULE OF INVESTMENT RETURNS \***

	2019	2018	2017	2016	2015	2014
Annual Money Weighted Rate of Return, Net of Investment Expenses	17.279%	(2.854)%	13.867%	10.048%	0.187%	6.540%

\* Schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

## NOTES TO REQUIRED SUPPLEMENTARY OPEB INFORMATION

### 1. SCHEDULE OF CHANGES IN THE EMPLOYERS' NET OPEB LIABILITY

The total OPEB liability contained in this schedule was provided by OP&F's actuary, Cavanaugh Macdonald Consulting. The net OPEB liability is measured as the total OPEB liability less the amount of OP&F's fiduciary net position.

### 2. SCHEDULE OF EMPLOYER CONTRIBUTIONS

The required employer contributions and percent of those contributions actually made are presented in this schedule.

### 3. ACTUARIAL ASSUMPTIONS

The valuation was based on the actuarial assumptions and methods that have been adopted by the Board of Trustees, including a valuation interest rate of 8.00% per annum compounded annually. The assumptions were effective Jan. 1, 2017, and recommended by the actuary based on a five-year experience review covering the period 2012 through 2016. The information presented in the required supplementary schedules was used in the actuarial valuation for purposes of calculating the actuarially determined contribution rate. The assumptions and methods used for this actuarial valuation were recommended by the actuary and adopted by the Board of Trustees. Additional information as of the latest actuarial valuation follows.

### RETIREE HEALTH CARE BENEFITS – HEALTH CARE TRUST FUND

#### ACTUARIAL ASSUMPTIONS

Valuation date	Jan. 1, 2019
Actuarial cost method	Entry age
Amortization method	Level percent of payroll, open
Amortization period	30 years
Asset valuation method	Fair value
Investment rate of return	8.00%
Projected salary increases	3.75% - 10.50%
Payroll increases	3.25%
Inflation assumptions	2.75%

## OPERS RELATED REQUIRED SUPPLEMENTARY PENSION INFORMATION

### SCHEDULE OF OP&F'S PROPORTIONATE SHARE OF THE NET PENSION LIABILITY OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - TRADITIONAL PENSION PLAN LAST 10 FISCAL YEARS \*

	2019	2018	2017	2016	2015
OP&F's proportion of the net pension liability (asset)	\$17,148,431	\$9,597,642	\$13,874,911	\$10,779,540	\$7,534,305
OP&F's proportionate share of the net pension liability (asset)	0.063%	0.061%	0.061%	0.062%	0.062%
OP&F's covered payroll	\$8,457,043	\$7,507,300	\$7,290,938	\$7,745,508	\$7,649,967
OP&F's proportionate share of the net pension liability (asset) as a percentage of its covered payroll	202.77%	127.84%	190.30%	139.17%	98.49%
Plan fiduciary net position as a percentage of the total pension liability	74.70%	84.66%	77.25%	81.08%	86.45%

### SCHEDULE OF OP&F'S PROPORTIONATE SHARE OF THE NET PENSION LIABILITY OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - COMBINED PENSION PLAN LAST 10 FISCAL YEARS \*

	2019	2018	2017	2016	2015
OP&F's proportion of the net pension liability (asset)	\$(139,322)	\$(175,453)	\$(69,235)	\$(63,275)	\$(52,363)
OP&F's proportionate share of the net pension liability (asset)	0.125%	0.129%	0.124%	0.130%	0.136%
OP&F's covered payroll	\$532,871	\$490,143	\$446,969	\$473,208	\$478,275
OP&F's proportionate share of the net pension liability (asset) as a percentage of its covered payroll	(26.15)%	(35.80)%	(15.49)%	(13.37)%	(10.95)%
Plan fiduciary net position as a percentage of the total pension liability	126.64%	137.28%	116.55%	116.90%	114.83%

### SCHEDULE OF OP&F'S PROPORTIONATE SHARE OF THE NET PENSION LIABILITY OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - MEMBER DIRECTED PLAN LAST 10 FISCAL YEARS \*

	2019	2018	2017	2016	2015
OP&F's proportion of the net pension liability (asset)	\$(5,909)	\$(8,942)	\$(1,011)	\$(837)	\$(1,441)
OP&F's proportionate share of the net pension liability (asset)	0.259%	0.256%	0.243%	0.219%	0.245%
OP&F's covered payroll	\$1,058,871	\$1,002,986	\$900,093	\$1,045,000	\$1,076,864
OP&F's proportionate share of the net pension liability (asset) as a percentage of its covered payroll	(0.56)%	(0.89)%	(0.11)%	(0.08)%	(0.13)%
Plan fiduciary net position as a percentage of the total pension liability	113.42%	124.46%	103.40%	103.91%	N/A

\* The amounts presented were determined as of Dec. 31 of the prior calendar year. GASB 68 was implemented in 2015. This schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

**SCHEDULE OF CONTRIBUTIONS  
OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - TRADITIONAL PENSION PLAN  
LAST 10 FISCAL YEARS \***

	2019	2018	2017	2016	2015
Contractually required contributions	\$1,183,986	\$1,051,022	\$947,822	\$929,461	\$917,996
Contributions in relation to the contractually required contributions	\$1,183,986	\$1,051,022	\$947,822	\$929,461	\$917,996
Contribution deficiency (excess)	\$-	\$-	\$-	\$-	\$-
OP&F's covered payroll	\$8,457,043	\$7,507,300	\$7,290,938	\$7,745,508	\$7,649,967
Contributions as a percentage of covered payroll	14%	14%	13%	12%	12%

**SCHEDULE OF CONTRIBUTIONS  
OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - COMBINED PENSION PLAN  
LAST 10 FISCAL YEARS \***

	2019	2018	2017	2016	2015
Contractually required contributions	\$74,602	\$68,620	\$58,106	\$56,785	\$57,393
Contributions in relation to the contractually required contributions	\$74,602	\$68,620	\$58,106	\$56,785	\$57,393
Contribution deficiency (excess)	\$-	\$-	\$-	\$-	\$-
OP&F's covered payroll	\$532,871	\$490,143	\$446,969	\$473,208	\$478,275
Contributions as a percentage of covered payroll	14%	14%	13%	12%	12%

**SCHEDULE OF CONTRIBUTIONS  
OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - MEMBER DIRECTED PLAN  
LAST 10 FISCAL YEARS \***

	2019	2018	2017	2016	2015
Contractually required contributions	\$148,242	\$140,418	\$126,013	\$146,300	\$150,761
Contributions in relation to the contractually required contributions	\$148,242	\$140,418	\$126,013	\$146,300	\$150,761
Contribution deficiency (excess)	\$-	\$-	\$-	\$-	\$-
OP&F's covered payroll	\$1,058,871	\$1,002,986	\$900,093	\$1,045,000	\$1,076,864
Contributions as a percentage of covered payroll	14%	14%	14%	14%	14%

\* The amounts presented were determined as of Dec. 31 of the prior calendar year. GASB 68 was implemented in 2015. This schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

## OPERS RELATED REQUIRED SUPPLEMENTARY OPEB INFORMATION

### SCHEDULE OF OP&F'S PROPORTIONATE SHARE OF THE NET OPEB LIABILITY OHIO PUBLIC EMPLOYEES RETIREMENT PLAN - OPEB PLAN LAST 10 FISCAL YEARS \*

	2019	2018	2017
OP&F's proportion of the net OPEB liability (asset)	\$9,413,176	\$7,679,441	\$7,047,680
OP&F's proportionate share of the net OPEB liability (asset)	0.072%	0.071%	0.070%
OP&F's covered payroll**	\$8,989,914	\$7,997,443	\$7,737,907
OP&F's proportionate share of the net OPEB liability (asset) as a percentage of its covered payroll	104.71%	96.02%	91.08%
Plan fiduciary net position as a percentage of the total OPEB liability	46.33%	54.14%	54.05%

### SCHEDULE OF OPEB CONTRIBUTIONS OHIO PUBLIC EMPLOYEES RETIREMENT PLAN LAST 10 FISCAL YEARS \*

	2019	2018	2017
Contractually required contributions**	\$-	\$-	\$77,379
Contributions in relation to the contractually required contributions**	\$-	\$-	\$77,379
Contribution deficiency (excess)	\$-	\$-	\$-
OP&F's covered payroll**	\$8,989,914	\$7,997,443	\$7,737,907
Contributions as a percentage of covered payroll	-%	-%	1%

\* The amounts presented were determined as of Dec. 31 of the prior calendar year. GASB 75 was implemented in 2018. This schedule is intended to show information for 10 years. Additional years will be displayed as they become available.

\*\* Excludes contributions and covered payroll related to OPERS - Member Directed Plan.

## ADDITIONAL INFORMATION

### SCHEDULE OF ADMINISTRATIVE EXPENSES \*

For the year ended Dec. 31, 2019

<b>Personnel Services</b>	Salaries and Wages	\$11,227,301
	OPERS Contributions	5,207,356
	Insurance	3,058,280
	Fringe Benefits/Employee Recognition	11,118
	Tuition Reimbursement	31,806
	<b>TOTAL PERSONNEL SERVICES</b>	<b>19,535,861</b>
<b>Professional Services</b>	Actuarial	288,234
	Audit	184,473
	Custodial Banking Fees	811,482
	Investment Fees and Consulting	49,935,329
	Other Consulting (Disability, Software, Legal and Health Care)	1,322,857
	Banking Expense	83,717
	<b>TOTAL PROFESSIONAL SERVICES</b>	<b>52,626,092</b>
<b>Communications Expense</b>	Printing and Postage	277,559
	Telephone	60,358
	Member/Employer Education	12,642
	Other Communications	87,000
	<b>TOTAL COMMUNICATIONS EXPENSE</b>	<b>437,559</b>
<b>Other Operating Expense</b>	Conferences and Education	88,642
	Travel	84,632
	Computer Technology	985,033
	Other Operating	768,583
	Warrant Clearing	338
	ORSC Expense	48,637
	Depreciation Expense - Capital	1,103,638
	<b>TOTAL OTHER OPERATING EXPENSES</b>	<b>3,079,503</b>
<b>NET BUILDING EXPENSES (includes rent)</b>		<b>1,329,394</b>
<b>TOTAL OPERATING EXPENSES</b>		<b>77,008,409</b>
<b>INVESTMENT EXPENSES</b>		<b>(55,396,338)</b>
<b>NET ADMINISTRATIVE EXPENSES</b>		<b>\$21,612,071</b>

\* Includes investment related administrative expenses.

### SCHEDULE OF INVESTMENT EXPENSES\*\*

Category	2019
Investment Manager Services	\$48,385,109
Custodial Banking Fees	811,482
Other Professional Services	1,550,220
Other Direct Investment Expenses	2,439,375
Allocation of Other Administrative Expenses	2,210,152
<b>INVESTMENT EXPENSES</b>	<b>\$55,396,338</b>

\*\* A portion of the non-Investment Department administrative expenses is allocated to Investment Expense based on the ratio of investment staff to total OP&amp;F staff.

## COMBINING STATEMENT OF CHANGES IN ASSETS AND LIABILITIES - PUBLIC SAFETY OFFICERS DEATH BENEFIT FUND

### PUBLIC SAFETY OFFICERS DEATH BENEFIT FUND FOR THE YEAR ENDING DEC. 31, 2019

	Balance Dec. 31, 2018	Additions	Subtractions	Balance Dec. 31, 2019
<b>Assets:</b>				
Cash and Short-term Investments	\$211,025	\$32,700,000	\$31,732,118	\$1,178,907
<b>TOTAL ASSETS</b>	<b>211,025</b>	<b>32,700,000</b>	<b>31,732,118</b>	<b>1,178,907</b>
<b>Liabilities:</b>				
Due to State of Ohio	211,025	32,700,000	31,732,118	1,178,907
<b>TOTAL LIABILITIES</b>	<b>\$211,025</b>	<b>\$32,700,000</b>	<b>\$31,732,118</b>	<b>\$1,178,907</b>

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# INVESTMENTS

2019 COMPREHENSIVE ANNUAL  
FINANCIAL REPORT

**INVESTMENT REPORT**

**INVESTMENT PORTFOLIO SUMMARY**

**TEN LARGEST COMMON STOCKS**

**TEN LARGEST BONDS AND OBLIGATIONS**

**TEN LARGEST REAL ESTATE HOLDINGS**

**SCHEDULE OF INVESTMENT RESULTS**

**INVESTMENT CONSULTANTS AND MONEY MANAGERS**

**SCHEDULE OF BROKERS' FEES PAID**

**INVESTMENT POLICY AND GUIDELINES**

# INVESTMENT REPORT (PREPARED THROUGH A COMBINED EFFORT WITHIN THE INVESTMENT DEPARTMENT)

## INTRODUCTION

The investment authority of OP&F is specified in Chapter 742 of the ORC. Importantly, the ORC requires that the Board of Trustees and other fiduciaries discharge their duties solely in the interest of the participants and beneficiaries, for the exclusive purpose of providing benefits to participants and their beneficiaries and defraying reasonable expenses of administering OP&F. Within the guidelines of the ORC, OP&F has developed an Investment Policy and Guideline statement that provides for appropriate diversification of assets and an acceptable expected return on investments after consideration of investment risks. Investment performance returns are prepared by Wilshire Associates. Investment activities are presented on a trade date basis and measurements are calculated using time weighted rates of return consistent with investment industry standards.

## SIGNIFICANT DEVELOPMENTS IN 2019

Since the adoption of a new long-term asset allocation policy in 2017, OP&F turned to reviewing the investment structures of several asset classes in 2018 and 2019. In 2018, new investment structures were adopted for both U.S. and Non-U.S. equity, and in 2019, for core fixed income and high yield. In core fixed income, an investment mandate was terminated that no longer aligned with the allocation's goals and those assets were targeted for redistribution to existing investment managers. In addition, implementation of core fixed income leverage, in connection with an implementation plan adopted in 2017, would begin in 2020 and be calendar based unless the 10-year Treasury bond increases to a pre-defined trigger point at which time implementation would accelerate. The new structure improves the expected return for the core fixed income allocation given lower overall fees. For high yield, the new structure called for reducing the number of mandates from four to three and changing the target weights of the remaining mandates, which improves the expected information ratio for the allocation. Other significant accomplishments in 2019 included widening the upper band for cash from 0.5% to 3.0% to address practical and operational needs as well as to allow for defensive tactical positioning. In conjunction, the rebalancing range for total safety oriented assets, which includes cash and core fixed income, widened from + 2.3% to -2.3%/+ 5.3%. Along with adoption of new investment structures for both core fixed income and high yield and widening the bands for cash and total safety oriented assets, other significant noteworthy investment endeavors and issues addressed last year include the following:

- Worked toward long-term asset allocation targets by rebalancing between overweight/underweight asset classes.
- Amended OP&F's Investment Policy and Guidelines statement.

- Amended OP&F's Proxy Voting Policy.
- Amended OP&F's Short-Term Cash Management Investment Guidelines.
- Amended OP&F's Derivatives Policy Statement.
- Changed the benchmark for the Midstream Energy Infrastructure (formerly Master Limited Partnerships (MLP)) asset class and respective investment managers from Alerian MLP Index to Alerian Midstream Energy Index. In conjunction, amended investment manager guidelines for Tortoise Capital Advisors, Salient Capital Advisors and Harvest Fund Advisors.
- Approved the 2019 private markets investment plan.
- Implemented the 2019 private markets investment plan:
  - Made commitments to Advent International IX, Cortec VII, Odyssey VI, TA XIII, Trident VII and Veritas VII.
- Approved TorreyCove's co-investment proposal.
- Amended OP&F's Private Credit Investment Policy.
- Approved the 2019 private credit investment plan.
- Continued to work toward target allocation to private credit:
  - Made commitments to Annaly Credit Opportunities Fund, Blackrock Direct Lending Fund IX and GSO European Senior Debt Fund II.
- Approved the 2019 real assets investment plan mid-year update.
- Continued to work toward target allocation to real assets:
  - Made a commitment to Brookfield Infrastructure Fund IV.
- Reviewed OP&F's Real Assets Investment Policy for possible changes.
- Reviewed OP&F's Real Estate Investment Policy for possible changes.
- Approved the 2019 real estate investment plan mid-year update .
- Approved the 2019 real estate open-end fund rebalancing review:
  - Approved partial redemptions for JP Morgan Strategic Property Fund, Heitman America Real Estate Trust and USAA Eagle Real Estate Fund.
  - Turned on the dividend reinvestment plans for Morgan Stanley PRIME Property Fund and LaSalle Property Fund.
- Continued to work toward target allocation in real estate:
  - Made commitments to Black Creek Industrial Fund and Exeter Industrial Fund V.

## ECONOMIC ENVIRONMENT

In the U.S., the economy's positive momentum continued at a moderate but steady pace as the expansion entered its eleventh year and became the longest on record. Real Gross Domestic Product (GDP) increased 2.3% in 2019 compared with an increase of 2.9% in 2018. Quarterly GDP gains, on average, slowed a bit from 2018's pace but remained steady. Payroll employment continued to grow at a healthy but slightly reduced pace in 2019, averaging 178,000 per month. The U.S. unemployment rate maintained its steady decline into September when it hit 3.5%, its lowest level since 1969, and after a brief tick higher returned to end the year at 3.5%. Both wage gains and consumer spending rose at a modest pace. The annual rate of U.S. inflation as measured by the Consumer Price Index stayed at or below 2.0% until October before nudging higher to end 2019 with a year-over-year increase of 2.3%. Still, the Federal Reserve's (Fed) preferred inflation measure, personal consumption expenditures, moved back below 2.0% last year, which was lower than in 2018. Consumer confidence stayed at a very high level throughout the year. As the year concluded, risks to the growth outlook seemed to be receding as trade policy tensions were diminishing and overseas growth appeared to be stabilizing.

In early January, the Fed began signaling they would place their ongoing federal funds rate tightening on hold and would also end their balance sheet wind down later in 2019. This shift was clearly in response to signs of economic strains and the market distress that played out in December on the heels of the Fed's third and fourth tightening moves of 2018. The Fed became data-dependent and in response to a softer economic outlook and subdued inflation, the Federal Open Market Committee (FOMC) lowered the federal funds rate three times during the second half of 2019. Overall, the FOMC cut the funds rate by a total of 75 basis points (bps), dropping it to a range of 1.5% to 1.75% in October. From there, the Fed returned to its data-dependent approach to determine the appropriate funds rate.

After slowing in 2018, foreign economic growth fell further early in 2019, troubled by trade tensions between the U.S. and China and the related downturn in global manufacturing. Asian economies suffered noticeably, given their linkages to China, and many Latin American economies continued to swoon. Economic activity weakened in several advanced foreign economies as well. However, financial conditions overseas eased in the second half of last year, helped by supportive actions of central banks and progress on the U.S.–China trade negotiations and reduced risks of a disruptive Brexit. In many advanced foreign economies, long-term interest rates stayed below their 2018 levels. Economic indicators in early 2020 began pointing to the global slowdown in manufacturing and trade nearing an end, and consumer spending and services activity around the world continued to hold up. In China and the euro area, data through early 2020 suggested that

growth was stabilizing. However, the biggest story in decades was about to emerge in China in the form of the coronavirus. In response to this and amid subsequent weakening economic activity and non-existent inflation pressures, foreign central banks generally adopted a more accommodative policy stance.

The United States economy entered 2020 on steady footing. Through February, payroll growth remained firm, the unemployment rate stayed low as did inflation. However, the world was literally about to change. What has happened in the past two months almost renders the prior year meaningless. It certainly, at a minimum, erased what was in 2019 a great year and turned all attention to the immediate future. In response to the global COVID-19 pandemic, vast swaths of the world economy were suddenly shut down. The economic and human damage inflicted harkens back to the Great Depression. Words such as “unprecedented,” “historic” and “unimaginable” are sprinkled liberally and accurately throughout most of the commentary on today's environment. Initial unemployment claims, which had been hovering in the low 200 thousands, surged to 3.3 million in late March and then rose to 6.9 and 6.6 million in subsequent weeks. The March employment report began to reflect this grim news with job losses of 881,000 and an unemployment rate of 4.4%. April's unemployment rate soared to 14.7%, the highest since the 1940s, with an unprecedented 20.5 million lost jobs, which is a record dating back to 1939, and these numbers are widely believed to be misstated to the low side. Meanwhile, the CPI fell back to a 1.5% annual rate in February before tumbling to 0.3% in March as deflationary pressures began to take hold. First quarter GDP has been initially reported to have fallen by a 4.8% annual rate. In response to this crisis, the Fed and the federal government both sprang into action. On March 3, the FOMC made an emergency cut of the federal funds rate by 50 bps to a range of 1.00% to 1.25% and followed that up on March 15 by returning federal funds to the zero bound, i.e., 0% to 0.25%. The Fed also announced and has begun implementing a number of measures aimed at keeping credit flowing through the financial system. The Fed removed the cap on its ongoing quantitative easing program and has already added more than \$2 trillion to its balance sheet. The Fed also began buying commercial paper, including municipal debt. In early April, the Fed announced a \$2.3 trillion lending program that will extend credit to banks that issue Paycheck Protection Program loans, purchase up to \$600 billion in loans issued through the Main Street program to medium-sized firms. The moves also will allow the Fed to buy corporate bonds from “fallen angels” that were downgraded into the upper tier of junk bond status, and a \$500 billion program to buy bonds from state and municipal governments. For its part, the federal government enacted the Coronavirus Aid, Relief, and Economic Security (CARES) Act, a

\$2 trillion bill meant to keep businesses and individuals afloat during an unprecedented freeze on the majority of American life. The bill impacts: individuals, small businesses, large corporations, hospitals and public health, federal safety net, state and local governments, and education. Other follow-on bills in the trillions of dollars are under discussion and negotiation within and between Congress and the administration.

## TOTAL FUND

The total portfolio, on a trade date basis, was valued at \$16.48 billion at the end of 2019, up from \$14.70 billion at the end of 2018. Within OP&F's portfolio, very strong absolute returns in U.S. and non-U.S. equity along with solid mid-teens returns from private markets, high yield, Treasury Inflation Protected Securities (TIPS), midstream energy and private credit and high single-digit results from real estate, fixed income and real assets all combined to deliver a solid total portfolio return in 2019. For calendar year 2019, the total portfolio's investment return was 17.89% gross of fees, 17.23% net of fees, compared to a policy index return of 16.32%. This represents an outperformance of the total portfolio's policy index by 157 bps gross and 91 bps net. OP&F's investments in U.S. and non-U.S. equity, private markets, private credit, TIPS, real estate and real assets all outperformed their respective asset class benchmarks over the course of 2019. Also, in its first full year, the derivatives overlay strategy managed by Russell Investments added an absolute 49 bps to the total fund performance.

Last year's strong absolute performance did not, however, translate into strong relative peer group performance as OP&F's relatively lighter exposure to public equity pulled down the peer group ranking to the 57th percentile of Wilshire's Master Trusts – All Plans Universe. With 2019's result, OP&F's three-year annualized gross of fees return now stands at 9.80%, and 9.16% net, while the five-year annualized gross of fees return is 8.16%, and 7.54% net. OP&F's 10-year gross of fees return is 9.75%, and 9.21% net. The 2019 results versus the policy index still kept OP&F's three-year relative return above the policy index return of 8.31% for the same period, while OP&F's five-year return also beat the policy return of 6.76%. The 10-year return also bested the policy return of 8.42%. As mentioned earlier, the total portfolio's 2019 results ranked in the 57th percentile of Wilshire's Master Trusts – All Plans Universe, while the three-year, five-year and 10-year results ranked in the 36th, 7th and 4th percentiles, respectively, of that same peer universe.

Through the first quarter of 2020, in response to the economic sudden stop caused by the global pandemic and compounded by an unexpected oil price war, OP&F's investments in all public markets asset classes, except core fixed income, have posted negative absolute returns. OP&F's U.S. and international

equity manager composites have fallen more than 23% and 26%, respectively. Even though, OP&F's portfolio is structured to be relatively light in public equities, the oil market shock inflicted enormous damage on the midstream energy portfolio. The midstream energy allocation has been extraordinarily disappointing as it nosedived more than 46% as the price of oil fell 66% for the quarter. To cap off the public markets composites, OP&F's high yield managers' composite return is down 11.8%, the TIPS manager is down more than 3% and the core fixed income managers eked out a barely positive 0.27% for the quarter. While short term, time-weighted performance is not the best measure for private asset classes, to be consistent in this context, real estate is up 2.3%, while real assets is up 1.5%, private equity is up over 4.0% and private credit fell by 0.2%. Lastly, the derivatives overlay strategy has added an absolute 16 bps to the total fund performance through March. Overall, OP&F's unaudited year-to-date return through March 31, 2020 of negative 13.76% is trailing its benchmark's return of negative 11.21%. After such a disappointing start to the year, OP&F's 2020 full year results, like so many others, will be linked to when and how successfully the U.S. and other countries are able to reopen their economies and get their people back to work. On a somewhat encouraging note, for the month of April 2020, the S&P 500 bounced back with a 12.8% return, the MSCI ACWI ex-U.S. Index had a 7.7% return and the Alerian Midstream Energy Index bounced back with a 29.5% return.

In mid-2017, OP&F adopted an updated asset allocation policy, which included a series of transitional policy benchmarks and asset class targets that laid out a roadmap to reach the new asset allocation benchmark over the course of several years. New target weights for each asset class kick in on Jan. 1 and July 1 each year. Generally, these six-month steps are de-risking the portfolio but in a risk parity sense. Equity and equity-like, e.g. high yield, exposures continue to be slowly reduced as core fixed income, real assets and private credit exposures are ramping up. The increasing fixed income exposures include a 2x levered U.S. inflation protected securities mandate, which is currently at 9.0% nominal (18.0% notional) versus its 8.5% nominal (17.0% notional) target, and the conversion of traditional core fixed income into a 2x levered core fixed income mandate. The implementation of core fixed income leverage has been converted to calendar based triggers with 0.25x added at the start of each quarter beginning with second quarter 2020. Additionally, OP&F has shifted implementation of the core fixed income leverage component entirely to Russell Investments, who will use Treasury futures to ramp up leverage in the coming year. Currently, core fixed income leverage is at the 1.25x target.

The Board of Trustees and staff believe that a well-diversified portfolio will serve OP&F well over the long-term. As mentioned in prior reports, the Board of Trustees' 2010

adoption of risk parity at the asset allocation level and their ongoing reaffirmation and implementation of that approach demonstrate that OP&F is committed to creating and maintaining a well-diversified portfolio. A combination of reduced equity and equity-like exposures inherent in risk parity, along with a generally rising stock market and tightening credit spreads over the past several years, have kept equities and high yield above their allocation targets; thus, making them a natural source of funds to diversify into rising target allocations for fixed income and alternatives exposures. This ongoing shift out of equity and equity-like exposures has generally kept OP&F from any forced rebalancing efforts, but staff closely monitors the portfolio's status relative to asset class allocation ranges and occasional periods of extreme valuation. In addition to forcing OP&F to sell high and buy low, a disciplined rebalancing policy removes human emotion from the decision making process. As evident in the Board of Trustee's risk parity approach and asset class structure decisions, OP&F has and will continue to evaluate non-correlated, non-traditional strategies and asset classes in its search for optimal risk-adjusted returns.

## EQUITIES – U.S. AND NON-U.S.

Equity returns in 2019 were solid virtually across the globe. U.S. stock returns for the calendar year were 31.02% as measured by the Wilshire 5000 and 31.49% for the S&P 500. The Russell 2000 Index, an index that tracks smaller capitalization companies, rose 25.53%. As has been the case for a number of years, growth stocks outperformed value (for both large and small cap) by 6-8% in 2019. This spread was driven by outperformance in more growth-oriented sectors like technology and some consumer-related companies whereas cyclical sectors such as energy and materials along with telecommunications and some healthcare lagged.

Non-U.S. equities' returns were strong as well though lagged that of domestic stocks. The Morgan Stanley Capital International All Country World Index excluding the U.S. Index (MSCI ACWI ex-U.S.), which includes both developed and emerging market companies, rose 21.51% (in U.S. dollar terms), behind the S&P 500 by 10%. Emerging markets as measured by the MSCI Emerging Markets Index lagged further but still up a respectable 18.42%. The tailwind generated by higher growth companies and sectors was present outside of the U.S. to an even greater degree than domestically. The MSCI ACWI ex-U.S. Growth Index outperformed the Value Index by just over 11%. For calendar 2019, the movement in the U.S. dollar relative to other major developed country currencies was a modest factor for U.S. dollar-based investors in overseas markets, depending on the region or country.

Following a very weak Q4 2018 and an especially significant decline for the month of December, the U.S. stock market staged a sharp rally in the last few days of 2018 that largely carried through the end of 2019 and into early 2020. The

sell-off in late 2018 was driven by China trade concerns as well as fears that the Federal Reserve's rate hikes would cause a slowdown in the economy. The "V" bottom in the stock market coming out of late 2018 and early 2019 was partially the result of the Fed reversing course on rate increases. Fed Fund rates were actually lowered several times throughout 2019 helping propel the equity market higher throughout the year with only a few minor pullbacks occurring in May, August and September/October.

As was mentioned previously, growth stocks continued to drive markets both domestically and abroad. Value-oriented indices and managers tended to lag in 2019 as they are often more heavily weighted in energy and materials and have less exposure to growth-focused areas like some consumer and technology companies. Among the primary drivers of this continuing value underperformance trend were two-fold: (1) relative softness in some cyclical companies and industries partly driven by fears of a deceleration in the global economy, especially in China and (2) fundamental strength in secular, organic growth companies combined with a willingness of investors to place ever-increasing valuations on such companies.

In calendar year 2019, OP&F's U.S. Equity Composite rose 31.29% (net of fees). This compared favorably to the Wilshire 5000, which returned 31.02% but slightly lagged the S&P 500 which rose 31.49%.

The OP&F Total International Equity Composite in 2019 rose 22.84% (net of fees) which outperformed the benchmark MSCI ACWI ex-U.S. Iran & Sudan Free Policy Index, which was up 21.63%, by 1.21%.

## MIDSTREAM ENERGY INFRASTRUCTURE

Midstream Energy/MLPs lagged the broad equity markets in 2019. The Midstream Energy Infrastructure asset class policy index returned 17.21% in 2019. The midstream space was on pace with the U.S. stock market through mid-year and was lagging by a modest 5% through late-September. However, midstream struggled in the final quarter of the year, trailing the S&P 500 by about 7%.

The public midstream pipeline industry has gone through some structural changes in the last several years. The MLP structure, which benefits from favorable tax treatment, was made less attractive after the tax code changes and corporate tax cuts of a couple years ago. The cost of capital for MLPs also rose and became less attractive due to the partnership structure. This created headwinds for MLPs to raise capital at a reasonable cost. This gradually became more problematic as MLPs were not able to fund their growth internally via cash flow but had to increasingly rely on high cost debt.

Ultimately, management teams decided to reduce their growth plans in order to fund their businesses with internally generated free cash flow because externally raised debt or equity had become too expensive. Consequently, over the last couple of years, midstream management teams have taken several actions to increase shareholder value including (1) buying in partnerships (MLPs) in order to reduce corporate and financial complexity, (2) slowing pipeline expansion and build-outs leading to reduced capital spending to improve free cash flow generation and (3) reducing distributions to unit holders to preserve cash and improve free cash flow.

From a market structure standpoint, the gradual reduction in the number of publicly traded MLPs due to the previously mentioned buy-in of many MLPs by their parent corporations caused an undesirable level of concentration in various MLP Indices, including that of OP&F's benchmark, the Alerian MLP Index. As a result of analysis by our consultant Wilshire, OP&F Staff and our managers, in early 2019 the investment guidelines for our midstream managers were amended to change the benchmark to the Alerian Midstream Energy Index as well as open up allowable investments to securities traded in North America rather than just the United States. This had the effect of improving the diversity, both geographically and by corporate structure, of the benchmark index and consequently the midstream portfolios within this asset class.

As stated in prior OP&F Annual Reports, midstream energy company securities' prices should not be particularly correlated with crude oil/natural gas prices in normal commodity environments because midstream operations (including pipeline transmission, distribution, storage and related businesses) tend to have relatively stable business models and should not be particularly dependent on changes in oil or natural gas prices. This business model stability is because midstream companies (1) sign very long term (10 years or more) customer contracts, (2) have contracts that obligate their Exploration and Production customers to pay the pipeline company regardless of the volumes pushed through the pipelines, and (3) pipeline companies have a history of positive cash flow and increasing distributions. Midstream stock prices and commodity price correlations can rise though if energy prices fall too far causing investors to begin to fear a major dislocation in the production of oil and the financial viability of the oil and gas producers.

The OP&F Midstream Energy Infrastructure portfolio rose 12.84% (net of fees) in 2019 which lagged the Policy benchmark by 4.37%. Of note, for the reasons mentioned above, OP&F shifted its index on July 01, 2019 to the Alerian Midstream Energy Index from the Alerian MLP Index. Thus the benchmark in 2019 was a blend of the Alerian MLP Index for the first six months of the year and the Alerian Midstream Energy Index for the last six months of 2019.

## FIXED INCOME – CORE AND INFLATION PROTECTED BONDS

Economic growth in 2019 was solid though slipped modestly compared to 2018 and late-2017. This provided some modest downward pressure on the ten year U.S. Treasury yield during 2019. The ten year Treasury yield started 2019 at 2.68% and that was essentially the high water mark for the year. The three month Treasury bill/ten year bond yield curve inverted (where the three month Treasury bill yield exceeded the ten year yield) in May of 2019. The two year/ten year Treasury spread did not go negative but did narrow to zero in September. An inverted yield curve has historically had a reasonably good track record of preceding recessions by 12-18 months so this created some concern that the economy was peaking in spite of good economic growth and employment numbers throughout the year. Ultimately the ten year Treasury declined to 1.88% by year-end as falling rates on the short end of the curve driven by the Federal Reserve's more accommodative monetary policy and the potential for ongoing, contentious U.S./China trade talks and tariffs weighed on economic growth. Ultimately, China and the U.S. did negotiate and finally complete a Phase I trade deal in late 2019 and early 2020 after nearly two years of negotiation. This, along with solid job growth, allowed the U.S. to begin 2020 in decent, though not robust, economic shape. The Fed's aggressive easing on the short end of the yield curve and continuing steady economic growth helped the yield curve to return to a positive slope by year end, which helped alleviate some of the recessionary fears from earlier in the year.

The OP&F Core Fixed Income Composite returned 7.68% (net of fees) for the year, underperforming by 1.04% the Bloomberg Barclay's Aggregate Bond Index return of 8.72%.

The OP&F U.S. TIPS Composite rose nicely in 2019, up 14.62% (net of fees). However, after a strong relative return year in 2018, this was slightly behind the TIPS Policy benchmark of 15.12%.

## HIGH YIELD

After a slightly negative absolute return year in 2018, the U.S. high yield bond market rallied approximately 14% (net of fees) in 2019. High yield spreads versus the ten year U.S. Treasury yield narrowed over the course of the year, falling from roughly 5.4% on the first of the year to 3.7% by the end of December, as investors continued to search for yield in a low and falling rate environment.

Interestingly, in spite of strong absolute returns in high yield, the lower quality end of the spectrum underperformed which has not been the case in recent years. Previously, when high yield returns were strong, bonds of lower quality, more leveraged company bonds such as CCCs outperformed higher quality

ones such as BBs. However, in 2019 BBs rose 15.7% while CCCs were up just 9.4%. This could have been a function of high yield investors becoming a bit more discerning by searching for higher quality as the economy moved later into the cycle and corporate leverage generally rose from prior years.

The OP&F High Yield Composite rose 13.10% (net of fees) in 2019 lagging by 1.31% versus the 14.41% return of the Merrill Lynch U.S. High Yield Constrained Index.

## PRIVATE CREDIT

Since the inception of the commitment to the private credit asset class, OP&F has focused on senior secured lending in the corporate middle market space, also known as direct lending. As has been the case for the prior couple of years, the private credit allocation will increase going forward as OP&F lowers the high yield allocation. Research has demonstrated that historically the relatively higher quality end of the direct lending market (direct loans to mostly private, corporate small and mid-sized companies) has provided better yields and returns, better loan covenant protections, lower default rates and higher recoveries than the public high yield market. Private lending became more aggressive in recent years so it will be interesting to see if these dynamics unfold similarly to past recessions during the next economic slowdown.

As public high yield bond spreads move, generally so move direct lending spreads. The narrowing of spreads we saw in 2019 creates some challenges to direct lending managers given their typically higher yields than the public markets. As mentioned, some private credit managers have relaxed covenant and other terms to stay competitive. OP&F works to reduce some of these risks by committing to strategies that are mostly senior secured, first lien loans and by investing with experienced managers with a history of operating in difficult environments and generating good overall returns through the cycle.

Since the initial investment in April of 2014 through year-end 2019, the return for OP&F's private credit program was 10.28%. As of the end of 2019, the program had nine different funds managed by seven distinct private credit managers. In addition, in January of 2020, two more funds were added, one with a new manager and one with an existing manager.

## REAL ESTATE

As a whole, real estate markets delivered a moderate return in 2019. For stabilized assets, income remained steady. Appreciation was in-line with long-term averages.

Within the asset class, a divergence among property types continued. Industrial (warehouse) continued to perform well, driven by demand from e-commerce. Retail continued

to lag. Looking ahead into 2020, those trends have continued and intensified.

For the year ended Dec. 31, 2019, OP&F's total real estate portfolio delivered an 8.58% return gross of fees and a 6.72% return net of fees. OP&F's net return exceeded the Open End Diversified Core Equity (ODCE) index net of fees by 233 bps during the year.

The portfolio is designed to exceed the ODCE index by 50 bps per year on a net basis over full market cycles. It has accomplished that goal over most long-term measurement periods. Over the trailing 10-year period, OP&F's portfolio exceeded the ODCE by 72 bps per year net of fees.

The real estate program is divided into a lower-risk, lower-return strategic portfolio and a higher-risk, higher-return tactical portfolio.

During the year, OP&F's strategic portfolio underperformed the ODCE index by 97 bps net of fees. Underperformance was attributable largely to a single fund. OP&F reduced its exposure to that fund in 2017 and is continuing to do so.

In contrast, the tactical portfolio outperformed the ODCE index by 653 bps net of fees during the year, leading to overall outperformance for the real estate program. In the tactical portfolio, OP&F has greater flexibility to deviate from the benchmark and to take calculated risk in pursuit of higher returns.

Within the higher-risk tactical portfolio, OP&F has sought to temper its overall level of downside exposure by blending in some moderate-risk core plus funds, by seeking funds with more durable capital structures, and through strategy and manager selection. Looking ahead, the work done in that area will be put to the test in 2020.

In addition to seeking to achieve its return target, OP&F remains focused on real estate's other strategic objectives: diversifying OP&F's broader portfolio and serving as a partial inflation hedge. Each investment is selected based on its risk/return profile and on its expected ability to advance these other goals.

During the 12 months ended Dec. 31, 2019, OP&F's market exposure to real estate decreased from 12.2% to 11.1%. Exposure was below the 12% target allocation at year-end, but well within the targeted range for real estate. At year-end, 52.5% of OP&F's real estate market exposure was from the strategic portfolio, with the remainder coming from the tactical portfolio. OP&F is maintaining its philosophy of investing patiently and prioritizing attractive risk-adjusted returns.

## REAL ASSETS

OP&F established an allocation to real assets in 2016. The allocation currently covers timberland, agriculture, and infrastructure, and is distinct from the separate allocations that OP&F has established for real estate and MLPs. The program is designed to provide diversification, to hedge against inflation, to preserve capital, and to generate attractive risk-adjusted returns through a combination of income and appreciation.

For the year ended Dec. 31, 2019, the portfolio delivered a gross of fees time-weighted return of 7.68%, and a net of fees return of 5.85%. For the trailing five-year period, the gross return was 5.91% and the net return was 4.50%.

The real assets portfolio is designed to deliver a return that exceeds inflation by 5.0% net of fees over full market cycles. The program does not yet have a sufficient history to measure a full market cycle. Based on the trailing five-year return, the real assets portfolio is behind pace, trailing the benchmark by 240 bps. As the portfolio matures, comparisons against this benchmark will become more meaningful.

The real assets program is still in development. At the end of the year, the program represented 3.0% of OP&F's total portfolio relative to a long-term target of 8.0%. Unfunded commitments represented another 2.3% of OP&F's total portfolio. The portfolio remains tilted toward timberland investments, with infrastructure building toward its targeted range. Portfolio construction objectives include: building total exposure gradually; building diversification across the program's three main sectors; maintaining balance between lower risk strategic and higher-risk tactical investments; maintaining a focus on developed markets; and building long-term returns while controlling risk.

## PRIVATE MARKETS

For the year ending September 30, 2019 (private market returns are lagged by one quarter), OP&F's private markets portfolio provided a net return, on a time-weighted basis, of 13.65%. To note, evaluating private markets performance over short-time periods can be misleading. With that said, for the ten-year period ending September 30, 2019, the portfolio provided an annualized net return of 14.09%.

In 2014, OP&F adopted changes to how it evaluates the performance of the private markets portfolio. The methodology evaluates the performance of the private markets program by developing a Public Markets Equivalent (PME) comparison. A PME comparison utilizes an Internal Rate of Return (IRR) calculation of all historical cash flows and compares the resulting performance to a public market proxy index, by assuming that all of the same cash flows are invested in the

public market index. This methodology allows for the purest comparison of the private markets program performance to that of a public market alternative. Secondly, the performance of the private markets program is evaluated relative to the Refinitiv Thompson One Private Equity Pooled Horizon IRR: Net to Limited Partners peer universe, or equivalent. The peer universe data allows OP&F to compare the private markets program to other private markets programs and managers over specified time periods. For the ten-year period ending September 30, 2019, OP&F's private markets program provided a net IRR of 13.8%, outperforming the Wilshire 5000 PME by 0.7% annualized. In addition, OP&F's private markets program has outperformed the Wilshire 5000 PME on a net of fee basis since inception. Relative to the Refinitiv Thompson One Private Equity Pooled Horizon IRR: Net to Limited Partners peer universe, as of September 30, 2019, OP&F's private markets program's net of fee IRR ranks above median across all time-periods and in the top quartile on a one-year and three-year basis.

Throughout all of 2019 and the beginning of 2020, before the global outbreak of the COVID-19 pandemic, the themes that have dominated the asset class of private markets for the past decade continued. Fundraising remained relatively strong, although contracting from 2018 slightly, valuation multiples (i.e. pricing) remained high as a record amount of dry powder remains on the sidelines available for investment, the exit environment remained relatively healthy, especially the mergers and acquisitions (M&A) market, and returns remained strong. Although it is still too early to say what the potential medium and long-term impacts of the COVID-19 pandemic will be on the asset class, it is safe to say there will be material negative impacts in the short-term given the significant and sudden supply and demand shocks to the economy. Over the medium and long-term, the impacts will depend upon how long it will take for economic activity to return to normal and how impactful will the unprecedented monetary and fiscal stimulus response be from central banks and governments around the world.

It was noted in this section in last year's report that the probability of being closer to an economic slowdown or recession was higher than the entrance into a new economic expansion and that investors should start thinking of adding exposure to strategies that may afford downside protection, focusing on smaller managers that may utilize lower leverage and reserving capital to take advantage of opportunities if such a slowdown or recession should occur. In 2019, OP&F did reserve capital by not committing the allotted amount for new opportunities as well as making several commitments to smaller funds. In addition, OP&F approved a strategy to allow OP&F to opportunistically pursue co-investments alongside private markets funds which will allow OP&F to average down overall program costs, provide greater control over vintage year, geographical, and industry exposure and enhance program returns through proper deal selection.

On an invested basis, private markets comprised approximately 8.4% of OP&F's total assets as of year-end. Although the allocation at year-end was above the long-term target allocation of 8.0%, the private markets allocation is well within the policy range of 5.6% to 10.4%. OP&F will continue to manage the private markets allocation to OP&F's long-term target by adopting annual private markets investment plans that allows OP&F the flexibility to manage the private markets portfolio based on suitable investment opportunities while also taking into consideration current market conditions. In addition, the annual private markets investment plans will seek to maintain appropriate vintage year diversification for the private markets portfolio. OP&F will mainly target commitments to primary partnerships, and on an opportunistic basis, co-investments and secondary partnerships. As always, OP&F and its dedicated private markets investment consultant will prudently recommend commitments that seek for the private markets portfolio to remain compliant with applicable policies and guidelines.

## 2020 DEVELOPMENTS AND CHALLENGES AHEAD

In early 2020, OP&F approved the 2020 real estate investment plan. The plan included submitting a partial redemption request from UBS Trumbull Property Fund, and in order to reduce fees, submitting documentation to place the remaining investment in separate non-binding lock-up periods. Additionally, OP&F submitted a full redemption request for USAA Eagle Real Estate Fund. More adjustments regarding OP&F's real estate open-end funds are expected upon completion and approval of the 2020 real estate open-end fund rebalancing review later this year. Given the volatility created by COVID-19 and in order to increase the liquidity capacity for OP&F, the dividend reinvestment plans were turned off for LaSalle Property Fund, Lion Industrial Trust and Morgan Stanley PRIME Property Fund. Below are some of the other items already addressed in 2020 and a number that still lie ahead:

- Amended OP&F's Investment Policy & Guidelines statement.
- Amended OP&F's Proxy Voting Policy:
  - Included for the first time a detailed international proxy voting section.
- Amended investment manager guidelines for Russell Portable Alpha Overlay Services and Russell Policy Implementation Overlay Services.
- Engaged OP&F's private markets investment consultant to provide fee verification services for OP&F's private markets and private credit investments.
- Began redistribution of assets from terminated core fixed income mandate to existing core fixed income investment managers.

- Began implementation of core fixed income leverage according to the core fixed income investment structure adopted in 2019.
- Fully liquidated from last remaining commercial mortgage investment.
- Transitioned assets from terminated high yield mandate to existing high yield investment managers.
- Approved the 2020 private markets investment plan.
- Began implementation of the 2020 private markets investment plan:
  - Made commitments to Altaris Health Partners V, Francisco Partners VI and MBK Partners Fund V.
- Approved the 2020 real assets investment plan.
- Began implementation of the 2020 real assets investment plan:
  - Made a commitment to iCon Infrastructure Fund V.
- Implement the remaining investment objectives of the 2020 real estate investment plan.
- Approve the 2020 private credit investment plan.
- Amend OP&F's Private Markets Investment Policy.
- Finalize documentation for TorreyCove's co-investment proposal.
- Review OP&F's Real Estate Investment Policy for possible revisions.
- Review OP&F's Real Assets Investment Policy for possible revisions.
- Review OP&F's Private Credit Investment Policy for possible revisions.

Another item of interest in 2020 that OP&F will continue to evaluate is the merits of conducting either an asset/liability valuation study or asset allocation study. The study would likely address several issues, including the allocation to Midstream Energy Infrastructure, formerly labeled as MLPs. Due to the near-term and potential long-term economic impacts of COVID-19, the merits of conducting a study may have heightened as the impacts on capital markets assumptions become evident. Beyond the already mentioned initiatives, OP&F will continue to look for ways to reduce the costs of OP&F's operations as well as to compare OP&F's current procedures to other approaches or best practices for areas of improvement or better efficiencies.

## INVESTMENT PORTFOLIO SUMMARY

### INVESTMENT PORTFOLIO SUMMARY - AS OF DEC. 31, 2019

Investment Type	Percent of Net Investment Value	Fair Value
Cash and Cash Equivalent*	6.81%	\$1,123,041,534
U.S. Government Treasury Obligations	0.84%	138,109,809
U.S. Government Treasury STRIPS	0.03%	5,407,375
U.S. Agency Mortgage and Asset-Backed Securities	1.77%	292,277,303
Non-Agency Mortgage and Asset-Backed Securities	1.60%	263,767,973
Municipal Bond Obligations	0.04%	5,982,870
Corporate Bonds and Obligations	11.66%	1,921,928,853
Domestic Commingled Bonds	7.05%	1,162,495,810
International Bonds	0.15%	25,134,216
Domestic Equities	13.29%	2,191,380,180
Domestic Pooled Equities	8.65%	1,425,147,577
International Equities	18.61%	3,067,303,781
Real Estate	11.00%	1,812,655,901
Domestic and International Derivatives	(0.02)%	(3,059,999)
Commercial Mortgage Funds	0.22%	36,197,953
Private Equity	8.60%	1,418,364,017
Private Debt	3.60%	593,814,395
Real Assets	2.97%	489,307,759
Master Limited Partnerships	3.57%	587,559,232
<b>TOTAL FAIR VALUE - CASH AND SECURITIES</b>	<b>100.44%</b>	<b>\$16,556,816,539</b>
Accrued Income	0.26%	42,071,047
Sales Receivable	0.25%	41,220,242
Purchases Payable	(0.95)%	(156,003,638)
<b>NET INVESTMENT VALUE (TRADE DATE BASIS)</b>	<b>100.00%</b>	<b>\$16,484,104,190</b>

\*Cash and cash equivalents are included in cash and short-term investments on the Statement of Fiduciary Net Position.

**TEN LARGEST COMMON STOCKS (BY FAIR VALUE)**

<b>Stocks</b>	<b>Shares</b>	<b>Fair Value</b>
TC Energy Corp	1,894,089	\$100,973,885
Kinder Morgan Inc.	3,841,402	81,322,480
Enbridge Inc.	1,940,622	77,178,536
Williams Cos.	3,190,093	75,669,006
Oneok Inc.	957,441	72,449,561
Cheniere Energy Inc.	1,010,437	61,707,387
Targa Resources Corp	1,200,367	49,010,985
Volkswagen AG Pfd	172,259	34,077,898
Roche Holdings AG-Genusschein	104,244	33,802,464
Pembina Pipeline Corporation	901,255	33,400,510

**TEN LARGEST BONDS AND OBLIGATIONS (BY FAIR VALUE)**

<b>Description</b>	<b>Coupon</b>	<b>Maturity Date</b>	<b>Par Value</b>	<b>Fair Value</b>
U.S. Treasury Bond	2.875	Aug. 15, 2045	\$10,500,000	\$11,504,883
CCO Holdings LLC/CAP Corp	4.750	March 01, 2030	10,995,000	11,187,413
Transdigm Inc.	6.250	March 15, 2026	7,835,000	8,481,388
Sprint Corp	7.125	June 15, 2024	7,740,000	8,339,851
U.S. Treasury Bond	4.250	Nov. 15, 2040	6,050,000	8,020,485
CDW LLC	3.460	Aug. 17, 2023	7,981,309	8,016,267
U.S. Treasury Bond	2.250	Aug. 15, 2049	8,205,000	7,981,824
GFLENV TL	4.702	Sept. 27, 2023	7,882,182	7,887,779
SBA Communications	3.460	Apr. 11, 2025	7,769,188	7,791,874
U.S. Treasury Note	0.875	Jan. 15, 2029	7,191,908	7,783,927

**TEN LARGEST REAL ESTATE HOLDINGS (BY FAIR VALUE)**

<b>Description</b>	<b>Fair Value</b>
Prudential PRISA	\$220,966,691
JP Morgan Strategic Property	219,795,098
Heitman Core Property Fund	143,135,500
Morgan Stanley Prime Property	102,202,710
UBS Trumbull Property Fund	89,678,263
Jamestown Premier PropertyFund	88,964,331
LaSalle Property Fund, LP	87,149,909
Lion Industrial Trust	84,979,358
Blackstone RE Partners VIII	65,982,721
Hancock U.S. Real Estate Fund LP	63,492,382

A complete listing of portfolio holdings is available upon request.

## SCHEDULE OF INVESTMENT RESULTS (FOR THE YEAR ENDED DEC. 31, 2019)

	Annualized Rates of Return		
	1-Year	3-Year	5-Year
<b>Domestic Equity</b>			
<b>OP&amp;F</b>	<b>31.77%</b>	<b>15.97%</b>	<b>12.65%</b>
Wilshire 5000	31.02%	14.52%	11.38%
<b>International Equity</b>			
<b>OP&amp;F</b>	<b>23.35%</b>	<b>9.61%</b>	<b>6.07%</b>
International Equity Policy Benchmark	21.63%	9.84%	5.71%
<b>Private Markets **</b>			
<b>OP&amp;F</b>	<b>13.65%</b>	<b>17.13%</b>	<b>14.31%</b>
Wilshire 5000 + 3%	6.04%	16.30%	13.92%
<b>High Yield</b>			
<b>OP&amp;F</b>	<b>13.49%</b>	<b>6.53%</b>	<b>6.21%</b>
Merrill Lynch U.S. High Yield Constrained Index *	14.41%	6.32%	6.17%
<b>Private Credit **</b>			
<b>OP&amp;F</b>	<b>11.62%</b>	<b>10.42%</b>	<b>6.91%</b>
S&P LSTA Levered Loan Index + 2%	5.16%	6.62%	6.06%
<b>Treasury Inflation Protected Securities (TIPS)</b>			
<b>OP&amp;F</b>	<b>15.70%</b>	<b>5.89%</b>	<b>7.17%</b>
Bloomberg Barclays U.S. Gov't Inflation Linked Bond Index	15.12%	3.67%	4.90%
<b>Real Estate **</b>			
<b>OP&amp;F</b>	<b>8.76%</b>	<b>10.90%</b>	<b>12.51%</b>
National Council of Real Estate Investment Fiduciaries (NCREIF) ODCE Index	4.64%	6.34%	8.35%
<b>Real Assets **</b>			
<b>OP&amp;F</b>	<b>7.08%</b>	<b>7.81%</b>	<b>5.45%</b>
CPI + 5%	6.80%	7.18%	6.60%
<b>Midstream Energy Infrastructure</b>			
<b>OP&amp;F</b>	<b>13.46%</b>	<b>(1.83)%</b>	<b>(4.24)%</b>
Alerian Midstream Energy Index *	17.21%	(1.36)%	(5.21)%
<b>Fixed Income</b>			
<b>OP&amp;F - Core</b>	<b>8.13%</b>	<b>4.50%</b>	<b>3.81%</b>
Bloomberg Barclays Aggregate	8.72%	4.03%	3.05%
<b>OP&amp;F - Commercial Mortgages **</b>	<b>6.73%</b>	<b>4.95%</b>	<b>4.73%</b>
Bloomberg Barclays Mortgage Index **	7.80%	2.32%	2.80%
<b>Total Portfolio</b>			
<b>OP&amp;F</b>	<b>17.89%</b>	<b>9.80%</b>	<b>8.16%</b>
Policy Index ***	16.32%	8.31%	6.76%

\* a) High Yield (HY) benchmark is a blend of the CS First Boston Dev. Countries HY through Aug. 31, 2016, the CS First Boston High Yield from Sept. 1, 2016 through Nov. 30, 2016, and the Merrill Lynch U.S. High Yield Constrained Index from Dec. 1, 2016 forward. b) Midstream Energy Infrastructure benchmark is a blend of the Alerian MLP Index from July 1, 2013 thru June 30, 2019, and the Alerian Midstream Energy Index from July 1, 2019 forward.

\*\* One quarter in arrears.

\*\*\* Interim Policy Index: 18% Wilshire 5000, 18% MSCI ACWI ex-U.S. Iran/Sudan Free IMI Index, 11% Bloomberg Barclays Aggregate, 9% Merrill Lynch U.S. High Yield Constrained Index, 3.5% S&P LSTA Levered Loan Index + 2% Lagged, 8.5% Bloomberg Barclays U.S. Gov't Inflation Linked Bond Index X2 (-) Libor, 12% NCREIF ODCE Index (Net) Lagged, 7.5% Wilshire 5000 + 3% Lagged, 4.5% CPI + 5% (Net) Lagged, 8% Alerian Midstream Energy Index.

Long-Term Policy: 16% Wilshire 5000, 16% MSCI ACWI ex-U.S. Iran/Sudan Free IMI Index, 23% Bloomberg Barclays Aggregate, 7% Merrill Lynch U.S. High Yield Constrained Index, 5% S&P LSTA Levered Loan Index + 2%, 17% Bloomberg Barclays U.S. Gov't Inflation Linked Bond Index X2 (-) Libor, 12% NCREIF ODCE Index (Net) Lagged, 8% Wilshire 5000 + 3% Lagged, 8% CPI + 5% (Net) Lagged, 8% Alerian Midstream Energy Index. (adds to 120% as "Risk Parity" approach uses 2x levered U.S. Gov't Inflation-Protected Securities and 2x levered Core Fixed Income).

Time Weighted methodology, based upon fair values, is used when calculating performance.

# INVESTMENT CONSULTANTS AND MONEY MANAGERS (FOR THE YEAR ENDED DEC. 31, 2019)

## INVESTMENT CONSULTANTS

TorreyCove Capital Partners  
(The) Townsend Group  
Wilshire Associates

## INVESTMENT MANAGERS – DOMESTIC EQUITY

Bridgewater Associates, LP  
Grosvenor Capital Management, LP  
Macquarie Investment Management  
N.A. Investcorp, LLC  
Russell Investments Implementation  
Services, LLC  
State Street Global Advisors

## INVESTMENT MANAGERS – INTERNATIONAL EQUITY

Arrowstreet Capital, LP  
Causeway Capital Management, LLC  
Dimensional Fund Advisors  
Franklin Templeton  
Harding Loevner, LP  
Russell Investments Implementation  
Services, LLC

## INVESTMENT MANAGERS - REAL ESTATE

Asana Partners  
AEW Capital Management  
Almanac Realty Investors  
Aermont Capital, LLP  
Black Creek Group  
(The) Blackstone Group  
Brookfield Asset Management, Inc.  
Clarion Partners  
Colony Capital, LLC  
Cortland Partners  
DivcoWest Real Estate Services, LLC  
Exeter Property Group  
Fortress Japan Opportunity Management, LLC  
(The) Gerrity Group  
Greystar Investment Group, LLC  
Hancock Capital Investment Management, LLC  
Heitman Capital Management, LLC  
Jamestown Premier GP, LP  
JP Morgan Investment Management, Inc.  
LaSalle Investment Management  
Lone Star Funds  
Lubert-Adler Management Co., LLC  
Morgan Stanley Real Estate Advisors, Inc.  
Prudential Real Estate Investors  
Savanna Investment Management, LLC  
Starwood Capital Group  
Stockbridge Real Estate Fund

TA Realty Associates  
Tricon Capital Group, Inc.  
TriGate Capital  
UBS Realty Investors, LLC  
USAA Eagle Real Estate GP, LLC  
VBI Real Estate  
Walton Street Capital, LLC  
Westbrook Partners, LLC

## INVESTMENT MANAGERS –MIDSTREAM ENERGY INFRASTRUCTURE

Harvest Fund Advisors, LLC  
Salient Capital Advisors, LLC  
Tortoise Capital Advisors, LLC

## INVESTMENT MANAGERS – REAL ASSETS

ACM Management Company, LLC  
Brookfield Asset Management, Inc.  
Brookfield Timberlands Management  
Forest Investment Associates  
Global Forest Partners  
Hancock Timber Resources Group  
IFM Investors  
Meridiam Infrastructure North America  
Corporation

## INVESTMENT MANAGERS – FIXED INCOME

Bridgewater Associates, LP  
Loomis Sayles & Company, LP  
MacKay Shields, LLC  
Neuberger Berman  
Pacific Investment Management Company, LLC  
PGIM, Inc.  
Prima Capital Advisors, LLC  
Russell Investments Implementation  
Services, LLC  
Western Asset Management

## INVESTMENT MANAGERS – PRIVATE CREDIT

ArrowMark Partners  
BlackRock, Inc.  
CapitalSpring Direct Lending Partners  
GSO Capital Partners, LP  
Kohlberg Kravis Roberts & Co., LP  
MC Credit Partners, LP  
Owl Rock Capital Corporation  
Tennenbaum Capital Partners, LLC

## INVESTMENT MANAGERS – PRIVATE EQUITY

Abbott Capital Management, LLC

Adams Street Partners  
Advent International  
Altaris Capital Partners, LLC  
Apollo Management, LP  
Athenian Venture Partners  
Blackstone Capital Partners  
Blue Chip Venture Partners, LP  
Blue Point Capital Partners, LP  
Cinven  
Coller Capital  
Conway MacKenzie  
Cortec  
EQT  
Francisco Partners  
Glendon Capital Management, LP  
GTCR, LLC

HarbourVest Partners, LLC  
Harvest Partners  
Horsley Bridge Partners, LLC  
(The) Jordan Company  
Kirtland Capital Partners  
Kohlberg Kravis Roberts & Co., LP  
Landmark Equity Partners  
Leonard Green & Partners, LP  
Lexington Capital Partners  
Linsalata Capital Partners  
Littlejohn & Co., LLC  
Marlin Equity Partners  
MBK Partners  
Montauk TriGuard Management, Inc.  
Morgenthaler Venture Partners  
NGP Energy Capital Management  
Northgate Capital Group  
Park Street Capital  
Primus Venture Partners  
Rhône Capital, LLC  
(The) Riverside Company  
Riverstone Investment Group, LLC  
RRJ Capital  
Stonepoint Capital  
Summit Partners  
TA Associates, LP  
Tenex Capital Management, LP  
Veritas Capital  
Vista Equity Partners  
Warburg Pincus  
Wilshire Private Markets, LLC

## SECURITIES LENDING AGENTS

Key Bank Securities Lending  
Northern Trust

## OTHER PROFESSIONAL CONSULTANTS

(see page vii)

## SCHEDULE OF BROKERS' FEES PAID (FOR THE YEAR ENDED DEC. 31, 2019)

Broker Name	Fees Paid	Units Traded	Average Cost Per Unit
Goldman Sachs	\$427,584	5,108,210	\$0.0837
B. Riley FBR, Inc.	216,607	7,219,481	0.0300
Credit Suisse First Boston	106,079	10,287,353	0.0103
Merrill Lynch	99,752	12,291,075	0.0081
Morgan Stanley	93,457	15,953,075	0.0059
UBS Securities	79,903	7,427,062	0.0108
Citigroup	77,809	8,710,924	0.0089
Jefferies & Co., Inc.	60,030	6,278,825	0.0096
Barclays Securities, Inc.	57,152	4,987,802	0.0115
JP Morgan	56,422	16,492,223	0.0034
Liquidnet, Inc.	41,245	7,863,713	0.0052
Macquarie	38,018	15,978,570	0.0024
Wells Fargo Securities	36,396	3,894,316	0.0093
Sanford C. Bernstein	33,043	3,069,055	0.0108
RBC Capital Markets	48,769	7,272,042	0.0067
Virtu ITG	23,812	5,616,847	0.0042
Daiwa	22,938	505,500	0.0454
HSBC Securities, Inc.	21,040	4,439,014	0.0047
Brokers Less than \$20,000	261,203	26,960,284	0.0097
<b>TOTAL</b>	<b>\$1,801,259</b>	<b>170,355,371</b>	<b>\$0.0106</b>

# INVESTMENT POLICY AND GUIDELINES

*Minor formatting edits have been made to the Board of Trustee approved investment policy and guidelines in order to provide style consistency throughout the CAFR.*

## 1. INTRODUCTION

The purpose of this Investment Policy and Guidelines (Policy or Statement) is to define the framework for investing the assets (Total Portfolio) of the Ohio Police & Fire Pension Fund (OP&F or Plan). This Statement is intended to provide general principles for establishing the goals of OP&F, the allocation of assets and the employment of outside asset management. The statutory investment authority of the Board of Trustees (or the Board) is set forth in Sections 742.11 to 742.113 and Sections 742.114, 742.116 of the Ohio Revised Code (ORC), as amended from time to time. The Board may delegate these duties to an Investment Committee.

The objectives of OP&F have been established in conjunction with a comprehensive review of the current and projected financial requirements. These objectives are:

- To have the ability to pay all benefit and expense obligations when due.
- To maintain the purchasing power of the current assets and all future contributions by maximizing the rate of return on OP&F's assets at a reasonable level of risk.
- To maintain 30-year funding and achieve full funding on an actuarial accrued liability basis.
- To control the costs of administering OP&F and managing the investments.

The investment objectives of the Total Portfolio are:

- Long-term returns on Plan investments, in addition to contributions received from members and employers, should satisfy any current funding obligations of the Plan when and as prescribed by law and, once the Plan is fully funded, should keep pace with the growth of Plan liabilities.
- The investment performance goal for the Total Portfolio is to meet or exceed the return of the Total Portfolio policy benchmark over a full market cycle, generally measured over three- to five-years, without taking on additional risk as measured by standard deviation of returns. The Total Portfolio policy benchmark is a weighted average, based on the allocation target defined in Section 3 below, of each asset class benchmark.

In order to achieve these objectives, the Board of Trustees will conduct itself in accordance with ORC Section 742.11, which provides "The Board and other Fiduciaries shall discharge

their duties with respect to OP&F solely in the interest of the participants and beneficiaries." These duties shall also be carried out "with care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and like aims", as referenced in ORC Section 742.11. All aspects of this Statement should be interpreted in a manner consistent with OP&F's objectives. At least annually, the Board shall review and adopt policies, objectives or criteria for the operation of the investment program and make such changes as appropriate.

Investment policies and Investment Manager(s) guidelines referenced in this document are separate policies governing specific aspects of managing the Total Portfolio and are not reproduced in this Statement, but are incorporated by reference as governing documents of the Plan.

## 2. DEFINITION OF RESPONSIBILITIES

### A. BOARD OF TRUSTEES/INVESTMENT COMMITTEE

The statutory investment authority of the Board with regard to the Plan is set forth in Chapter 742, as described above, provides that in its capacity as a fiduciary, the Board of Trustees/Investment Committee must discharge its duties in a prudent manner and for the exclusive benefit of the participants and beneficiaries of the Plan.

In discharging its duties, the responsibilities of the Board of Trustees/Investment Committee pursuant to this Policy include the following:

- Establish the strategic investment policy (Asset Allocation Policy) for OP&F in accordance with the above goals, and periodically review Asset Allocation Policy in light of any changes in actuarial variables and/or market conditions.
- Approve the investment structure for applicable asset classes identified in the Asset Allocation Policy.
- Select qualified Investment Consultant(s) and Investment Manager(s) to advise on and manage OP&F's assets recognizing the goals set forth in ORC Sections 742.11 and 742.116.
- Monitor and review the performance of selected Investment Manager(s) to determine achievement of goals and compliance with policy guidelines.
- Monitor the costs of the investment operations at least annually.
- Review, at least annually, the current investment policies of OP&F and make such changes as appropriate.
- Review applicable annual investment plan(s) prepared

by the staff and/or Investment Consultant(s). As conditions warrant, revise the annual investment plan(s) as the year progresses.

- Monitor investment activity for compliance with Board policies and adherence by Investment Manager(s) to strategy and direction.
- Review the overall investment performance to determine whether it meets established benchmarks.
- Evaluate and assign all Investment Manager(s) to a rating category as outlined in OP&F's Investment Manager Monitoring and Evaluation Policy.
- Review suggested changes or additions to the functions and operations regarding the investment operations of similar institutional investors.
- Review the proposed investment department annual operating budget and report its recommendations to the Finance Committee.
- Fulfill any other responsibilities as provided in the ORC and Investment Committee Charter.

The Board of Trustees/Investment Committee may authorize others such as OP&F staff, and may utilize the services of external advisors, such as actuaries, auditors, consultants and legal counsel, to implement decisions made by the Board. The comments and recommendations of such parties will be considered by the Board in conjunction with Board discussion of the issues for the purpose of making informed and prudent decisions.

## B. STAFF

Staff will be the primary liaison between the Board of Trustees/Investment Committee and the Investment Consultant(s), the Investment Manager(s), and the custodial bank(s). The Chief Investment Officer, Deputy Chief Investment Officer or Sr. Investment Officer – Public Markets are authorized in between meetings of the Board to take such actions as necessary in the best interests of the Total Portfolio and the Plan in keeping with the policies, strictures and guidelines which apply to the Board of Trustees. Staff's transactional authority is limited to ten percent of the Total Portfolio market value. In doing so, the staff will:

- Manage OP&F assets under its care and/or control in accordance with this Policy's objectives and guidelines set forth herein.
- Implement Board decisions regarding asset allocation, investment structure, Investment Manager(s) selection, and portfolio rebalancing procedures.
- Coordinate the Investment Manager(s) selection, evaluation, and retention decisions for the Plan's

investments, consistent with OP&F's Investment Manager Search Policy.

- Monitor both internally and externally managed assets to ensure compliance with guidelines set forth in this Policy.
- Establish a process to promptly vote all proxies and related actions in a manner consistent with OP&F's long-term interests and objectives set forth herein and OP&F's Proxy Voting Policy. Maintain detailed records of said voting of proxies and related actions and comply with all regulatory objectives related thereto.
- Manage the overall liquidity in the Total Portfolio to ensure timely payment of member benefit payments and Plan expenses and the investment of contributions consistent with established asset allocation and portfolio rebalancing policies.
- Report to the Board at least quarterly regarding the status of the Total Portfolio and its performance for various time periods. Meet with the Board at least annually to report on Investment Manager(s) performance and compliance with goals and objectives.
- Acknowledge and agree in writing to their fiduciary responsibility to fully comply with this Policy set forth herein, and as modified in the future.

## C. INVESTMENT CONSULTANT(S)

The Board of Trustees/Investment Committee may retain an investment consulting organization or organizations (the Investment Consultant(s)) to assist in the overall strategic investment direction of the Total Portfolio, or specific asset classes, and its implementation. Each such Investment Consultant(s), in recognition of its role as a fiduciary of the Plan, will assume specific duties. These duties shall generally include the following:

- Provide independent and unbiased information.
- Assist in the development of this Policy and other policies that govern the Plan investments.
- Assist in monitoring compliance with this Policy.
- Assist in the development and recommendation of strategic asset allocation targets, investment structure, and rebalancing procedures for the Total Portfolio or for a specified asset class.
- Assist in development of performance measurement standards.
- Assist in the Investment Manager(s) search and selection process consistent with OP&F's Investment Manager Search Policy.
- Monitor, evaluate and report to the Board on Total Portfolio and/or Asset Class and Investment Manager(s) performance on an ongoing basis.

- Conduct due diligence when an Investment Manager(s) fails to meet a standard.
- Establish a procedural due diligence search process.

#### D. INVESTMENT MANGER(S)

The Board of Trustees/Investment Committee may, from time to time, cause the Plan to retain one or more qualified investment managers ("Investment Manager(s)") to manage a portion of the Plan assets. When applicable, the Board of Trustees/Investment Committee shall approve each Investment Manager(s) guidelines, which may set forth the purpose, Investment Manager(s) philosophy and approach, authorized investments, prohibitions, typical portfolio characteristics, performance objectives and evaluation, and Investment Manager(s) communications. The Investment Manager(s) have certain responsibilities that include the following:

- Manage OP&F assets under its care, custody, where applicable, and/or control in accordance with this Policy's objectives and guidelines set forth herein and its governing agreement with OP&F.
- Exercise full investment discretion over the assets in their care within the guidelines set forth in this Policy and, where applicable, the specific guidelines established for the Investment Manager(s) in the governing agreements with OP&F.
- Constructing a portfolio of securities that reflects the execution of a specific investment strategy.
- Promptly inform the Board and staff in writing regarding all changes of a material nature pertaining to the firm's organization and professional staff.
- If directed, promptly vote all proxies and related actions in a manner consistent with OP&F's long-term interests and objectives set forth herein and OP&F's Proxy Voting Policy. Each Investment Manager(s) designated to vote shall keep detailed records of said voting of proxies and related actions and will comply with all regulatory obligations related thereto.
- Provide reporting to the Board or staff or Investment Consultant(s) quarterly regarding the status of the portion of the Total Portfolio managed by the Investment Manager(s) and its performance for various time periods. Meet or participate via teleconference or webcast with the Board or staff or Investment Consultant(s) annually or as needed to report on their performance and compliance with goals and objectives.
- Acknowledge and agree in writing to their fiduciary responsibility to fully comply with this Policy set forth herein, and as modified in the future.

#### E. OFFICE OF THE OHIO TREASURER/BOARD OF DEPOSIT/ CUSTODIAN(S)

Per Section 742.11 of the ORC, the Treasurer of the State of Ohio (the Treasurer of State) is designated as custodian of investment assets. As custodian, the Treasurer of State or its designee (as described below) will be responsible for holding and safekeeping Plan assets, settling purchases and sales of securities; and identifying and collecting income which becomes due and payable on assets held. The Treasurer of State may engage a qualified bank or trust company, as authorized agent of the Treasurer of State, to perform certain services on behalf of the Treasurer of State to fulfill its responsibilities as custodian.

### 3. ASSET ALLOCATION AND REBALANCING

It is the responsibility of the Board to determine the allocation of assets among distinct public and private market asset classes. The allocation will be completed in a manner consistent with commonly recognized financial principles. Application of these principles is expected to lead to a portfolio with the highest level of return consistent with the risk tolerance of OP&F.

The procedure for determining the allocation will consider the relevant characteristics of the liabilities and potential assets of OP&F. The liability considerations shall include, but not be limited to, current and expected future values of the benefits, and future contributions. These factors are important for identifying the investment horizon of OP&F and its cash flow requirements. The asset characteristics considered shall include, but not be limited to, current asset value, the potential return relative to the potential risk, and diversification characteristics.

The asset allocation must be consistent with the investment standards specified in ORC Section 742.11.

The risk/return characteristics of OP&F shall be reviewed on a periodic basis (no less than every five years) through a comprehensive asset liability valuation study. The goal of the study shall be to formulate an Asset Allocation Policy which maximizes return while minimizing overall risk through the most efficient combination of acceptable asset classes under the prudent person standard.

Based on an asset liability valuation study, which analyzed the expected returns, risk and correlations of various asset classes, projected liabilities, liquidity, and the risks associated with alternative asset mix strategies, the Board has established the following Asset Allocation Policy. The asset classes are "bucketed" or grouped together into macro-asset class buckets (i.e. growth, safety oriented and inflation hedging) based on their expected correlations to one another to create a better understanding of risk and diversification, and based on asset class exposures to the economic factors of growth and inflation.

Asset Class	Long-Term Target Allocation - Market Value	Range
Domestic Equity	16.0%	± 4.8%
Non-U.S. Equity	16.0%	± 4.8%
Private Markets	8.0%	± 2.4%
High Yield	7.0%	± 2.1%
Private Credit	5.0%	± 1.5%
<b>TOTAL GROWTH ASSETS</b>	<b>52.0%</b>	<b>± 9.0%</b>
Core Fixed Income	11.5%	± 2.3%
Cash	-%	+ 3.0%
<b>TOTAL SAFETY ORIENTED ASSETS</b>	<b>11.5%</b>	<b>± 2.3% / +5.3%</b>
U.S. Inflation Linked Bonds	8.5%	± 1.7%
Real Estate	12.0%	± 3.6%
Real Assets	8.0%	± 2.4%
Midstream Energy Infrastructure	8.0%	± 2.4%
<b>TOTAL INFLATION HEDGING ASSETS</b>	<b>36.5%</b>	<b>± 9.0%</b>
<b>TOTAL</b>	<b>100.0%</b>	

Asset Class	Long-Term Target Allocation - Notional Exposure
Domestic Equity	16.0%
Non-U.S. Equity	16.0%
Private Markets	8.0%
High Yield	7.0%
Private Credit	5.0%
<b>TOTAL GROWTH ASSETS</b>	<b>52.0%</b>
Core Fixed Income	23.0%
Cash	-%
<b>TOTAL SAFETY ORIENTED ASSETS</b>	<b>23.0%</b>
U.S. Inflation Linked Bonds	17.0%
Real Estate	12.0%
Real Assets	8.0%
Midstream Energy Infrastructure	8.0%
<b>TOTAL INFLATION HEDGING ASSETS</b>	<b>45.0%</b>
<b>TOTAL</b>	<b>120.0%</b>

The most recent study has shown that this is a favorable asset mix for meeting longer-term goals under multiple market conditions. In addition, this study incorporates the “risk parity” concept into OP&F’s asset liability valuation with the goal of reducing equity risk exposure, which reduces overall Total

Portfolio risk without sacrificing return, and creates a more risk-balanced portfolio based on the relationship between asset classes and economic environments. From the notional portfolio perspective above, the Total Portfolio may be levered up to 1.20 times due to the application of leverage in certain fixed income asset classes.

The Asset Allocation Policy represents a long-term strategy and thus, the Total Portfolio should strategically meet its performance objectives in the long-term but not necessarily every year.

Short term market shifts may cause the asset mix to drift from the allocation targets. Should the target percentage fall out of the indicated range for a particular asset class, the staff shall direct rebalancing transactions to reallocate assets from the over-allocated asset class to the under-allocated asset class. This rebalancing discipline is intended to encourage “buying low” and “selling high” and to keep the Total Portfolio invested at an appropriate overall risk level. Except when there is a perceived extraordinary downside risk in a particular asset class, movement outside the normal ranges should be avoided.

Investments in private markets, private credit, private real estate and private real assets are generally less liquid than investments in public markets securities and are typically implemented via periodic commitments to funds with limited partnership structures. As a result, actual allocations to these asset classes may deviate from their strategic targets for extended periods. Actual vs. target deviations for these asset classes shall not be considered in violation of the Asset Allocation Policy. Under/overweights to these asset classes shall be invested in public markets securities with the most similar risk/return characteristics as a short-term proxy for the private asset classes. To assist in rebalancing, OP&F has retained a derivative overlay Investment Manager(s) which provides several benefits including: (1) reduce OP&F’s tracking error relative to target allocations; (2) improve Total Portfolio returns; (3) enhance liquidity, and (4) reduce the administrative burden associated with management of monthly cash flows.

The Board may adopt interim Asset Allocation Policy target allocations to reflect the transition from previous policy target allocations to new policy target allocations. The interim target allocations will reflect dollar cost averaging and/or opportunistic implementation to most prudently reach the new policy target allocations over time.

#### 4. INVESTMENT IMPLEMENTATION

The implementation of an investment portfolio designed to achieve the Total Portfolio objectives must be consistent with governing statutes as specified in Sections 742.11 to 742.113, 742.114, 742.116 and with the Ohio-Qualified Investment

Manager Policy, the Ohio-Qualified Broker Policy, and OP&F's Broker Policy.

Where appropriate, OP&F will invest assets through the use of qualified Investment Manager(s). The allocations to these Investment Manager(s) will be made in accordance with the results of the asset liability valuation study, investment structure analysis, and established procedures. For a complete description of the selection of Investment Manager(s), please see OP&F's Investment Manager Search Policy.

## 5. ASSET CLASS OBJECTIVES, CHARACTERISTICS AND INVESTMENT STRUCTURE

Investment structure targets will be established within applicable asset classes to address risk and return factors present in the respective asset class. For example, the domestic equity composite portfolio structural targets will be established to ensure style (growth vs. value) and market capitalization neutrality relative to the overall market, and to address active versus passive implementation decisions. External Investment Manager(s) will be hired to implement the structural targets in a diversified manner and will therefore have derived target weightings within the overall investment program. Where applicable, these are set forth below.

### A. GROWTH ASSETS

#### 1. DOMESTIC EQUITY

##### *Investment Objectives*

Total return of the domestic equity composite portfolio should exceed the return of the Wilshire 5000 Total Market Index over a full market cycle on an annualized basis. Total return of each Investment Manager'(s) portfolio should rank above the median when compared to their peer group, if applicable, over a full market cycle on an annualized basis and should exceed their benchmark return as specified in each Investment Manager'(s) guidelines or applicable documentation.

##### *Investment Characteristics*

The main focus of investing will be on companies headquartered and/or domiciled in the United States. The domestic equity composite portfolio shall have similar portfolio characteristics as that of the Wilshire 5000 Total Market Index, and should not exhibit size (market capitalization) or style (value vs. growth) bias.

##### *Investment Structure*

The structure of the domestic equity composite portfolio will be diversified among passive and active investment strategies as follows:

##### *a. Passive Large Capitalization Core Exposure*

The passive large capitalization core component has a target allocation of 30% of the domestic equity composite portfolio. This passive portfolio is intended to provide broad market exposure for and diversification to OP&F's domestic equity composite portfolio through holdings in large- and mid- capitalization equities or futures and is to be constructed so as to match the characteristics and return of the Russell 1000 Index.

##### *b. Active Large Capitalization Portable Alpha Exposure*

The active large capitalization portable alpha component has a target allocation of 60% of the domestic equity composite portfolio. The overall objective is to provide risk-adjusted returns greater than the return of the Standard & Poor's (S&P) 500 Index. S&P 500 market exposure, obtained through the use of derivatives and/or physicals, will be combined with strategies that represent diversified sources of alpha with a broad range of risk characteristics. For a complete description of the appropriate use of derivatives, please see OP&F's Derivatives Policy Statement.

##### *c. Active Small Capitalization Core Exposure*

The active small capitalization core component has a target allocation of 7.5% of the domestic equity composite portfolio.

##### *d. Synthetic Small Capitalization Exposure*

The synthetic small capitalization component has a target allocation of 2.5% of the domestic equity composite portfolio.

#### 2. NON-U.S. EQUITY

##### *Investment Objectives*

Total return of the Non-U.S. equity composite portfolio should exceed the return of the Morgan Stanley Capital International All Country World Index ex-U.S. Investible Market Index – Iran and Sudan Free (MSCI ACWI-ex U.S. IMI I/S Free Index) over a full market cycle on an annualized basis. Total return of each Investment Manager'(s) portfolio should rank above the median when compared to their peer group, if applicable, over a full market cycle on an annualized basis and should exceed their benchmark return as specified in each Investment Manager'(s) guidelines or applicable documentation.

##### *Investment Characteristics*

The main focus of investing will be on companies headquartered or domiciled in the MSCI ACWI-ex U.S. IMI countries, which includes both developed and emerging markets. The Non-U.S. Equity composite portfolio shall have similar portfolio characteristics as that of the MSCI ACWI-ex U.S. IMI I/S Free Index.

*Investment Structure*

Non-U.S. equity assets will be managed on an active basis in order to exploit the perceived inefficiencies in the Non-U.S. equity markets. The structure of the Non-U.S. equity composite portfolio will be diversified among active ACWI-ex U.S. strategies and dedicated ACWI-ex U.S. small capitalization strategies as follows:

*a. Active ACWI-ex U.S. Exposure*

The Active ACWI-ex U.S. component has a target allocation of 75% of the Non-U.S. equity composite portfolio.

*b. Active ACWI-ex U.S. Small Capitalization Exposure*

The dedicated Active ACWI-ex U.S. Small Capitalization component has a target allocation of 25% of the Non-U.S. equity composite portfolio.

**3. PRIVATE MARKETS***Investment Objectives*

The performance objectives for the private markets composite portfolio and for individual investments are set forth in OP&F's Private Markets Investment Policy. Both the returns for the private markets composite portfolio and respective benchmark are lagged one quarter.

*Investment Characteristics*

Investments will be diversified by certain criteria as set forth in OP&F's Private Markets Investment Policy.

*Investment Structure*

The target allocation of Total Portfolio assets to private markets will be established by OP&F's long-term Asset Allocation Policy, including a range around the target allocation to allow flexibility as the underlying private markets investments are funded over time. In order to meet this allocation target, the Board of Trustees/Investment Committee approves a private markets investment plan setting forth the proposed investment activity for a specified period of time. The private markets investment plan shall be reviewed at least annually, and more frequently if necessary or appropriate, to reflect market conditions.

**4. HIGH YIELD***Investment Objectives*

Total return of the high yield fixed income composite portfolio should exceed the return of the B of A ML U.S. High Yield Constrained Index over a full market cycle on an annualized basis. Total return of each Investment Manager'(s) portfolio should rank above the median when compared to their peer group, if applicable, over a full market cycle on an annualized basis and should exceed their benchmark return as specified

in each Investment Manager'(s) guidelines or applicable documentation.

*Investment Characteristics*

The main focus of investing will be on below investment grade fixed income securities, those securities rated below BBB- or equivalent. Positions may include publicly traded high yield bonds as well as public and private bank loans. The high yield fixed income composite portfolio shall have similar portfolio characteristics as that of the B of A ML U.S. High Yield Constrained Index. Each Investment Manager'(s) portfolio shall have similar portfolio characteristics as that of their respective benchmark.

*Investment Structure*

High yield fixed income assets will be managed solely on an active basis in order to exploit the perceived inefficiencies in the high yield fixed income markets and to minimize the probability of exposure to securities in default.

**5. PRIVATE CREDIT***Investment Objectives*

The performance objectives for the private credit composite portfolio are set forth in OP&F's Private Credit Investment Policy. Both the returns for the private credit composite portfolio and respective benchmark are lagged one quarter.

*Investment Characteristics*

Investments will be diversified by certain criteria as set forth in OP&F's Private Credit Investment Policy.

*Investment Structure*

The target allocation of Total Portfolio assets to private credit will be established by OP&F's long-term Asset Allocation Policy, including a range around the target allocation to allow flexibility as the underlying private credit investments are funded over time. In order to meet this allocation target, the Board of Trustees/Investment Committee approves a private credit investment plan setting forth the proposed investment activity for a specified period of time. The private credit investment plan shall be reviewed at least annually, and more frequently if necessary or appropriate, to reflect market conditions.

**B. SAFETY ORIENTED ASSETS****1. CORE FIXED INCOME***Investment Objectives*

Total return of the core fixed income composite should exceed the applicable levered return of the Bloomberg Barclays U.S. Aggregate Index minus the cost of financing over a full market

cycle on an annualized basis. Total return of each Investment Manager'(s') portfolio should rank above the median when compared to their peer group, if applicable, over a full market cycle on an annualized basis and exceed their benchmark return as specified in each Investment Manager'(s') guidelines or applicable documentation.

#### *Investment Characteristics*

The main focus of investing will be a diversified mix of traditional fixed income securities. The core fixed income composite portfolio shall have similar portfolio characteristics as that of the Bloomberg Barclays U.S. Aggregate Index.

#### *Investment Structure*

Given the core fixed income allocation target set forth in the Asset Allocation Policy above, the core fixed income composite portfolio will be levered approximately 2.0x, subject to applicable interim Asset Allocation Policy target allocations. The structure of the core fixed income composite portfolio shall be diversified among active investment strategies and synthetic overlays as follows:

##### *a. Active Core Fixed Income Exposure*

The active core fixed income component has a target allocation of 50% of the core fixed income composite portfolio on a notional basis. The overall objective is to provide risk-adjusted returns greater than the return of the Bloomberg Barclays U.S. Aggregate Index.

##### *b. Synthetic Core Fixed Income Exposure*

The synthetic core fixed income component has a target allocation of 50% of the core fixed income composite portfolio on a notional basis. The synthetic core fixed income component shall be implemented to provide either U.S. Treasury exposure or Bloomberg Barclays U.S. Aggregate exposure or some combination of both.

## **2. CASH EQUIVALENTS/ENHANCED CASH**

#### *Investment Objectives*

Cash equivalents are managed with a focus on capital preservation and providing a high degree of liquidity to meet ongoing cash flow needs of the Plan. Total return of the internally managed cash equivalents composite portfolio should exceed the 91-day Treasury bill rate of return over rolling twelve-month periods. Total return of externally managed cash equivalents should meet or exceed a 3-month London Interbank Offered Rate (LIBOR) benchmark over rolling twelve-month periods.

#### *Investment Characteristics*

For internally managed cash, investment guidelines including authorized investments, minimum short-term credit ratings,

portfolio concentration limits and maturity limits for the short-term investment fund (STIF) shall be set forth in OP&F's Short-Term Cash Management Investment Guidelines. In addition, certain specifications including the frequency of credit reviews of approved issuers of commercial paper will be set forth in OP&F's Short-Term Cash Management Investment Guidelines.

For externally managed cash, the portfolio is expected to be invested in cash equivalents consistent with 2a7 money market rules and other short-duration fixed income securities that align with the specific mandate of the Investment Manager(s), including backing derivatives exposure for a total portfolio derivatives overlay program, and being a source of funds for near term benefit payments. Therefore, the portfolio will be managed to maintain a high amount of liquidity and may be laddered to meet cash flow needs.

#### *Investment Structure*

Cash, cash equivalents, and enhanced cash will be actively managed consistent with either OP&F's Short-Term Cash Management Investment Guidelines for internally managed cash, or individual Investment Manager'(s') guidelines for externally managed cash.

## **C. INFLATION HEDGING ASSETS**

### **1. U.S. INFLATION LINKED BONDS (TIPS)**

#### *Investment Objectives*

Total return of the TIPS composite portfolio should exceed two times the Bloomberg Barclays U.S. Government Inflation-Linked Bond Index minus the cost of financing over a full market cycle on an annualized basis. Total return of each Investment Manager'(s') portfolio should exceed their benchmark return as specified in each Investment Manager'(s') guidelines or applicable documentation. In addition, there is a portable alpha component to the TIPS composite portfolio whereas the overall objective is to provide risk-adjusted returns greater than two times the return of the Bloomberg Barclays U.S. Government Inflation-Linked Bond Index minus the cost of financing.

#### *Investment Characteristics*

The main focus of investing will be on U.S. inflation-linked securities. The TIPS composite portfolio, as well as each Investment Manager'(s') portfolio, shall have similar portfolio characteristics as that of the Bloomberg Barclays U.S. Government Inflation-Linked Bond Index.

#### *Investment Structure*

The TIPS allocation will be managed on an active basis. Given the TIPS allocation target set forth in the Asset Allocation Policy above, the TIPS composite portfolio will be levered

approximately 2.0x. TIPS exposure, obtained through the use of derivatives and/or physical bonds, may be combined with a strategy that provides a diversified source of alpha with customized risk tolerances. Implementation of the TIPS composite portfolio will be consistent with OP&F's Derivatives Policy Statement, which provides a complete description of the appropriate use of derivatives in the Plan.

## 2. REAL ESTATE

### *Investment Objectives*

The performance objectives for the real estate composite portfolio are set forth in OP&F's Real Estate Investment Policy. Both the returns for the real estate composite portfolio and respective benchmark(s) are lagged one quarter.

### *Investment Characteristics*

Investments will be diversified by certain criteria as set forth in OP&F's Real Estate Investment Policy.

### *Investment Structure*

The target allocation of Total Portfolio assets to real estate will be established by OP&F's long-term Asset Allocation Policy, including a range around the target allocation to allow flexibility as the underlying private real estate investments are funded over time. In order to meet this allocation target, the Board of Trustees/Investment Committee approves a real estate investment plan setting forth the proposed investment activity for a specified period of time. The real estate investment plan shall be reviewed at least annually, and more frequently if necessary or appropriate, to reflect market conditions.

## 3. REAL ASSETS

### *Investment Objectives*

The performance objectives for the real assets composite portfolio are set forth in OP&F's Real Assets Investment Policy. Both the returns for the real assets composite portfolio and respective benchmark are lagged one quarter.

### *Investment Characteristics*

Real assets investments will be diversified by certain criteria as set forth in OP&F's Real Assets Investment Policy.

### *Investment Structure*

The target allocation of Total Portfolio assets to real assets will be established by OP&F's long-term Asset Allocation Policy, including a range around the target allocation to allow flexibility as the underlying real assets investments are funded over time. In order to meet this allocation target, the Board of Trustees/Investment Committee approves a real assets investment plan setting forth the proposed investment activity for a specified period of time. The real assets investment plan

shall be reviewed at least annually, and more frequently if necessary or appropriate, to reflect market conditions.

## 4. MIDSTREAM ENERGY INFRASTRUCTURE

### *Investment Objectives*

Total return of the midstream energy infrastructure composite portfolio should exceed the return of the Alerian Midstream Energy Index over a full market cycle on an annualized basis. Total return of each Investment Manager's portfolio should rank above the median when compared to their peer group, if applicable, over a full market cycle on an annualized basis and should exceed their benchmark return as specified in each Investment Manager's guidelines or applicable documentation.

### *Investment Characteristics*

The main focus of investing will be on publicly traded midstream energy infrastructure opportunities. Investments may consist of master limited partnerships (MLPs) and securities of energy related C-corporations. The midstream energy infrastructure composite portfolio as well as each Investment Manager's portfolio shall have similar portfolio characteristics as that of the Alerian Midstream Energy Index.

### *Investment Structure*

Midstream energy infrastructure assets will be managed solely on an active basis in order to exploit the perceived inefficiencies in the publicly traded midstream energy infrastructure markets.

## 6. PROXY VOTING

OP&F's Board of Trustees believes that common stock proxies are valuable and should be voted in the long-term interests and objectives of the Plan set forth herein and OP&F's Proxy Voting Policy. Common stock proxies may be executed by the Sr. Investment Officer or the Chief Investment Officer, or their designees. Staff or their designee that exercises a proxy vote shall keep detailed records of said voting of proxies and related actions and will comply with all regulatory obligations related thereto and the policies set forth in OP&F's Proxy Voting Policy. Staff shall provide a semi-annual summary report of proxy voting actions to the Board of Trustees/Investment Committee.

## 7. SECURITIES LENDING

The investment objective for the securities lending program is to generate incremental income within a high quality investment program that safeguards the return of principal, maintains adequate daily liquidity, ensures diversification and tightly controls exposure to fluctuating interest rates. The program may be operated by a bank trustee or a third party lending agent. Marking to market shall be performed daily by the agent(s) and a minimum average of at least 102 percent

for domestic, and 105 percent for Non-U.S. collateral shall be diligently maintained. Securities lending reports shall be provided monthly by the agent(s) to staff. Staff will present a semi-annual summary report to Board of Trustees/Investment Committee.

the fiduciary responsibilities of the Board of Trustees, as set forth in Chapter 742 of the ORC. For a complete description of the responsibilities, process, reporting requirements, etc., please see OP&F's Iran and Sudan Divestment Policy.

## **8. INVESTMENT MANAGER MONITORING AND EVALUATION POLICY**

The purpose of OP&F's Investment Manager Monitoring and Evaluation Policy is to establish the process and discipline for managing the Investment Manager(s) relationship. The policy states the process, responsibilities and important factors for consideration in the monitoring and evaluation process. For a complete description of the monitoring and evaluation process, please see OP&F's Investment Manager Monitoring and Evaluation Policy.

## **9. COMMUNICATIONS**

Each Investment Manager(s) will provide hard copy reports at least quarterly, including performance measurement, asset inventories, transaction summaries, market commentary or anything else deemed significant at the time of reporting. Each Investment Manager(s) is expected to meet or participate via teleconference or webcast with OP&F's Board or staff or Investment Consultant(s) annually or as needed.

## **10. INVESTMENT MANAGER SEARCH POLICY**

When applicable, the selection of Investment Manager(s) will be conducted under a Request for Proposal (RFP) process and the search may be on a closed or open manager universe basis. For a complete description of the selection of Investment Manager(s), please see OP&F's Investment Manager Search Policy.

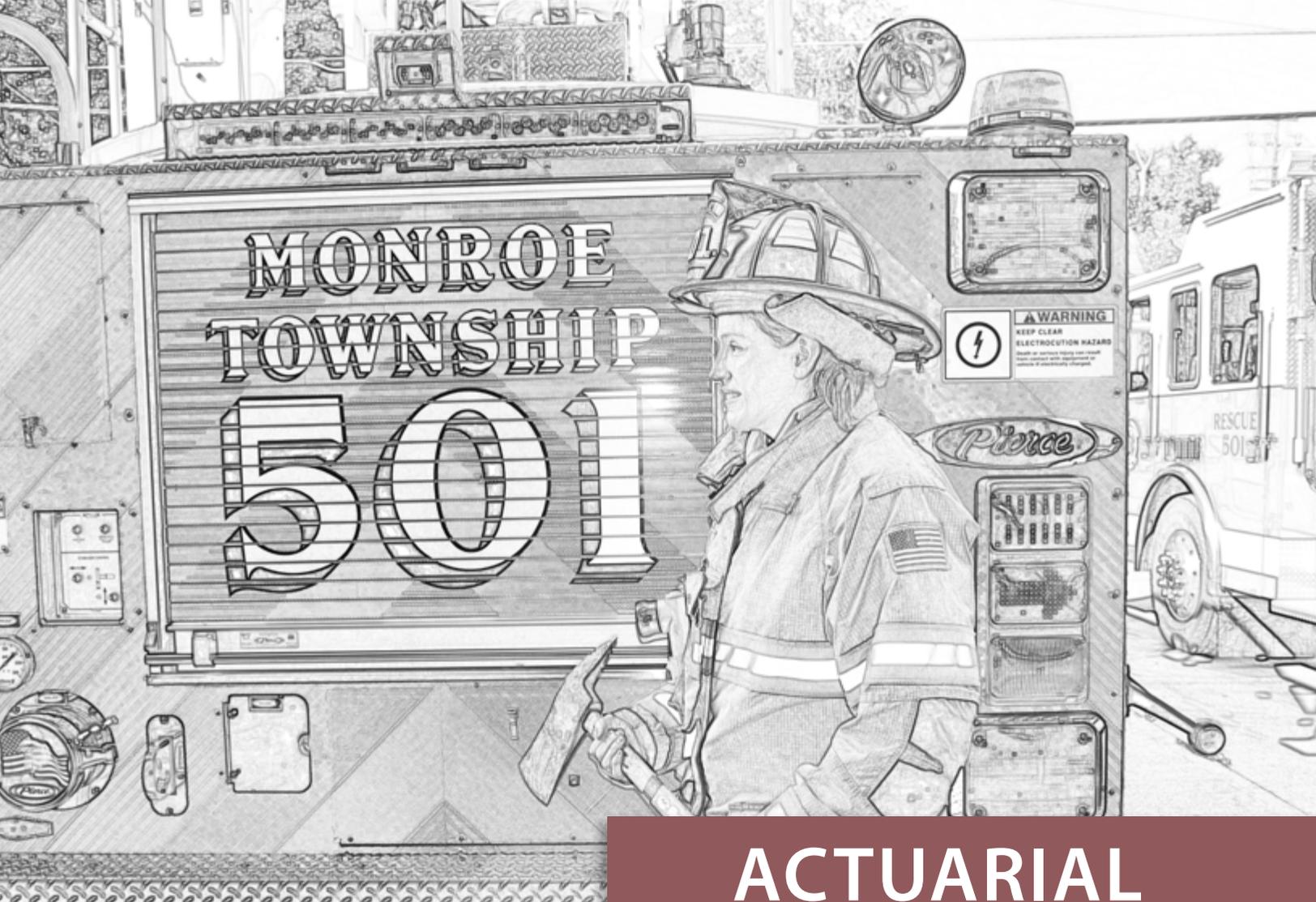
## **11. SECURITIES LITIGATION POLICY**

The Securities Litigation Policy has been adopted to ensure that OP&F takes prudent, effective, appropriate, and efficient actions to protect and increase the value of OP&F investments and to ensure that OP&F receives all money or assets which are due it as a result of the resolution of class action suits in a cost effective manner consistent with the Board's fiduciary duties. For a complete description of the policy objectives, monitoring, reporting requirements, procedures, etc., please see OP&F's Securities Litigation Policy.

## **12. IRAN AND SUDAN DIVESTMENT POLICY**

As required by uncodified provisions of Chapter 742 of the ORC, OP&F has adopted an Iran and Sudan Divestment Policy, the purpose of which is to divest and restrict the purchase of stocks and bonds issued by a publicly traded company with scrutinized business operations in Iran and Sudan, subject to

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# ACTUARIAL

## 2019 COMPREHENSIVE ANNUAL FINANCIAL REPORT

**REPORT OF ACTUARY**

**DESCRIPTION OF ACTUARIAL ASSUMPTIONS  
AND METHODS**

**PLAN SUMMARY**

**ANALYSIS OF FINANCIAL EXPERIENCE – PENSION  
TRUST FUND**

**SHORT-TERM SOLVENCY TEST – PENSION TRUST FUND**

**ACTIVE MEMBER VALUATION DATA – PENSION TRUST  
FUND**

**RETIREES AND BENEFICIARIES ADDED TO AND  
REMOVED FROM ROLLS – PENSION TRUST FUND**

**CALCULATION OF ACTUARIAL VALUE ASSETS –  
PENSION TRUST FUND**

**SCHEDULE OF FUNDING PROGRESS – PENSION  
TRUST FUND**

**EMPLOYER CONTRIBUTION RATES**

**MEMBER CONTRIBUTION RATES**

## REPORT OF ACTUARY



**Cavanaugh Macdonald**  
CONSULTING, LLC  
*The experience and dedication you deserve*

October 2019

Board of Trustees  
Ohio Police & Fire  
Pension Fund 140 East  
Town Street  
Columbus, Ohio  
43215

**Members of the Board:**

Cavanaugh Macdonald (CMC) is pleased to present this report on the results of the actuarial valuation of the Ohio Police & Fire Pension Fund (OP&F). This report presents the results of the annual actuarial valuation of the assets and liabilities of OP&F as of January 1, 2019, prepared in accordance with Chapter 742 of the Ohio Revised Code (ORC), as amended by Senate Bill No. 340. The valuation takes into account all of the promised benefits to which members are entitled, including pension and survivor benefits.

The principal results of the valuation do not take into account Medicare Part B premium reimbursements or any other health care benefits. However, at the request of the Ohio Retirement Study Council (ORSC), supplemental results have been prepared that do take into account the liability for Medicare Part B premium reimbursements and are presented in Table 1A in the report.

The purpose of the valuation is to determine the financial status of OP&F on an actuarial basis. Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. CMC will not accept any liability for any statement made about the report without prior review by CMC.

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

This report does not include accounting disclosure information under Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68. CMC will provide disclosure information under Statement Nos. 67 and 68 in a separate report after OP&F’s 2019 year-end. CMC also prepares a separate valuation of OP&F retiree health care benefits.

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Board of Trustees  
October 2019  
Page 2

The valuation was based on the actuarial assumptions and methods that have been adopted by the Board of Trustees, including a valuation interest rate of 8.00 percent per annum compounded annually. The assumptions were effective January 1, 2017 and recommended by the actuary based on a five-year experience review covering the period 2012-2016. The next experience review will cover the five-year period 2017-2021. Actuarial Standards of Practice require that the likelihood and extent of future mortality improvements be considered. We have reflected future mortality improvement in the valuation.

#### *Assets and Membership Data*

OP&F reported to the actuary the individual data for members as of the valuation date. While we did not verify the data at their source, we did perform tests for internal consistency and reasonableness. The amount of assets in the pension trust fund taken into account in the valuation was based on financial statements prepared for us by OP&F.

An assumption is made by CMC to account for salary adjustments reported by employers assumed to occur after the census information has been provided to CMC by OP&F.

#### *Funding Objectives and Progress*

The actuary uses an actuarial cost method to determine the portion of OP&F's liabilities accrued by the members as of the valuation date and the portion that is attributable to future years of service. The rate of contribution necessary to systematically fund the future service liabilities, the normal cost rate, is calculated under the cost method to be a level percentage of active member payroll. The portion of the liabilities accrued as of the valuation date, the actuarial accrued liability (AAL), is compared to a market-related, actuarial value of OP&F's assets. The amount of liabilities in excess of the assets is called the unfunded actuarial accrued liability (UAAL).

The actuary determines how many years are required by OP&F to completely amortize the UAAL (the funding period), using the member and employer contributions reduced by the amount allocated to health care and the amount of normal cost for the year. For 2003-2012, the funding period was infinite years, meaning the annual contribution toward the unfunded when compared to the unfunded amount was not sufficient to pay it off. As a result of benefit and member contribution changes under Senate Bill No. 340, changes to the DROP program, and a reduction in the contribution allocation to the Health Care Stabilization Fund by the Board of Trustees, and favorable asset investment gains, the pension funding period has decreased from 47 years as of January 1, 2013 to 28 years as of January 1, 2018. As of January 1, 2019, the funding period increased to 29 years.

Section 742.16 of the ORC, as adopted by Senate Bill No. 82, sets forth an objective that the funding period is no more than 30 years. If the funding period exceeds 30 years, a plan shall be developed and presented by the Board of Trustees to the ORSC to reduce the funding period to not more than 30 years. Section 742.14 of the ORC, as amended by Senate Bill No. 340, sets forth that the 30-year funding analysis be performed every three years and the 30-year funding plan, if necessary, be developed and presented not later than 90 days after the Board of Trustees' receipt of the actuarial valuation and 30-year funding analysis. The most recent triennial analysis is based on the January 1, 2019 actuarial valuation, and showed the funding period was 29 years, so no 30-year funding plan is required. The next analysis will be performed based on the January 1, 2022 actuarial valuation.

The funded ratio (i.e., the ratio of actuarial assets to the AAL) determined as of January 1, 2019 is 69.4 percent, compared to 69.9 percent determined as of January 1, 2018. If measured using the market value of



Board of Trustees  
October 2019  
Page 3

assets, the funded ratio would be lower at 65.6 percent on account of net investment losses not yet reflected in the actuarial assets. Taking into account the AAL for Medicare Part B premium reimbursements, the funded ratio would be 68.5 percent using the actuarial assets and 64.7 percent using the market value of assets. The funded ratio is not intended to measure the adequacy of funding in any analysis of a possible settlement of plan liabilities.

#### *Supporting Schedules and Certification*

The valuation report shows detailed summaries of the financial results of the valuation and membership data used in preparing this valuation. The actuary prepared the following supporting schedules for inclusion in the Actuarial and Statistical Sections of the OP&F Comprehensive Annual Financial Report: Analysis of Financial Experience, Short-Term Solvency Test, Schedule of Funding Progress, Calculation of Actuarial Value of Assets, and Retirees and Beneficiaries Added to and Removed from the Rolls.

The valuation assumptions were chosen by the Board of Trustees with the advice of the actuary. The assumptions used to develop the January 1, 2019 valuation are individually reasonable and in combination represent our best estimate of anticipated experience under the plan.

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

The consultants who worked on this assignment are pension actuaries. CMC's advice is not intended to be a substitute for qualified legal or accounting counsel.

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries, have experience in performing valuations for public retirement plans, and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board and the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement plan and on actuarial assumptions that are internally consistent and reasonable based on the actual experience of the Fund and future expectations. However, the Board of Trustees has the final decision regarding the selection of the assumptions and adopted them as indicated in Appendix C.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'L Langer'.

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

A handwritten signature in blue ink, appearing to read 'Patrice Beckham'.

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

## DESCRIPTION OF ACTUARIAL ASSUMPTIONS AND METHODS

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% 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% per annum, compounded annually, consisting of inflation rate of 2.75% plus productivity increase rate of 0.5%

### DROP INTEREST CREDITING RATE

4.0 % per annum, compounded annually.

### CPI-BASED COLA

2.2% simple for increases based on the lesser of the increase in CPI and 3.0%.

**WITHDRAWAL RATES**

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

**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%

**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%

**RETIREMENT RATES**

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

<b>Age</b>	<b>Police</b>	<b>Firefighter</b>
48	-%	-%
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% of members who do not retire when first eligible are assumed to elect DROP.

**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%							
49	4%	5%							
50	4%	5%	4%						
51	4%	5%	4%	10%					
52	3%	5%	4%	9%	9%				
53	3%	5%	4%	9%	8%	12%			
54	4%	5%	5%	10%	9%	13%	13%		
55	5%	5%	5%	16%	16%	14%	18%	44%	
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**

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.

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%

**FIREFIGHTER**

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.

**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% 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**

A 1.261% load is added to the 2018 reported salaries to account for salaries accrued but not reported for the valuation. This adjustment is based on an average of plan experience from the prior three years. The raw adjustment rates for each year are as follows:

Pay for Calendar Year	Raw Adjustment
2018	1.256%
2017	0.919%
2016	1.608%

This adjustment will be reviewed annually for future late reported salaries.

**PERCENT MARRIED**

75% 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% of service retirees and 10% of disability retirees are assumed to elect the 40% 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% Joint and Survivor pension is assumed to be 14.36% for disability retirees and 10.50% 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% receiving lump sums, 30% receiving installments over two years, and 45% 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 2019) provided the retiree is not eligible for reimbursement from any other sources.

88% 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%, 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% or more than 120% 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.

## PLAN SUMMARY

### 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% of salary; employers of firefighters pay 24% of salary. The member contribution rate equals 12.25% in 2019.

### EMPLOYER CONTRIBUTION RATES – PERCENTAGE OF ACTIVE MEMBER PAYROLL:

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

### MEMBER CONTRIBUTION RATES – PERCENTAGE OF ACTIVE MEMBER PAYROLL:

Time Frame of Rates	Police	Fire
July 2, 2015 thru Present	12.25%	12.25%

## 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.

#### BENEFIT

An annual pension equal to a percentage of the allowable average annual salary. The percentage equals 2.5% for each of the first 20 years of service, 2.0% for each of the next five years of service, and 1.5% for each year of service in excess of 25 years. The maximum pension of 72% 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 have elapsed from the date of their full-time hire.

**BENEFIT**

An annual pension equal to 1.5% 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 (up to 25 years of service credit).

**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.

**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.

## 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.

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
Year 4-5	75% of member's contribution
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 contribution
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 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% 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.

#### **PERMANENT AND TOTAL DISABILITY (ON-DUTY)**

##### **ELIGIBILITY**

No age or service requirement.

##### **BENEFIT**

An annual benefit equal to 72% 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% 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% 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% joint and survivor annuity, calculated under the assumption that the decedent had retired effective the day following his/her death.

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## 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.

#### *Surviving Child's Benefit*

An annual amount equal to \$1,800 (\$150 monthly), payable until such child attains age 22 or marries, whichever occurs first. 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.

Survivors	Monthly Pension	Causes of Termination
Widow / Widower	current amount + future COLA	* Death
Child	current amount + future COLA	* Death * Marriage * Attainment of age 22
Dependent disabled child	current amount + future COLA	* Death * Recovery from disability
One dependent parent	current amount + future COLA	* Death * Re-marriage
Two dependent parents	½ current amount (each) + future COLA	* Termination of dependency

Benefit Type	Base Monthly Benefit Amount	Base Monthly Benefit Amount Plus Increases Through July 1, 2018	Monthly Increases Effective July 1, 2019
Spouse	\$550	\$859.10 *	\$16.50
Child	150	234.30 **	4.50
One Parent	200	312.40 ***	6.00
Two Parents	100	156.20	3.00

\* 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.

## 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.

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% JSA payable to the spouse.

## 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. Depending on the optional annuity plan selected, a member's beneficiary(ies) may receive benefit payments upon the member's death.

### 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% 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% JSA payable to the spouse.

## 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% 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% 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% 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 single life annuity

### 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.

#### **HEALTH CARE STIPEND AND MEDICARE**

Although support for retiree health care is not a vested right and is a discretionary benefit from OP&F subject to change at any time, the Board of Trustees has elected to continue to sponsor a plan for the last 45 years.

Beginning in 1974, OP&F sponsored a group health care program for retirees and their dependents by covering all or part of the plan premiums, in addition to paying all claims. Although several changes were made throughout the years, this group plan was in existence until Dec. 31, 2018.

Effective July 1992, retirees and survivors made monthly medical benefit contributions which are credited to the Health Care Stabilization Fund (HCSF). These contributions were 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 then paid a percentage of the full cost of the benefit based on the year of retirement. Due to the rising cost of health care and the primary source requirements of pension reform legislation enacted in 2013, OP&F is no longer able to offer a plan as in the past. On Dec. 31, 2018, the group health care plan ended.

On Jan. 1, 2019, a stipend-based health care model replaced the self-insured group health care plan. OP&F contracted with a vendor who assists eligible retirees in choosing health care plans that are available where they live (both Medicare-eligible and pre-65 populations). A stipend funded by OP&F is available to these members through a Health Reimbursement Arrangement and can be used to reimburse retirees for qualified health care expenses. As a result of this change, it is expected that the solvency of the HCSF will be extended allowing OP&F to provide stipends to eligible participants.

Regardless of a benefit recipient's participation in the health care program, OP&F is required by-law to pay eligible recipients of a service pension, disability benefit and spousal survivor benefit for a portion of their Medicare Part B insurance premium, up to the statutory maximum provided the benefit recipient is not eligible to receive reimbursement from any other source. Once OP&F receives the necessary documentation, a monthly reimbursement is included as part of the recipient's next benefit payment.

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

## ANALYSIS OF FINANCIAL EXPERIENCE - PENSION TRUST FUND

### GAIN/(LOSS) AS OF JAN. 1, 2019

Type of Activity	Experience Gain (Loss)
<b>Plan experience:</b>	
<b>Turnover</b>	<b>\$(3,121,347)</b>
If more liabilities are released by withdrawal separations from active membership than assumed, there is a gain. If smaller releases, there is a loss.	
<b>Retirement</b>	<b>32,335,086</b>
If members retire at older ages than assumed, there is a gain. If younger, there is a loss.	
<b>Death among retired members and beneficiaries</b>	<b>8,808,719</b>
If more deaths occur than assumed, there is a gain. If fewer deaths than assumed, there is a loss.	
<b>Disability Retirements</b>	<b>12,441,861</b>
If disability claims are less than assumed, there is a gain. If more claims, there is a loss.	
<b>Salary increase/decrease</b>	<b>149,203,045</b>
If there are smaller pay increases than assumed, there is a gain. If greater increases, there is a loss.	
<b>Return to work</b>	<b>(11,066,219)</b>
If participants return to work with previous service restored, there is a loss.	
<b>New Entrants</b>	<b>(7,984,831)</b>
If new entrants join OP&F, there is a loss.	
<b>Deaths among actives</b>	<b>(1,393,575)</b>
If claim costs are less than assumed, there is a gain. If more claim costs, there is a loss.	
<b>Investment</b>	<b>(429,920,888)</b>
If there is a greater investment return than assumed, there is a gain. If less return, there is a loss.	
<b>Change in Actuary</b>	<b>(69,747,583)</b>
Difference between CMC results and the prior actuary's results.*	
<b>Other Experience and Payroll Growth</b>	<b>237,392,859</b>
If other experience, including less than expected payroll growth, increases the unfunded liability, there is a loss. Otherwise, there is a gain.	
<b>NET GAIN (OR LOSS) DURING THE YEAR DUE TO PLAN EXPERIENCE</b>	<b>\$(83,052,873)</b>

\* CMC = Cavanaugh Macdonald Consulting, LLC

### SHORT-TERM SOLVENCY TEST

A short-term solvency test is one means of checking a system's progress under its funding program. In a short-term solvency test, the plan's valuation assets are compared with: (1) Active member contributions on deposit; (2) The liability for future benefits to present retired lives; (3) The liability for service already rendered by active members. In a system that has been following the discipline of level percent of payroll financing, the liability for active member contributions on deposit (liability 1) and the liabilities for future benefits

to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of present assets. Generally, if the system has been using level cost financing, the funding portion of the liability 3 will increase over time. Liability 3 being fully funded is very rare.

## SHORT-TERM SOLVENCY TEST - PENSION TRUST FUND (DOLLARS IN THOUSANDS)

	Valuation as of Jan. 1	(1)	(2)	(3)	Valuation Assets	Portion of Accrued Liabilities Covered by Valuation Assets		
		Active Member Contributions	Retirants and Beneficiaries	Active Members (Employer Financed Portion)		(1)	(2)	(3)
Police	2019	\$1,584,057	\$7,107,922	\$2,987,107	\$8,102,788	100%	92%	-%
Fire	2019	1,423,619	5,373,749	2,788,255	6,650,372	100%	97%	-%
Police	2018	1,515,993	6,870,423	3,138,109	8,052,548	100%	95%	-%
Fire	2018	1,345,237	5,150,080	2,867,386	6,542,014	100%	100%	2%
Police	2017	1,451,473	6,576,192	3,184,383	7,825,895	100%	97%	-%
Fire	2017	1,276,582	4,922,990	2,878,774	6,336,593	100%	100%	5%
Police	2016	1,386,649	6,085,896	3,002,889	7,473,979	100%	100%	-%
Fire	2016	1,213,330	4,614,250	2,832,862	6,179,025	100%	100%	12%
Police	2015	1,210,400	5,857,146	3,015,390	7,141,575	100%	100%	2%
Fire	2015	1,062,097	4,337,819	2,912,741	5,887,716	100%	100%	17%
Police	2014	1,171,496	5,368,637	2,583,711	6,088,816	100%	92%	-%
Fire	2014	1,028,465	3,924,388	2,501,058	4,974,383	100%	100%	1%
Police	2013	1,131,664	5,166,808	2,532,580	5,670,069	100%	88%	-%
Fire	2013	974,362	3,751,279	2,451,195	4,607,962	100%	97%	-%
Police	2012	1,100,146	4,960,051	2,969,900	5,694,783	100%	93%	-%
Fire	2012	965,598	3,581,800	2,769,204	4,614,176	100%	100%	2%
Police	2011	1,100,251	4,368,659	3,008,219	5,885,449	100%	100%	14%
Fire	2011	956,559	3,132,521	2,818,228	4,795,563	100%	100%	25%
Police	2010	1,067,209	4,216,219	2,926,199	5,975,121	100%	100%	24%
Fire	2010	916,033	3,004,267	2,700,815	4,818,972	100%	100%	33%

## ACTIVE MEMBER VALUATION DATA - PENSION TRUST FUND

Valuation as of Jan. 1	Number of Employers		Number of Active Members*		Average Annual Salary		Percentage of Average Annual Salary Increases		Annual Payroll (Millions)
	Police	Fire	Police	Fire	Police	Fire	Police	Fire	
2019	526	408	15,630	13,457	\$77,544	\$79,579	1.5%	2.2%	\$2,218.0
2018	528	398	15,214	13,194	76,397	77,870	0.8%	0.4%	2,209.3
2017	530	396	15,205	12,970	75,772	77,583	3.8%	4.5%	2,180.9
2016	527	388	14,846	12,778	72,976	74,229	4.2%	4.2%	2,060.9
2015	529	388	14,919	12,850	70,033	71,228	1.9%	1.6%	1,986.6
2014	532	386	14,841	12,764	68,724	70,087	0.8%	1.0%	1,942.3
2013	531	380	14,745	12,699	68,163	69,360	1.6%	1.0%	1,913.4
2012	537	380	14,854	12,769	67,094	68,663	2.2%	1.6%	1,897.4
2011	533	384	15,293	12,929	65,649	67,559	2.0%	2.0%	1,868.5
2010	536	385	15,581	13,038	64,373	66,223	1.4%	1.7%	1,895.2

\* Includes rehired retirees.

## RETIREES AND BENEFICIARIES ADDED TO AND REMOVED FROM ROLLS - PENSION TRUST FUND (DOLLARS IN THOUSANDS)

Year Ended Dec. 31	Added to rolls		Removed from rolls		Rolls end of year		Percentage Change in Allowance	Average Annual Allowances	Percentage Change in Membership
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances			
2018	1,292	\$66,129	1,087	\$28,036	29,566	\$1,105,862	3.57%	\$37.40	0.70%
2017	1,458	50,476	1,010	24,321	29,361	1,067,769	4.53%	36.37	1.55%
2016	1,401	47,436	890	21,186	28,913	1,021,509	4.67%	35.33	1.80%
2015	1,450	48,864	1,011	22,141	28,402	975,929	4.81%	34.36	1.57%
2014	1,261	41,378	859	17,204	27,963	931,176	4.59%	33.30	1.46%
2013	1,362	44,842	1,044	23,851	27,561	890,288	4.42%	32.30	1.17%
2012	1,390	48,249	1,225	19,469	27,243	852,602	5.58%	31.30	0.61%
2011	1,783	65,572	779	16,397	27,078	807,550	8.52%	29.82	3.85%
2010	1,165	34,553	803	15,721	26,074	744,144	4.74%	28.54	1.41%
2009	1,128	30,920	733	14,566	25,712	710,463	4.52%	27.63	1.56%

## CALCULATION OF ACTUARIAL VALUE OF ASSETS - PENSION TRUST FUND

Item	Amount				
1. Market Value of Assets as of Dec. 31, 2018	\$13,941,056,807				
2. Determination of Deferred Gain (Loss)					
<b>Return on Market Value of Assets</b>					
<b>Year</b>	<b>Actual</b>	<b>Expected</b>	<b>Gain/(Loss)</b>	<b>Percentage Deferred</b>	<b>Deferred Amount</b>
2018	\$(460,216,086)	\$1,174,313,569	\$(1,634,529,655)	75%	\$(1,225,897,241)
2017	1,808,150,698	1,073,514,102	734,636,596	50%	367,318,298
2016	1,232,569,108	1,046,667,736	185,901,372	25%	46,475,343
2015	(11,259,198)	1,088,245,528	(1,099,504,726)	-%	-
Total Deferred Gain (Loss)					(812,103,600)
Total Deferred Loss					(812,103,600)
3. Adjustment for 20% corridor					-
4. Actuarial Value of Assets available for benefits (1) - (2) + (3)					\$14,753,160,407

## SCHEDULE OF FUNDING PROGRESS - PENSION TRUST FUND

FOR THE VALUATION YEAR ENDING JAN. 1, 2019  
(DOLLARS IN MILLIONS)\*

Valuation Year Jan. 1	Valuation Assets *	Actuarial Accrued Liabilities (AAL)	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Active Member Payroll	UAAL as a Percentage of Active Member Payroll
2019	\$14,753.2	\$21,264.7	\$6,511.5	69.4%	\$2,218.0	293.6%
2018	14,594.6	20,887.2	6,292.6	69.9%	2,209.3	284.8%
2017	14,162.5	20,290.4	6,127.9	69.8%	2,180.9	281.0%
2016	13,653.0	19,135.9	5,482.9	71.3%	2,060.9	266.1%
2015	13,029.3	18,395.6	5,366.3	70.8%	1,986.6	270.1%
2014	11,063.2	16,577.8	5,514.6	66.7%	1,942.3	283.9%
2013	10,278.0	16,007.9	5,729.9	64.2%	1,913.4	299.5%
2012	10,309.0	16,346.7	6,037.7	63.1%	1,897.4	318.2%
2011	10,681.0	15,384.4	4,703.4	69.4%	1,868.5	251.7%
2010	10,794.1	14,830.7	4,036.6	72.8%	1,895.2	213.0%

\* The amounts reported in this schedule do not include assets or liabilities for post-employment health care benefits.

## EMPLOYER CONTRIBUTION RATES (1967 - PRESENT)\*

Time Frame of Rates	Employer Rates	
	Police	Fire
Jan. 1, 1986 thru Present	19.50%	24.00%
Jan. 1, 1985 thru Dec. 31, 1985	20.03%	24.59%
Jan. 1, 1984 thru Dec. 31, 1984	21.35%	24.59%
Jan. 1, 1983 thru Dec. 31, 1983	18.45%	23.57%
Jan. 1, 1982 thru Dec. 31, 1982	16.62%	22.39%
Jan. 1, 1981 thru Dec. 31, 1981	15.60%	20.72%
Jan. 1, 1980 thru Dec. 31, 1980	15.70%	19.87%
Jan. 1, 1979 thru Dec. 31, 1979	18.40%	20.11%
Jan. 1, 1978 thru Dec. 31, 1978	17.53%	18.90%
Jan. 1, 1977 thru Dec. 31, 1977	15.34%	16.77%
Jan. 1, 1976 thru Dec. 31, 1976	14.02%	15.57%
Jan. 1, 1975 thru Dec. 31, 1975	12.49%	13.78%
Jan. 1, 1974 thru Dec. 31, 1974	12.88%	13.60%
Jan. 1, 1973 thru Dec. 31, 1973	12.85%	13.41%
Jan. 1, 1972 thru Dec. 31, 1972	12.96%	13.26%
Jan. 1, 1971 thru Dec. 31, 1971	12.81%	12.96%
Jan. 1, 1970 thru Dec. 31, 1970	15.52%	15.52%
Jan. 1, 1969 thru Dec. 31, 1969	14.68%	14.49%
Jan. 1, 1968 thru Dec. 31, 1968	13.66%	13.50%
Jan. 1, 1967 thru Dec. 31, 1967	13.55%	13.13%

\* For employer billing purposes, the September 1988 billing was carried through Sept. 30, 1988 and was not cut off at Sept. 8, 1988. The same goes for the employee rates for the most part.

## MEMBER CONTRIBUTION RATES

Time Frame of Rates	Member Rates	
	Police	Fire
July 2, 2015 thru Present	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%
Aug. 1, 1986 thru Sept. 8, 1988	9.50%	9.50%
March 1, 1980 thru July 31, 1986	8.50%	8.50%
Jan. 1, 1968 thru Feb. 28, 1980	7.00%	7.00%
Jan. 1, 1967 thru Dec. 31, 1967	6.00%	6.00%

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# STATISTICAL

2019 COMPREHENSIVE ANNUAL  
FINANCIAL REPORT

## **STATISTICAL OBJECTIVES**

### **FINANCIAL TRENDS**

Changes in Fiduciary Net Position  
Revenues by Source  
Expenses by Type  
Benefit Expenses by Type  
DROP Program Balances

### **REVENUE CAPACITY INFORMATION**

Active Member and Total Payroll Base Statistics  
Active Membership Data  
Retired Membership by Type of Benefits  
Retirees and Beneficiaries Statistics  
Average Monthly Benefit Payments  
Member Health Care Premium Contributions  
State of Ohio Subsidy Payments  
OP&F's Cost-of-Living Allowance (COLA) History  
Employer Contribution Rates  
Member Contribution Rates  
Health Care Allocation Rates from Employer Contributions  
Actuarial Interest Rates

DROP and Re-employed Interest Rates

DROP Member Count Roll Forward

Actuarial Valuation Information – Pension Trust Fund

Historical Annual Investment Results

### **DEBT CAPACITY INFORMATION**

### **DEMOGRAPHIC AND ECONOMIC INFORMATION**

Number of Employer Units

### **OPERATING INFORMATION**

Retired Membership by Type of Benefits and Average Annual Allowance

Schedule of Average Benefits

Principal Participating Employers

OP&F Employee Budgeted Position Counts

Personnel Salaries by Year

OP&F Budget

Other Operating Statistics

Death Benefit Fund

### **LIST OF PROFESSIONAL ACRONYMS AND SYMBOLS**

## STATISTICAL OBJECTIVES

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The objectives of the statistical section are to provide additional historical perspective, context and relevant details to assist readers in using information in the financial statements, notes to the financial statements and RSI in order to understand and assess OP&F's overall financial condition. In support of these objectives, OP&F reports information in this section in compliance with GASB Statement 44, Economic Condition Reporting: The Statistical Section. This statement establishes standardized reporting requirements relative to the supplementary information provided in this section.

The schedules that follow show financial trend information about the growth of OP&F's assets for the past 10 years. These schedules provide detailed information about the trends of key sources of additions and deductions to OP&F's assets, which assist in providing a context framing how OP&F's financial position has changed over time. The financial trend schedules presented are:

- Changes in Fiduciary Net Position.
- Revenues by Source.
- Expenses by Type.
- Benefit Expenses by Type.
- DROP Program Balances.

The schedules beginning on page 122 show revenue capacity information, demographic and economic information and operating information. The demographic and economic information is designed to assist in understanding the environment in which OP&F operates. The operating information is intended to provide contextual information about OP&F's operations to assist in assessing OP&F's economic condition. The revenue capacity information, the demographic and economic information and the operating information presented include:

- Active Member and Total Payroll Base Statistics.
- Active Membership Data.
- Retired Membership by Type of Benefits.
- Retirees and Beneficiaries Statistics.
- Average Monthly Benefit Payments.
- Member Health Care Contributions.
- State of Ohio Subsidy Payments.
- OP&F's Cost-of-Living Allowance (COLA) History.
- Employer Contribution Rates.
- Member Contribution Rates.

- Health Care Allocation Rates from Employer Contributions.
- Actuarial Interest Rates.
- DROP and Reemployed Interest Rates.
- DROP Member Count Roll Forward.
- Actuarial Valuation Information – Pension Trust Fund.
- Historical Annual Investment Results.
- Number of Employer Units.
- Retired Membership by Type of Benefits and Average Annual Allowance.
- Schedule of Average Benefits.
- Principal Participating Employers.
- OP&F Employee Budgeted Position Counts.
- Personnel Salaries by Year.
- OP&F Budget.
- Other Operating Statistics.
- Death Benefit Fund.

To help readers of this CAFR, OP&F has added a List of Professional Acronyms and Symbols at the end of the statistical section.

## FINANCIAL TRENDS

### CHANGES IN FIDUCIARY NET POSITION COMBINED TRUST FUND (DOLLARS IN MILLIONS)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
<b>Additions</b>										
Employer Contributions	\$514.3	\$489.9	\$473.2	\$465.4	\$438.7	\$427.8	\$418.2	\$417.0	\$407.5	\$414.0
Member Contributions and Purchases	303.4	295.5	282.0	268.6	245.8	224.0	211.4	177.5	176.8	175.5
Investment Income	2,434.3	(487.9)	1,923.5	1,317.4	(10.0)	860.7	2,053.0	1,657.9	229.6	1,651.8
Health Care Contributions	0.5	73.2	74.5	73.2	71.2	70.0	66.6	65.1	62.5	58.9
Other Revenues	20.5	24.9	28.6	36.3	29.2	25.2	28.5	30.7	40.5	25.8
<b>TOTAL ADDITIONS</b>	<b>3,273.0</b>	<b>395.6</b>	<b>2,781.8</b>	<b>2,160.9</b>	<b>774.9</b>	<b>1,607.7</b>	<b>2,777.7</b>	<b>2,348.2</b>	<b>916.9</b>	<b>2,326.0</b>
<b>Deductions</b>										
Benefit Payments	1,457.1	1,514.1	1,429.2	1,396.4	1,369.9	1,310.5	1,302.5	1,236.4	1,204.2	1,132.1
Refund of Member Contributions	13.7	18.3	20.6	14.2	13.8	15.2	16.0	26.5	22.0	15.8
Administrative Expenses	21.8	17.0	20.3	19.6	16.3	16.2	15.9	15.4	15.4	15.1
<b>TOTAL DEDUCTIONS</b>	<b>1,492.6</b>	<b>1,549.4</b>	<b>1,470.1</b>	<b>1,430.2</b>	<b>1,400.0</b>	<b>1,341.9</b>	<b>1,334.4</b>	<b>1,278.3</b>	<b>1,241.6</b>	<b>1,163.0</b>
<b>CHANGES IN FIDUCIARY NET POSITION</b>	<b>1,780.4</b>	<b>(1,153.8)</b>	<b>1,311.7</b>	<b>730.7</b>	<b>(625.1)</b>	<b>265.8</b>	<b>1,443.3</b>	<b>1,069.9</b>	<b>(324.7)</b>	<b>1,163.0</b>
<b>FIDUCIARY NET POSITION - BEGINNING OF YEAR</b>	<b>\$14,734.9</b>	<b>\$15,888.7</b>	<b>\$14,577.0*</b>	<b>\$13,853.3</b>	<b>\$14,478.4**</b>	<b>\$14,219.6</b>	<b>\$12,776.3***</b>	<b>\$10,468.5</b>	<b>\$10,793.2</b>	<b>\$9,630.2</b>
<b>FIDUCIARY NET POSITION - END OF YEAR</b>	<b>\$16,515.3</b>	<b>\$14,734.9</b>	<b>\$15,888.7</b>	<b>\$14,584.0</b>	<b>\$13,853.3</b>	<b>\$14,485.4</b>	<b>\$14,219.6</b>	<b>\$11,538.4</b>	<b>\$10,468.5</b>	<b>\$10,793.2</b>
<b>Reserve Fund Balances:</b>										
Employers' Contribution Reserves	\$883.3	\$(291.5)	\$1,535.3	\$1,155.8	\$1,058.3	\$2,701.1	\$2,907.9	\$873.8	\$901.6	\$1,515.9
Members' Contribution Reserves	3,150.3	3,005.9	2,861.2	2,728.1	2,600.0	2,491.3	2,393.7	2,122.8	2,065.8	2,056.8
Health Care Contribution Reserves	878.7	793.8	932.1	901.6	929.4	1,031.9	1,053.5	935.6	780.1	717.7
Pension Reserves	11,603.0	11,226.7	10,560.1	9,798.5	9,265.6	8,261.1	7,864.5	7,606.2	6,721.0	6,502.8
<b>TOTAL FIDUCIARY NET POSITION</b>	<b>\$16,515.3</b>	<b>\$14,734.9</b>	<b>\$15,888.7</b>	<b>\$14,584.0</b>	<b>\$13,853.3</b>	<b>\$14,485.4</b>	<b>\$14,219.6</b>	<b>\$11,538.4</b>	<b>\$10,468.5</b>	<b>\$10,793.2</b>

\* Net Position was restated due to the implementation of GASB 75 during 2018.

\*\* Net Position was restated due to the implementation of GASB 68 during 2015.

\*\*\* Net Position was restated due to the implementation of GASB 67 during 2014.

## CHANGES IN FIDUCIARY NET POSITION PENSION TRUST FUND (DOLLARS IN MILLIONS)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
<b>Additions</b>										
Employer Contributions	\$502.3	\$478.6	\$462.3	\$454.7	\$428.5	\$418.0	\$349.5	\$286.7	\$278.2	\$285.2
Member Contributions and Purchases	303.4	295.5	282.0	268.6	245.8	224.0	211.4	177.5	176.8	175.5
Investment Income	2,304.3	(460.3)	1,808.1	1,232.6	(16.7)	779.8	1,893.9	1,531.0	210.6	1,551.3
Health Care Contributions	-	-	-	-	-	-	-	-	-	-
Other Revenues	0.9	1.5	4.5	8.4	5.9	7.2	12.9	9.5	11.9	9.1
<b>TOTAL ADDITIONS</b>	<b>3,110.9</b>	<b>315.3</b>	<b>2,556.9</b>	<b>1,964.3</b>	<b>663.5</b>	<b>1,429.0</b>	<b>2,467.7</b>	<b>2,004.7</b>	<b>677.5</b>	<b>2,021.1</b>
<b>Deductions</b>										
Benefit Payments	1,380.3	1,296.2	1,235.6	1,172.8	1,156.7	1,110.9	1,111.2	1,049.0	1,027.9	972.2
Refund of Member Contributions	13.7	18.3	20.6	14.2	13.8	15.2	16.0	26.5	22.0	15.8
Administrative Expenses	21.4	16.3	19.5	18.8	15.6	15.5	15.1	14.8	14.7	14.4
<b>TOTAL DEDUCTIONS</b>	<b>1,415.4</b>	<b>1,330.8</b>	<b>1,275.7</b>	<b>1,205.8</b>	<b>1,186.1</b>	<b>1,141.6</b>	<b>1,142.3</b>	<b>1,090.3</b>	<b>1,064.6</b>	<b>1,002.4</b>
<b>CHANGES IN FIDUCIARY NET POSITION</b>	<b>1,695.5</b>	<b>(1,015.5)</b>	<b>1,281.2</b>	<b>758.5</b>	<b>(522.6)</b>	<b>287.4</b>	<b>1,325.4</b>	<b>914.4</b>	<b>(387.1)</b>	<b>1,018.7</b>
<b>FIDUCIARY NET POSITION - BEGINNING OF YEAR</b>	<b>\$13,941.1</b>	<b>\$14,956.6</b>	<b>\$13,675.4*</b>	<b>\$12,923.9</b>	<b>\$13,446.5**</b>	<b>\$13,166.1</b>	<b>\$11,840.7***</b>	<b>\$9,688.4</b>	<b>\$10,075.5</b>	<b>\$9,056.8</b>
<b>FIDUCIARY NET POSITION - END OF YEAR</b>	<b>\$15,636.6</b>	<b>\$13,941.1</b>	<b>\$14,956.6</b>	<b>\$13,682.4</b>	<b>\$12,923.9</b>	<b>\$13,453.5</b>	<b>\$13,166.1</b>	<b>\$10,602.8</b>	<b>\$9,688.4</b>	<b>\$10,075.5</b>
<b>Reserve Fund Balances:</b>										
Employers' Contribution Reserves	\$883.3	\$(291.5)	\$1,535.3	\$1,155.8	\$1,058.3	\$2,701.1	\$2,907.9	\$873.8	\$901.6	\$1,515.9
Members' Contribution Reserves	3,150.3	3,005.9	2,861.2	2,728.1	2,600.0	2,491.3	2,393.7	2,122.8	2,065.8	2,056.8
Pension Reserves	11,603.0	11,226.7	10,560.1	9,798.5	9,265.6	8,261.1	7,864.5	7,606.2	6,721.0	6,502.8
<b>TOTAL FIDUCIARY NET POSITION</b>	<b>\$15,636.6</b>	<b>\$13,941.1</b>	<b>\$14,956.6</b>	<b>\$13,682.4</b>	<b>\$12,923.9</b>	<b>\$13,453.5</b>	<b>\$13,166.1</b>	<b>\$10,602.8</b>	<b>\$9,688.4</b>	<b>\$10,075.5</b>

\* Net Position was restated due to the implementation of GASB 75 during 2018.

\*\* Net Position was restated due to the implementation of GASB 68 during 2015.

\*\*\* Net Position was restated due to the implementation of GASB 67 during 2014.

## CHANGES IN FIDUCIARY NET POSITION

### RETIREE HEALTH CARE TRUST FUND (DOLLARS IN MILLIONS)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
<b>Additions</b>										
Employer Contributions	\$12.0	\$11.3	\$10.9	\$10.7	\$10.2	\$9.8	\$68.7	\$130.3	\$129.3	\$128.8
Member Contributions and Purchases	-	-	-	-	-	-	-	-	-	-
Investment Income	130.0	(27.6)	115.4	84.8	6.7	80.9	159.1	126.9	19.0	100.5
Health Care Contributions	0.5	73.2	74.5	73.2	71.2	70.0	66.6	65.1	62.5	58.9
Other Revenues	19.6	23.4	24.1	27.9	23.3	18.0	15.6	21.2	28.6	16.7
<b>TOTAL ADDITIONS</b>	<b>162.1</b>	<b>80.3</b>	<b>224.9</b>	<b>196.6</b>	<b>111.4</b>	<b>178.7</b>	<b>310.0</b>	<b>343.5</b>	<b>239.4</b>	<b>304.9</b>
<b>Deductions</b>										
Benefit Payments	76.8	217.9	193.6	223.6	213.2	199.6	191.3	187.4	176.3	159.9
Refund of Member Contributions	-	-	-	-	-	-	-	-	-	-
Administrative Expenses	0.4	0.7	0.8	0.8	0.7	0.7	0.8	0.6	0.7	0.7
<b>TOTAL DEDUCTIONS</b>	<b>77.2</b>	<b>218.6</b>	<b>194.4</b>	<b>224.4</b>	<b>213.9</b>	<b>200.3</b>	<b>192.1</b>	<b>188.0</b>	<b>177.0</b>	<b>160.6</b>
<b>CHANGES IN FIDUCIARY NET POSITION</b>	<b>84.9</b>	<b>(138.3)</b>	<b>30.5</b>	<b>(27.8)</b>	<b>(102.5)</b>	<b>(21.6)</b>	<b>117.9</b>	<b>155.5</b>	<b>62.4</b>	<b>144.3</b>
<b>FIDUCIARY NET POSITION - BEGINNING OF YEAR</b>	<b>\$793.8</b>	<b>\$932.1</b>	<b>\$901.6</b>	<b>\$929.4</b>	<b>\$1,031.9</b>	<b>\$1,053.5</b>	<b>\$935.6</b>	<b>\$780.1</b>	<b>\$717.7</b>	<b>\$573.4</b>
<b>FIDUCIARY NET POSITION - END OF YEAR</b>	<b>\$878.7</b>	<b>\$793.8</b>	<b>\$932.1</b>	<b>\$901.6</b>	<b>\$929.4</b>	<b>\$1,031.9</b>	<b>\$1,053.5</b>	<b>\$935.6</b>	<b>\$780.1</b>	<b>\$717.7</b>
<b>Reserve Fund Balances:</b>										
Health Care Contribution Reserves	\$878.7	\$793.8	\$932.1	\$901.6	\$929.4	\$1,031.9	\$1,053.5	\$935.6	\$780.1	\$717.7
<b>TOTAL FIDUCIARY NET POSITION</b>	<b>\$878.7</b>	<b>\$793.8</b>	<b>\$932.1</b>	<b>\$901.6</b>	<b>\$929.4</b>	<b>\$1,031.9</b>	<b>\$1,053.5</b>	<b>\$935.6</b>	<b>\$780.1</b>	<b>\$717.7</b>

## REVENUES BY SOURCE (DOLLARS IN MILLIONS)

Year	Employer Contributions	Member Contributions and Purchases	Employer Contributions as a Percentage of Covered Payroll	Investment and Securities Lending Income	Health Care Contributions	Other Revenues	Total Revenues
2019	\$514.3	\$303.4	23.2%	\$2,434.3	\$0.5	\$20.5	\$3,273.0
2018	489.9	295.5	22.2%	(487.9)	73.2	24.9	395.6
2017	473.2	282.0	21.7%	1,923.5	74.5	28.6	2,781.8
2016	465.4	268.6	22.6%	1,317.4	73.2	36.3	2,160.9
2015	438.7	245.8	22.1%	(10.0)	71.2	29.2	774.9
2014	427.8	224.0	22.0%	860.7	70.0	25.2	1,607.7
2013	418.2	211.4	21.9%	2,053.0	66.6	28.5	2,777.7
2012	417.0	177.5	22.0%	1,657.9	65.1	30.7	2,348.2
2011	407.5	176.8	21.8%	229.6	62.5	40.5	916.9
2010	414.0	175.5	21.8%	1,651.8	58.9	25.8	2,326.0

## EXPENSES BY TYPE (DOLLARS IN MILLIONS)

Year	Benefit Payments	Refund of Member Contributions	Administrative Expenses	Total Expenses
2019	\$1,457.1	\$13.7	\$21.8	\$1,492.6
2018	1,514.1	18.3	17.0	1,549.4
2017	1,429.2	20.6	20.3	1,470.1
2016	1,396.4	14.2	19.6	1,430.2
2015	1,369.9	13.8	16.3	1,400.0
2014	1,310.5	15.2	16.2	1,341.9
2013	1,302.5	16.0	15.9	1,334.4
2012	1,236.4	26.5	15.4	1,278.3
2011	1,204.2	22.0	15.4	1,241.6
2010	1,132.1	15.8	15.1	1,163.0

## BENEFIT EXPENSES BY TYPE (DOLLARS IN MILLIONS)

Year	Service	Disability	Health Care	Survivor	DROP	Total Benefits
2019	\$789.1	\$257.4	\$76.8	\$92.5	\$241.3	\$1,457.1
2018	749.2	254.3	217.9	89.7	203.0	1,514.1
2017	710.3	252.0	193.6	86.9	186.4	1,429.2
2016	672.6	248.9	223.6	84.6	166.7	1,396.4
2015	631.6	245.7	213.2	82.1	197.3	1,369.9
2014	598.8	242.1	199.6	79.6	190.4	1,310.5
2013	563.2	239.0	191.3	76.8	232.2	1,302.5
2012	529.9	232.8	187.4	74.2	212.1	1,236.4
2011	490.2	225.0	176.3	71.6	241.1	1,204.2
2010	444.4	217.8	159.9	69.0	241.0	1,132.1

## DROP PROGRAM BALANCES (DOLLARS IN MILLIONS)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
<b>Police</b>										
DROP Program Beginning Balance	\$880.2	\$819.3	\$770.6	\$721.9	\$687.8	\$661.0	\$666.5	\$694.7	\$650.8	\$544.9
Accrued Pension and COLA	123.7	117.4	111.3	108.2	103.0	97.6	95.4	90.7	92.3	98.3
Accrued Member Share Contributions	18.1	17.3	16.8	18.7	15.2	12.3	11.9	11.3	11.7	12.5
Accrued Interest	18.8	22.4	18.2	13.8	14.6	15.1	14.2	17.8	32.2	29.2
Withdrawals	(119.2)	(96.2)	(97.6)	(92.0)	(98.7)	(98.2)	(127.0)	(148.0)	(92.3)	(34.1)
<b>DROP PROGRAM ENDING BALANCE - POLICE</b>	<b>921.6</b>	<b>880.2</b>	<b>819.3</b>	<b>770.6</b>	<b>721.9</b>	<b>687.8</b>	<b>661.0</b>	<b>666.5</b>	<b>694.7</b>	<b>650.8</b>
<b>Fire</b>										
DROP Program Beginning Balance	776.3	739.9	692.2	641.0	616.4	584.6	571.4	593.1	536.2	441.4
Accrued Pension and COLA	111.0	108.3	104.1	101.3	101.3	97.8	94.0	88.4	89.3	89.6
Accrued Member Share Contributions	16.4	16.2	15.9	17.2	14.9	12.9	12.0	11.0	11.2	11.2
Accrued Interest	16.5	20.2	16.5	12.2	13.1	13.3	12.4	15.2	27.3	23.8
Withdrawals	(126.8)	(108.3)	(88.8)	(79.5)	(104.7)	(92.2)	(105.2)	(136.3)	(70.9)	(29.8)
<b>DROP PROGRAM ENDING BALANCE - FIRE</b>	<b>793.4</b>	<b>776.3</b>	<b>739.9</b>	<b>692.2</b>	<b>641.0</b>	<b>616.4</b>	<b>584.6</b>	<b>571.4</b>	<b>593.1</b>	<b>536.2</b>
<b>Combined Police and Fire</b>										
DROP Program Beginning Balance	1,656.5	1,559.2	1,462.8	1,362.9	1,304.2	1,245.6	1,237.9	1,287.8	1,187.0	986.3
Accrued Pension and COLA	234.7	225.7	215.4	209.5	204.3	195.4	189.4	179.1	181.6	187.9
Accrued Member Share Contributions	34.5	33.5	32.7	35.9	30.1	25.2	23.9	22.3	22.9	23.7
Accrued Interest	35.3	42.6	34.7	26.0	27.7	28.4	26.6	33.0	59.5	53.0
Withdrawals	(246.0)	(204.5)	(186.4)	(171.5)	(203.4)	(190.4)	(232.2)	(284.3)	(163.2)	(63.9)
<b>DROP PROGRAM ENDING BALANCE - COMBINED</b>	<b>\$1,715.0</b>	<b>\$1,656.5</b>	<b>\$1,559.2</b>	<b>\$1,462.8</b>	<b>\$1,362.9</b>	<b>\$1,304.2</b>	<b>\$1,245.6</b>	<b>\$1,237.9</b>	<b>\$1,287.8</b>	<b>\$1,187.0</b>

## REVENUE CAPACITY INFORMATION

### ACTIVE MEMBER AND TOTAL PAYROLL BASE STATISTICS (DOLLARS IN MILLIONS)

#### 10-YEAR HISTORY OF MEMBERSHIP DATA \*

Year	Total Annual Payroll	Member Contributions	Number of Active Members*	Percentage Change in Payroll	Percentage Change in Member Contributions	Percentage Change in Members
2019	\$2,218.0	\$303.4	29,087	0.4%	2.7%	2.4%
2018	2,209.3	295.5	28,408	1.3%	4.8%	0.8%
2017	2,180.9	282.0	28,175	5.8%	5.0%	2.0%
2016	2,060.9	268.6	27,624	3.7%	9.3%	(0.5)%
2015	1,986.6	245.8	27,769	2.3%	9.7%	0.6%
2014	1,942.3	224.0	27,605	1.5%	6.0%	0.6%
2013	1,913.4	211.4	27,444	0.8%	19.1%	(0.6)%
2012	1,897.4	177.5	27,623	1.5%	0.4%	(2.1)%
2011	1,868.5	176.8	28,222	(1.4)%	0.7%	(1.4)%
2010	1,895.2	175.5	28,619	(0.3)%	4.2%	(1.5)%

\* Includes rehired retirees.

### ACTIVE MEMBERSHIP DATA

#### NUMBER AND ALLOWABLE AVERAGE ANNUAL SALARY AS OF JAN. 1, 2019 \*

Age	Years of Service									TOTAL	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+		
Under 25	1,056	1									<b>1,057</b>
	\$51,867	\$93,709									<b>\$51,907</b>
25-29	2,820	430									<b>3,250</b>
	\$60,082	\$73,674									<b>\$61,881</b>
30-34	2,024	1,654	453	2	1						<b>4,134</b>
	\$61,529	\$76,294	\$83,443	\$99,307	\$41,164						<b>\$69,851</b>
35-39	838	1,102	1,562	512	2						<b>4,016</b>
	\$61,524	\$75,891	\$82,512	\$86,537	\$98,516						<b>\$76,837</b>
40-44	280	419	890	1,759	631	3					<b>3,982</b>
	\$57,973	\$75,535	\$80,875	\$86,115	\$91,050	\$110,421					<b>\$82,652</b>
45-49	114	172	515	1,341	2,483	658	4				<b>5,287</b>
	\$57,045	\$73,778	\$79,143	\$82,632	\$89,632	\$94,858	\$116,039				<b>\$86,287</b>
50-54	39	57	154	503	1,572	1,654	375	1			<b>4,355</b>
	\$58,195	\$68,633	\$74,184	\$81,496	\$87,776	\$91,767	\$99,163	\$73,581			<b>\$88,547</b>
55-59	28	26	56	143	490	832	539	31			<b>2,145</b>
	\$59,292	\$71,717	\$72,200	\$78,021	\$84,715	\$88,638	\$93,677	\$103,571			<b>\$87,499</b>
60-64	4	10	20	47	137	199	135	25	8		<b>585</b>
	\$55,814	\$62,976	\$68,515	\$73,258	\$82,204	\$83,869	\$90,581	\$100,864	\$89,192		<b>\$83,901</b>
Over 64	-	6	4	6	18	31	10	6	12		<b>93</b>
	\$-	\$56,778	\$71,192	\$85,042	\$77,983	\$76,810	\$93,825	\$74,937	\$106,177		<b>\$81,532</b>
<b>TOTAL</b>	<b>7,203</b>	<b>3,877</b>	<b>3,654</b>	<b>4,313</b>	<b>5,334</b>	<b>3,377</b>	<b>1,063</b>	<b>63</b>	<b>20</b>		<b>28,904</b>
	<b>\$59,307</b>	<b>\$75,492</b>	<b>\$81,156</b>	<b>\$84,140</b>	<b>\$88,565</b>	<b>\$91,012</b>	<b>\$95,305</b>	<b>\$99,294</b>	<b>\$99,383</b>		<b>\$78,488</b>

\* Excludes rehired retirees.

## RETIRED MEMBERSHIP BY TYPE OF BENEFITS (SOURCE: ACTUARIAL VALUATION)

AS OF JAN. 1, 2019

Year	Service		Survivors		Disability		Total Beneficiaries
	Police	Fire	Police	Fire	Police	Fire	
2019	8,729	6,759	4,560	3,398	3,634	2,486	29,566
2018	8,558	6,612	4,540	3,414	3,710	2,527	29,361
2017	8,307	6,406	4,484	3,433	3,732	2,551	28,913
2016	8,048	6,207	4,424	3,406	3,754	2,563	28,402
2015	7,842	5,972	4,403	3,386	3,784	2,576	27,963
2014	7,623	5,784	4,395	3,351	3,820	2,588	27,561
2013	7,459	5,683	4,352	3,321	3,834	2,594	27,243
2012	7,204	5,540	4,543	3,389	3,825	2,577	27,078
2011	6,762	5,185	4,479	3,310	3,772	2,566	26,074
2010	6,619	5,108	4,416	3,268	3,762	2,539	25,712

## RETIREES AND BENEFICIARIES STATISTICS (DOLLARS IN MILLIONS)

Year	Benefit Payments*	Refunds	Total Payments*	Number of Benefit Recipients**	Percentage Change in Benefit Recipients	Percentage Change in Total Benefit Payments
2019	\$1,380.3	\$13.7	\$1,394.0	29,792	0.3%	6.0%
2018	1,296.2	18.3	1,314.5	29,707	2.0%	4.6%
2017	1,235.6	20.6	1,256.2	29,113	1.7%	5.8%
2016	1,172.8	14.2	1,187.0	28,638	1.8%	1.4%
2015	1,156.7	13.8	1,170.5	28,143	1.6%	3.9%
2014	1,110.9	15.2	1,126.1	27,703	1.2%	(0.1)%
2013	1,111.2	16.0	1,127.2	27,380	0.7%	4.8%
2012	1,049.0	26.5	1,075.5	27,184	3.7%	2.4%
2011	1,027.9	22.0	1,049.9	26,225	1.4%	6.3%
2010	972.2	15.8	988.0	25,853	1.6%	6.0%

\* Excludes health care benefits.

\*\* Includes Terminated employees entitled to benefits but not yet receiving them.

## AVERAGE MONTHLY BENEFIT PAYMENTS \* FOR MEMBERS PLACED ON RETIREMENT ROLLS

### SERVICE RETIREMENT

Year	Normal	Service Commuted	Age Commuted	Age / Service
2019	\$3,948	\$1,688	\$-	\$3,166
2018	3,859	1,445	-	3,061
2017	3,797	1,268	-	2,569
2016	3,681	1,444	-	2,724
2015	3,651	1,522	-	2,707
2014	3,606	1,698	-	2,455
2013	3,530	1,292	-	2,590
2012	3,466	1,241	-	2,341
2011	3,442	1,282	-	2,699
2010	3,339	1,374	-	3,016

### DISABILITY RETIREMENT \*

Year	Permanent and Total	Permanent and Total Presumptive	Partial	Partial Presumptive	Off Duty
2019	\$4,614	\$4,313	\$3,100	\$5,172	\$2,368
2018	4,618	4,295	3,299	3,465	3,222
2017	4,466	3,998	2,970	2,696	2,809
2016	4,681	4,074	2,882	3,047	2,563
2015	3,864	3,602	2,757	3,239	2,647
2014	3,642	4,252	3,040	3,147	2,258
2013	3,997	5,038	2,865	2,599	2,731
2012	4,276	3,717	2,928	3,338	2,770
2011	3,838	3,870	2,963	2,983	2,510
2010	3,495	3,886	2,827	3,659	2,785

\* Source: Numbers calculated by taking an average of final placements for retirees as listed in OP&F Board of Trustees monthly reports.

## MEMBER HEALTH CARE PREMIUM CONTRIBUTIONS (DOLLARS IN MILLIONS)

Year	Premium Contributions*	Percentage Change in Premium Contributions Received	Number of Covered Lives **	Health Care Benefit Payments	Percentage of Benefit Payments Covered by Premium Contributions	Net Benefit Payment Per Covered Life
2019	\$0.5	(99)%	24,969	\$76.8	1%	\$0.003
2018	73.2	(2)%	26,320	217.9	34%	0.005
2017	74.5	2%	26,587	193.6	38%	0.004
2016	73.2	3%	26,319	223.6	33%	0.006
2015	71.2	2%	26,822	213.2	33%	0.005
2014	70.0	5%	26,794	199.6	35%	0.005
2013	66.6	2%	26,723	191.3	35%	0.005
2012	65.1	4%	26,044	187.4	35%	0.005
2011	62.5	6%	25,396	176.3	35%	0.004
2010	58.9	-%	25,308	159.9	37%	0.004

\* In 2019, OP&F went to a stipend model health care plan from a self-funded plan.

\*\* In 2012 OP&F restated the number of covered lives column using actuarially certified number of covered lives.

## STATE OF OHIO SUBSIDY PAYMENTS

Year	Subsidy Amount	Percentage Change
2019	\$260,488	(13)%
2018	300,811	(13)%
2017	346,475	(13)%
2016	398,161	(11)%
2015	446,735	(11)%
2014	500,152	(6)%
2013	530,573	(9)%
2012	580,657	(9)%
2011	639,099	(8)%
2010	692,634	(11)%

## OP&F'S COST-OF-LIVING ALLOWANCE (COLA) HISTORY

COLA Payment Dates	Members who are 55 years old with less than 15 years of service credit as of July 1, 2013 and have been receiving Benefits for at least one year COLA Paid	Members who are 55 years old with 15 or more years of service credit as of July 1, 2013 and have been receiving Benefits for at least one year COLA Paid	EDOR* July 1, 2000 to June 30, 2012 COLA Paid	EDOR* July 1, 1999 to June 30, 2000 COLA Paid	EDOR* July 1, 1998 to June 30, 1999 COLA Paid	EDOR* July 1, 1997 to June 30, 1998 COLA Paid
Nov. 1, 2019 thru Oct. 31, 2020	1.50%	3.00%	3.00%	3.00%	3.00%	3.00%
Nov. 1, 2018 thru Oct. 31, 2019	2.30%	3.00%	3.00%	3.00%	3.00%	3.00%
Nov. 1, 2017 thru Oct. 31, 2018	2.30%	3.00%	3.00%	3.00%	3.00%	3.00%
Nov. 1, 2016 thru Oct. 31, 2017	1.20%	3.00%	3.00%	3.00%	3.00%	3.00%
Nov. 1, 2015 thru Oct. 31, 2016	-%	3.00%	3.00%	3.00%	3.00%	3.00%
Nov. 1, 2014 thru Oct. 31, 2015	1.70%	3.00%	3.00%	3.00%	3.00%	3.00%
Nov. 1, 2013 thru Oct. 31, 2014	1.20%	3.00%	3.00%	3.00%	3.00%	3.00%
July 1, 2013 thru Oct. 31, 2013	2.00%	3.00%	3.00%	3.00%	3.00%	3.00%
July 1, 2012 thru June 30, 2013			3.00%	3.00%	3.00%	3.00%
July 1, 2011 thru June 30, 2012			3.00%	3.00%	3.00%	3.00%
July 1, 2010 thru June 30, 2011			3.00%	3.00%	3.00%	3.00%
July 1, 2009 thru June 30, 2010			3.00%	3.00%	3.00%	3.00%
July 1, 2008 thru June 30, 2009			3.00%	3.00%	3.00%	3.00%
July 1, 2007 thru June 30, 2008			3.00%	3.00%	3.00%	3.00%
July 1, 2006 thru June 30, 2007			3.00%	3.00%	3.00%	3.00%
July 1, 2005 thru June 30, 2006			3.00%	3.00%	3.00%	3.00%
July 1, 2004 thru June 30, 2005			3.00%	3.00%	3.00%	3.00%
July 1, 2003 thru June 30, 2004			3.00%	3.00%	3.00%	3.00%
July 1, 2002 thru June 30, 2003			3.00%	3.00%	3.00%	3.00%
July 1, 2001 thru June 30, 2002			3.00%	3.00%	3.00%	3.00%
July 1, 2000 thru June 30, 2001				2.20%	2.20%	2.20%
July 1, 1999 thru June 30, 2000					1.30%	1.30%
July 1, 1998 thru June 30, 1999						2.30%
July 1, 1997 thru June 30, 1998						
July 1, 1996 thru June 30, 1997						
July 1, 1995 thru June 30, 1996						
July 1, 1994 thru June 30, 1995						
July 1, 1993 thru June 30, 1994						
July 1, 1992 thru June 30, 1993						
July 1, 1991 thru June 30, 1992						
July 1, 1990 thru June 30, 1991						
July 1, 1989 thru June 30, 1990						
July 1, 1988 thru June 30, 1989						

\* EDOR = Effective Date of Retirement

Additional Notes:

(1) First COLAs were paid July 1, 1988 through June 30, 1989.  
 (2) July 1, 2002 COLAs were a flat 3% (regardless of the CPI).

(3) Beginning July 1, 2013:

(A) Retired members who are at least 55 years old and have been receiving benefits for at least one year may be eligible for a cost-of-living allowance adjustment.

(B) The age 55 provision for receiving a COLA does not apply to those who are receiving a permanent and total disability benefit, statutory survivors and annuity beneficiaries.



## EMPLOYER CONTRIBUTION RATES (1967 - PRESENT)\*

Time Frame of Rates	Employer Rates	
	Police	Fire
Jan. 1, 1986 thru Present	19.50%	24.00%
Jan. 1, 1985 thru Dec. 31, 1985	20.03%	24.59%
Jan. 1, 1984 thru Dec. 31, 1984	21.35%	24.59%
Jan. 1, 1983 thru Dec. 31, 1983	18.45%	23.57%
Jan. 1, 1982 thru Dec. 31, 1982	16.62%	22.39%
Jan. 1, 1981 thru Dec. 31, 1981	15.60%	20.72%
Jan. 1, 1980 thru Dec. 31, 1980	15.70%	19.87%
Jan. 1, 1979 thru Dec. 31, 1979	18.40%	20.11%
Jan. 1, 1978 thru Dec. 31, 1978	17.53%	18.90%
Jan. 1, 1977 thru Dec. 31, 1977	15.34%	16.77%
Jan. 1, 1976 thru Dec. 31, 1976	14.02%	15.57%
Jan. 1, 1975 thru Dec. 31, 1975	12.49%	13.78%
Jan. 1, 1974 thru Dec. 31, 1974	12.88%	13.60%
Jan. 1, 1973 thru Dec. 31, 1973	12.85%	13.41%
Jan. 1, 1972 thru Dec. 31, 1972	12.96%	13.26%
Jan. 1, 1971 thru Dec. 31, 1971	12.81%	12.96%
Jan. 1, 1970 thru Dec. 31, 1970	15.52%	15.52%
Jan. 1, 1969 thru Dec. 31, 1969	14.68%	14.49%
Jan. 1, 1968 thru Dec. 31, 1968	13.66%	13.50%
Jan. 1, 1967 thru Dec. 31, 1967	13.55%	13.13%

\* For employer billing purposes, the September 1988 billing was carried through Sept. 30, 1988 and was not cut off at Sept. 8, 1988. The same goes for the employee rates for the most part.

## MEMBER CONTRIBUTION RATES

Time Frame of Rates	Member Rates	
	Police	Fire
July 2, 2015 thru Present	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%
Aug. 1, 1986 thru Sept. 8, 1988	9.50%	9.50%
March 1, 1980 thru July 31, 1986	8.50%	8.50%
Jan. 1, 1968 thru Feb. 28, 1980	7.00%	7.00%
Jan. 1, 1967 thru Dec. 31, 1967	6.00%	6.00%

## HEALTH CARE ALLOCATION RATES FROM EMPLOYER CONTRIBUTIONS

Time Frame of Rates	Percentage
Jan. 1, 2014 thru Present	0.50%
June 1, 2013 thru Dec. 31, 2013	2.85%
Jan. 1, 2013 thru May 31, 2013	4.69%
Jan. 1, 2007 thru Dec. 31, 2012	6.75%
Jan. 1, 2002 thru Dec. 31, 2006	7.75%
Jan. 1, 2001 thru Dec. 31, 2001	7.50%
Jan. 1, 2000 thru Dec. 31, 2000	7.25%
Jan. 1, 1999 thru Dec. 31, 1999	7.00%
Jan. 1, 1992 thru Dec. 31, 1998	6.50%
Jan. 1, 1974 thru Dec. 31, 1991	Rate equal to dollar of Benefits Paid

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**ACTUARIAL INTEREST RATES**

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Time Frame of Rates	Actuarial Interest Rates	
	Police	Fire
Jan. 1, 2017 thru Present	8.000%	8.000%
Jan. 1, 1989 thru Dec. 31, 2016	8.250%	8.250%
Jan. 1, 1986 thru Dec. 31, 1988	7.750%	7.750%
Jan. 1, 1983 thru Dec. 31, 1985	7.500%	7.500%
Jan. 1, 1980 thru Dec. 31, 1982	6.375%	6.375%
Jan. 1, 1979 thru Dec. 31, 1979	6.000%	6.000%
Jan. 1, 1974 thru Dec. 31, 1978	5.000%	5.000%
Jan. 1, 1972 thru Dec. 31, 1973	4.750%	4.750%
Jan. 1, 1970 thru Dec. 31, 1971	4.625%	4.625%
Jan. 1, 1967 thru Dec. 31, 1969	4.250%	4.250%

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## DROP AND RE-EMPLOYED INTEREST RATES

Time Frame of Rates *	Member Rates	
	DROP	Re-Employed
April 1, 2020 thru June 30, 2020	2.50%	0.70%
Jan. 1, 2020 thru March 31, 2020	2.50%	1.92%
Oct. 1, 2019 thru Dec. 31, 2019	1.68%	1.68%
July 1, 2019 thru Sept. 30, 2019	2.00%	2.00%
April 1, 2019 thru June 30, 2019	2.41%	2.41%
Jan. 1, 2019 thru March 31, 2019	2.69%	2.69%
Oct. 1, 2018 thru Dec. 31, 2018	3.05%	3.05%
July 1, 2018 thru Sept. 30, 2018	2.85%	2.85%
April 1, 2018 thru June 30, 2018	2.74%	2.74%
Jan. 1, 2018 thru March 31, 2018	2.40%	2.40%
Oct. 1, 2017 thru Dec. 31, 2017	2.33%	2.33%
July 1, 2017 thru Sept. 30, 2017	2.31%	2.31%
April 1, 2017 thru June 30, 2017	2.40%	2.40%
Jan. 1, 2017 thru March 31, 2017	2.45%	2.45%
Oct. 1, 2016 thru Dec. 31, 2016	1.60%	1.60%
July 1, 2016 thru Sept. 30, 2016	1.49%	1.49%
April 1, 2016 thru June 30, 2016	1.78%	1.78%
Jan. 1, 2016 thru March 31, 2016	2.27%	2.27%
Oct. 1, 2015 thru Dec. 31, 2015	2.06%	2.06%
July 1, 2015 thru Sept. 30, 2015	2.35%	2.35%
April 1, 2015 thru June 30, 2015	1.94%	1.94%
Jan. 1, 2015 thru March 31, 2015	2.17%	2.17%
Oct. 1, 2014 thru Dec. 31, 2014	2.52%	2.52%
July 1, 2014 thru Sept. 30, 2014	2.53%	2.53%
April 1, 2014 thru June 30, 2014	2.73%	2.73%
Jan. 1, 2014 thru March 31, 2014	3.04%	3.04%
Oct. 1, 2013 thru Dec. 31, 2013	2.64%	2.64%
July 1, 2013 thru Sept. 30, 2013	2.52%	2.52%
April 1, 2013 thru June 30, 2013	1.87%	1.87%
Jan. 1, 2013 thru March 31, 2013	1.78%	1.78%
Oct. 1, 2012 thru Dec. 31, 2012	1.65%	1.65%
July 1, 2012 thru Sept. 30, 2012	1.67%	1.67%
April 2, 2012 thru June 30, 2012	2.23%	2.23%
Jan. 19, 2003 thru April 1, 2012	5.00%	5.00%

\* Effective April 2, 2012 the interest rate is equal to the 10-year U.S. Treasury Note Business Day Series, as published by the United States Department of the Treasury, with a cap of 5%. Effective Jan. 1, 2020 the Board of Trustees approved a floor for the DROP interest rate equal to 2.5%.

## DROP MEMBER COUNT ROLL FORWARD (AS OF DEC. 31)

POLICE		2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Balance Beginning of Year		2,245	2,158	2,050	2,001	1,918	1,883	1,795	1,801	1,985	1,990
Number of members that entered into DROP	Increases	435	388	415	369	364	322	384	329	356	289
Number of members that terminated DROP	Decreases	(349)	(301)	(307)	(320)	(281)	(287)	(296)	(335)	(540)	(294)
<b>SUB-TOTAL AT YEAR END - POLICE</b>		<b>2,331</b>	<b>2,245</b>	<b>2,158</b>	<b>2,050</b>	<b>2,001</b>	<b>1,918</b>	<b>1,883</b>	<b>1,795</b>	<b>1,801</b>	<b>1,985</b>
FIRE		2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Balance Beginning of Year		2,028	1,996	1,902	1,887	1,907	1,862	1,741	1,740	1,888	1,744
Number of members that entered into DROP	Increases	307	328	369	301	290	346	369	283	315	349
Number of members that terminated DROP	Decreases	(309)	(296)	(275)	(286)	(310)	(301)	(248)	(282)	(463)	(205)
<b>SUB-TOTAL AT YEAR END - FIRE</b>		<b>2,026</b>	<b>2,028</b>	<b>1,996</b>	<b>1,902</b>	<b>1,887</b>	<b>1,907</b>	<b>1,862</b>	<b>1,741</b>	<b>1,740</b>	<b>1,888</b>
COMBINED POLICE AND FIRE		2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Balance Beginning of Year		4,273	4,154	3,952	3,888	3,825	3,745	3,536	3,541	3,873	3,734
Number of members that entered into DROP	Increases	742	716	784	670	654	668	753	612	671	638
Number of members that terminated DROP	Decreases	(658)	(597)	(582)	(606)	(591)	(588)	(544)	(617)	(1,003)	(499)
<b>TOTAL AT YEAR END - COMBINED</b>		<b>4,357</b>	<b>4,273</b>	<b>4,154</b>	<b>3,952</b>	<b>3,888</b>	<b>3,825</b>	<b>3,745</b>	<b>3,536</b>	<b>3,541</b>	<b>3,873</b>

ACTUARIAL VALUATION INFORMATION - PENSION TRUST FUND  
(DOLLARS IN MILLIONS) \*

As of Jan. 1	Valuation Assets *	Actuarial Accrued Liabilities (AAL) *	Unfunded Actuarial Accrued Liabilities (UAAL)	Ratio of Assets to AAL	Active Member Payroll	UAAL as a Percentage of Active Member Payroll
2019	\$14,753.2	\$21,264.7	\$6,511.5	69.4%	\$2,218.0	293.6%
2018	14,594.6	20,887.2	6,292.6	69.9%	2,209.3	284.8%
2017	14,162.5	20,290.4	6,127.9	69.8%	2,180.9	281.0%
2016	13,653.0	19,135.9	5,482.9	71.3%	2,060.9	266.1%
2015	13,029.3	18,395.6	5,366.3	70.8%	1,986.6	270.1%
2014	11,063.2	16,577.8	5,514.6	66.7%	1,942.3	283.9%
2013	10,278.0	16,007.9	5,729.9	64.2%	1,913.4	299.5%
2012	10,309.0	16,346.7	6,037.7	63.1%	1,897.4	318.2%
2011	10,681.0	15,384.4	4,703.4	69.4%	1,868.5	251.7%
2010	10,794.1	14,830.7	4,036.6	72.8%	1,895.2	213.0%

\* The amounts reported in this schedule do not include assets or liabilities for post-employment health care benefits.

## HISTORICAL ANNUAL INVESTMENT RESULTS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
<b>Domestic Equity</b>										
OP&F	31.77%	(3.30)%	22.41%	15.60%	0.53%	11.27%	35.53%	15.88%	0.94%	22.43%
<b>International Equity *</b>										
OP&F	23.35%	(17.32)%	29.12%	2.75%	(0.77)%	(5.56)%	21.01%	19.96%	(12.37)%	15.11%
<b>Private Markets **</b>										
OP&F	13.65%	15.65%	21.80%	14.37%	12.06%	18.34%	11.50%	9.58%	17.66%	12.57%
<b>High Yield</b>										
OP&F - High Yield*	13.49%	(0.48)%	7.05%	12.80%	(0.95)%	2.81%	6.15%	15.64%	6.00%	15.02%
<b>Private Credit **</b>										
OP&F	11.62%	7.51%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Treasury Inflation Protected Securities (TIPS)</b>										
OP&F - TIPS	15.70%	(0.26)%	2.89%	18.76%	0.26%	19.43%	(10.62)%	14.93%	35.50%	15.28%
<b>Real Estate **</b>										
OP&F	8.76%	13.69	10.30%	13.14%	16.83%	18.57%	15.11%	13.06%	18.01%	4.86%
<b>Real Assets **</b>										
OP&F	7.08%	11.81%	4.65%	2.99%	1.03%	8.99%	3.37%	N/A	N/A	N/A
<b>Midstream Energy Infrastructure</b>										
OP&F	13.46%	(13.06)%	(4.08)%	20.42%	(29.31)%	16.91%	32.25%	N/A	N/A	N/A
<b>Fixed Income</b>										
OP&F - Core	8.13%	1.24%	4.26%	4.14%	1.45%	4.07%	(1.05)%	6.31%	6.41%	9.72%
OP&F - Commercial Mortgages**	6.73%	5.29%	2.87%	5.63%	3.21%	8.56%	6.72%	5.28%	4.99%	16.63%
<b>Total Portfolio</b>										
OP&F	17.89%	(1.78)%	14.30%	11.51%	0.65%	6.79%	16.94%	15.41%	2.57%	15.85%
<b>Policy Index ***</b>										
OP&F	16.32%	(2.67)%	12.41%	11.45%	(2.18)%	6.87%	14.61%	14.94%	2.43%	12.61%

\* a) International Equity benchmark is a blend of the MSCI ACWI ex U.S. (Net) through June 30, 2011, the MSCI ACWI ex U.S. Iran/Sudan Free (I/S Free) from July 1, 2011 through Sept. 30, 2012 and the MSCI ACWI ex U.S. Iran/Sudan Free IMI Index from Oct. 1, 2012 forward. b) High Yield benchmark is a blend of the CS First Boston Dev. Countries HY through Aug. 31, 2016, the CS First Boston High Yield from Sept. 1, 2016 through Nov. 30, 2016, and the Merrill Lynch U.S. High Yield Constrained Index from Dec. 1, 2016 forward. c) Midstream Energy Infrastructure benchmark is a blend of the Alerian MLP Index from July 1, 2013 thru June 30, 2019, and the Alerian Midstream Energy Index from July 1, 2019 forward.

\*\* One quarter in arrears.

\*\*\* Interim Policy Index: 18% Wilshire 5000, 18% MSCI ACWI ex-U.S. Iran/Sudan Free IMI Index, 11% Bloomberg Barclays Aggregate, 9% Merrill Lynch U.S. High Yield Constrained Index, 3.5% S&P LSTA Levered Loan Index + 2% Lagged, 8.5% Bloomberg Barclays U.S. Gov't Inflation Linked Bond Index X2 (-) Libor, 12% NCREIF ODCE Index (Net) Lagged, 7.5% Wilshire 5000 + 3% Lagged, 4.5% CPI + 5% (Net) Lagged, 8% Alerian Midstream Energy Index.

Long-Term Policy: 16% Wilshire 5000, 16% MSCI ACWI ex-U.S. Iran/Sudan Free IMI Index, 23% Bloomberg Barclays Aggregate, 7% Merrill Lynch U.S. High Yield Constrained Index, 5% S&P LSTA Levered Loan Index + 2%, 17% Bloomberg Barclays U.S. Gov't Inflation Linked Bond Index X2 (-) Libor, 12% NCREIF ODCE Index (Net) Lagged, 8% Wilshire 5000 + 3% Lagged, 8% CPI + 5% (Net) Lagged, 8% Alerian Midstream Energy Index. (adds to 120% as "Risk Parity" approach uses 2x levered U.S. Gov't Inflation-Protected Securities and 2x levered Core Fixed Income).

Time Weighted methodology, based upon fair values, is used when calculating performance.

## DEBT CAPACITY INFORMATION

OP&F does not have any outstanding debt, nor are there any plans to ever pursue issuing debt anytime in the future.

## DEMOGRAPHIC AND ECONOMIC INFORMATION

### NUMBER OF EMPLOYER UNITS \*

Year	Municipalities		Townships		Villages		Total		Total
	Police	Fire	Police	Fire	Police	Fire	Police	Fire	Combined
2019	248	201	-	170	278	37	526	408	934
2018	248	197	-	161	280	40	528	398	926
2017	248	199	-	162	282	35	530	396	926
2016	248	221	-	130	279	37	527	388	915
2015	249	220	-	131	280	37	529	388	917
2014	249	221	-	129	283	36	532	386	918
2013	249	223	-	124	282	33	531	380	911
2012	249	225	-	122	288	33	537	380	917
2011	250	227	-	123	283	34	533	384	917
2010	252	229	-	123	284	33	536	385	921

\* Beginning in 2017 OP&F reclassified Fire Districts under Townships.

## RETIRED MEMBERSHIP BY TYPE OF BENEFITS AND AVERAGE ANNUAL ALLOWANCE (SOURCE: ACTUARIAL VALUATION) AS OF JAN. 1, 2019

Age Last Birthday	Number	Annual Allowance	Average Annual Allowance
<b>Service Retirees</b>			
Under 60	2,806	\$137,910,627	\$49,148
60 - 64	3,149	170,973,333	54,294
65 - 69	3,103	164,343,800	52,963
70 - 74	2,688	137,720,040	51,235
75 - 79	1,877	85,716,754	45,667
Over 79	1,865	66,940,971	35,893
<b>TOTAL</b>	<b>15,488</b>	<b>\$763,605,525</b>	<b>\$49,303</b>
<b>Survivors and Beneficiaries</b>			
Under 60	1,188	\$12,073,548	\$10,163
60 - 64	575	7,758,012	13,492
65 - 69	876	11,367,618	12,977
70 - 74	1,065	12,850,497	12,066
75 - 79	1,239	13,926,522	11,240
Over 79	3,015	31,333,506	10,393
<b>TOTAL</b>	<b>7,958</b>	<b>\$89,309,703</b>	<b>\$11,223</b>
<b>Disability Retirees</b>			
Under 60	2,065	\$83,847,850	\$40,604
60 - 64	967	43,607,619	45,096
65 - 69	1,061	46,967,913	44,268
70 - 74	967	40,723,421	42,113
75 - 79	617	23,829,284	38,621
Over 79	443	13,970,456	31,536
<b>TOTAL</b>	<b>6,120</b>	<b>\$252,946,543</b>	<b>\$41,331</b>

## SCHEDULE OF AVERAGE BENEFITS\*

This schedule displays the number of new retirees each year, grouped by years of credited service. Prior year numbers are not adjusted as members roll off the rolls. Retirement benefits are calculated based on the Final Average Salary (FAS) of the member. For members with 15 years or more of service credit as of July 1, 2013, FAS represents the member's three highest years

of allowable earnings. For members with less than 15 years of service credit as of July 1, 2013, FAS represents the member's five highest years of allowable earnings.

The Total New Retirees column represents the average monthly benefit and average FAS for the retiree counts listed in each year.

RETIREMENT EFFECTIVE DATES	YEARS CREDITED SERVICE							TOTAL NEW RETIREES	
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+		
2019	Average Monthly Benefit	\$1,013	\$3,467	\$3,351	\$2,479	\$3,486	\$4,170	\$5,211	\$4,112
	Average Final Average Salary	\$51,667	\$70,342	\$69,191	\$71,050	\$77,710	\$79,431	\$81,773	\$79,011
	Number of Active Recipients	1	3	11	26	55	777	41	914
2018	Average Monthly Benefit	\$-	\$3,001	\$3,753	\$2,691	\$3,352	\$4,240	\$5,419	\$4,153
	Average Final Average Salary	\$-	\$60,515	\$78,920	\$73,634	\$76,564	\$79,029	\$84,710	\$78,769
	Number of Active Recipients	-	4	12	35	49	720	29	849
2017	Average Monthly Benefit	\$-	\$1,892	\$2,792	\$2,781	\$3,119	\$4,139	\$4,707	\$4,019
	Average Final Average Salary	\$-	\$46,107	\$68,897	\$69,634	\$70,690	\$77,000	\$74,777	\$76,051
	Number of Active Recipients	-	2	11	39	49	731	33	865
2016	Average Monthly Benefit	\$1,395	\$2,314	\$2,638	\$2,477	\$3,234	\$4,075	\$4,277	\$3,925
	Average Final Average Salary	\$34,158	\$59,041	\$59,716	\$63,590	\$73,762	\$75,132	\$69,681	\$73,889
	Number of Active Recipients	1	6	14	44	40	737	31	873
2015	Average Monthly Benefit	\$-	\$1,332	\$2,387	\$2,445	\$3,175	\$4,127	\$4,944	\$3,976
	Average Final Average Salary	\$-	\$49,515	\$59,939	\$64,106	\$71,568	\$75,267	\$77,280	\$74,128
	Number of Active Recipients	-	5	17	48	43	728	40	881
2014	Average Monthly Benefit	\$-	\$2,243	\$2,577	\$2,349	\$3,096	\$4,011	\$4,738	\$3,910
	Average Final Average Salary	\$-	\$62,465	\$58,188	\$62,903	\$72,772	\$72,161	\$76,831	\$71,822
	Number of Active Recipients	-	8	9	29	38	708	36	828
2013	Average Monthly Benefit	\$2,612	\$2,487	\$2,736	\$2,216	\$3,251	\$3,994	\$4,832	\$3,830
	Average Final Average Salary	\$52,748	\$69,490	\$61,462	\$61,232	\$71,553	\$71,014	\$74,792	\$70,293
	Number of Active Recipients	2	5	25	43	47	638	29	789
2012	Average Monthly Benefit	\$879	\$2,247	\$2,876	\$2,783	\$2,968	\$3,932	\$4,398	\$3,761
	Average Final Average Salary	\$42,089	\$55,994	\$65,733	\$63,252	\$68,219	\$68,661	\$68,067	\$67,858
	Number of Active Recipients	1	14	27	69	56	662	73	902
2011	Average Monthly Benefit	\$2,042	\$2,698	\$2,758	\$2,582	\$3,124	\$3,906	\$4,722	\$3,895
	Average Final Average Salary	\$52,736	\$56,748	\$64,823	\$61,478	\$68,588	\$66,645	\$69,404	\$66,659
	Number of Active Recipients	2	23	42	61	37	907	215	1,287
2010	Average Monthly Benefit	\$1,989	\$2,307	\$2,923	\$2,858	\$2,907	\$3,653	\$4,415	\$3,602
	Average Final Average Salary	\$52,986	\$63,760	\$63,148	\$64,760	\$64,611	\$64,545	\$67,106	\$64,829
	Number of Active Recipients	4	18	41	39	51	452	122	727

\* All years begin Jan. 1 and end Dec. 31.

## PRINCIPAL PARTICIPATING EMPLOYERS AS OF DEC. 31, 2019

Employer Name	Covered Employees	Rank	Percentage of Total Covered Members
City of Columbus	3,835	1	13.2%
City of Cleveland	2,531	2	8.7%
City of Cincinnati	1,949	3	6.7%
City of Toledo	1,251	4	4.3%
City of Akron	862	5	3.0%
City of Dayton	672	6	2.3%
City of Canton	342	7	1.2%
City of Youngstown	280	8	1.0%
City of Springfield	271	9	0.9%
City of Hamilton	244	10	0.8%
All Others	16,850		57.9%
<b>TOTAL</b>	<b>29,087</b>		<b>100.0%</b>

## PRINCIPAL PARTICIPATING EMPLOYERS AS OF DEC. 31, 2010

Employer Name	Covered Employees	Rank	Percentage of Total Covered Members
City of Columbus	3,562	1	12.5%
City of Cleveland	2,542	2	8.9%
City of Cincinnati	1,952	3	6.8%
City of Toledo	1,130	4	3.9%
City of Akron	818	5	2.9%
City of Dayton	725	6	2.5%
City of Canton	333	7	1.2%
City of Youngstown	310	8	1.1%
City of Springfield	270	9	0.9%
City of Hamilton	227	10	0.8%
All Others	16,750		58.5%
<b>TOTAL</b>	<b>28,619</b>		<b>100.0%</b>

## OPERATING INFORMATION

### OP&F EMPLOYEE BUDGETED POSITION COUNTS

Department*	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Administration	19	19	20	19	36	48	47	45	46	46
Finance	25	24	21	21	21	21	22	22	13	13
Business and Technology Solutions	41	41	45	44	26	25	24	24	24	24
Investments	17	16	16	15	14	14	14	15	15	15
Member Services	46	46	46	46	46	34	34	38	46	46
<b>TOTAL FULL-TIME POSITIONS</b>	<b>148</b>	<b>146</b>	<b>148</b>	<b>145</b>	<b>143</b>	<b>142</b>	<b>141</b>	<b>144</b>	<b>144</b>	<b>144</b>

\* In 2018, Purchasing was transitioned to Finance from BTS. In 2015, Customer Service was transitioned to Member Services and Purchasing was transitioned to BTS from Administration. In 2012, Employer Services was transitioned to Finance from Member Services.

### PERSONNEL SALARIES BY YEAR (DOLLARS IN THOUSANDS)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Salaries and Wages	\$11,227.3	\$10,801.4	\$10,317.3	\$9,971.3	\$9,635.1	\$9,054.2	\$9,248.5	\$8,756.9	\$8,807.9	\$8,313.9
Average Salary per Budgeted Staff	\$75.9	\$74.0	\$69.7	\$68.8	\$67.4	\$63.8	\$65.6	\$60.8	\$61.2	\$57.7

### OP&F BUDGET (DOLLARS IN MILLIONS)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Administrative Expenses (Actual) *	\$75.9	\$67.3	\$70.3	\$63.6	\$59.4	\$61.6	\$59.4	\$52.8	\$50.3	\$46.5
Administrative Expenses (Budget) *	\$77.3	\$72.5	\$70.2	\$66.0	\$65.4	\$62.6	\$62.6	\$58.7	\$54.5	\$45.6
Percentage of Budget vs Actual	98%	93%	100%	96%	91%	98%	95%	90%	92%	102%
Capital (Actual)	\$1.1	\$0.5	\$0.4	\$0.5	\$1.3	\$2.1	\$3.1	\$2.9	\$1.7	\$2.0
Capital (Budget)	\$3.1	\$2.9	\$4.3	\$4.6	\$3.0	\$2.8	\$3.4	\$3.4	\$3.7	\$4.4
Percentage of Budget vs Actual	35%	17%	9%	11%	43%	75%	91%	85%	46%	45%
Operating Expenses (Actual) *	\$20.5	\$15.8	\$18.9	\$17.9	\$14.6	\$14.4	\$14.3	\$13.6	\$13.6	\$13.1
Investment Expenses (Actual) *	\$55.4	\$51.5	\$51.4	\$45.7	\$44.8	\$47.2	\$45.1	\$39.2	\$36.7	\$33.4

\* Excludes depreciation expense.

## OTHER OPERATING STATISTICS

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Staff	148	146	148	145	143	142	141	144	144	144
Investment Staff	17	16	16	15	14	14	14	15	15	15
Investment										
Actual Expenses	\$55.4	\$51.5	\$51.4	\$45.7	\$44.8	\$47.2	\$45.1	\$39.2	\$36.7	\$33.4
Investment Income	\$2,434.3	\$(487.9)	\$1,923.5	\$1,317.4	\$(10.0)	\$860.7	\$2,053.0	\$1,657.9	\$229.6	\$1,651.8
Investment Staff to										
Investment Expense Ratio	\$3.3	\$3.2	\$3.2	\$3.0	\$3.2	\$3.4	\$3.2	\$2.6	\$2.4	\$2.2
Total Staff to Investment										
Income Ratio	\$16.4	\$(3.3)	\$13.0	\$9.1	\$(0.1)	\$6.1	\$14.6	\$11.5	\$1.6	\$11.5
Investment Staff to										
Investment Income Ratio	\$143.2	\$(30.5)	\$120.2	\$87.8	\$(0.7)	\$61.5	\$146.6	\$110.5	\$15.3	\$110.1

## DEATH BENEFIT FUND

Pursuant to Section 742.63 of the Ohio Revised Code, OP&F administers the Ohio Public Safety Officers Death Benefit Fund, which 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. Effective Jan. 1, 2019, Ohio Substitute Senate Bill 296 of the 132nd General Assembly was enacted to permanently expand benefits paid to DBF recipients. If the public safety officer had not qualified for age and service retirement these eligible survivors are entitled to receive the member's full base pay until the officer would have been eligible to retire as of the maximum age and service pension for the officer's position. If, and at the time that a public safety officer would have qualified for the maximum age and service retirement, the survivors are eligible for a transitional benefit equal to 75% of the monthly base pay. The transitional benefit is paid in addition to any survivor benefits and optional payment that may have been selected.

Funds are disbursed to OP&F, on a quarterly basis, each State fiscal year (July 1-June 30) and benefits are paid monthly by OP&F to eligible recipients. The unused balance at June 30 is returned to the State. The assets and liabilities of the DBF are included in the Fund's combining statement of plan net assets as of Dec. 31, 2019 as an agency fund. The following is a schedule of DBF financial activity:

<b>Balance Jan. 1, 2019</b>	<b>\$211,025</b>
Less: Survivor Benefits Paid Jan. 1 thru June 30, 2019	(14,623,820)
Balance returned to State of Ohio	(1,087,205)
State Funding Received	32,700,000
Less: Survivor Benefits Paid July 1 thru Dec. 31, 2019	(16,021,093)
<b>BALANCE DEC. 31, 2019</b>	<b>\$ 1,178,907</b>

## LIST OF PROFESSIONAL ACRONYMS AND SYMBOLS

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AAL = Actuarial Accrued Liabilities	HY = High Yield
ACH = Automated Clearing House	IMI = Investable Market Index
ACWI Ex-U.S. = All Country World Index Excluding the U.S.	IRC = Internal Revenue Code
bps = Basis Points	IRR = Internal Rate of Return
CAFR = Comprehensive Annual Financial Report	IRS = Internal Revenue Service
CARES Act = Coronavirus Aid, Relief, and Economic Security (CARES) Act	I/S Free = Iran and Sudan Free
COLA = Cost-of-Living Allowance	JSA = Joint and Survivor Annuity
Connector = OPERS Medicare Connector	LACC = Life Annuity Certain and Continuous
CPI = Consumer Price Index	LIBOR = London Interbank Offered Rate
DB = Defined Benefits	M&A = Mergers and Acquisitions
DBF = Death Benefit Fund	MD&A = Management Discussion and Analysis
DROP = Deferred Retirement Option Plan	MLPs = Master Limited Partnerships
EDOR = Effective Date of Retirement	MSCI = Morgan Stanley Capital International
EMSI = Economic Modeling Specialist International	NAV = Net Asset Value
€ = Euro	NCREIF = National Council of Real Estate Investment Fiduciaries
FAS = Final Average Salary	NPL = Net Pension Liability
FED = Federal Reserve	NR = Not Rated
FHLMC = Federal Home Loan Mortgage Corporation	ODCE = Open End Diversified Core Equity
FNMA = Federal National Mortgage Association	OP&F = Ohio Police & Fire Pension Fund
FOMC = Federal Open Market Committee	OPEB = Other Post-Employment Benefit
GASB = Government Accounting Standards Board	OPERS = Ohio Public Employees Retirement System
GDP = Gross Domestic Product	ORC = Ohio Revised Code
GFOA = Government Finance Officers Association of the U.S. and Canada	ORSC = Ohio Retirement Study Council
GNMA = Government National Mortgage Association	PIMCO = Pacific Investment Management Company
HCSF = Health Care Stabilization Fund	PME = Public Market Equivalent
HRA = Health Reimbursement Arrangement	PPCC = Public Pension Coordination Council
	REITs = Real Estate Investment Trusts

## **LIST OF PROFESSIONAL ACRONYMS AND SYMBOLS - CONTINUED**

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REMICs = Real Estate Mortgage Investment Conduits

RFP = Request for Proposal

RMA = Retiree Medical Account

RSI = Required Supplementary Information

S&P = Standard and Poor's

SB = Senate Bill

STIF = Short Term Investment Fund

STRIPS = Separate Trading of Registered Interest and Principal of Securities

TIPS = Treasury Inflation Protected Securities

TTY = TeletypeWriter

UAAL = Unfunded Actuarial Accrued Liabilities

U.S. = United States of America

U.S.D. = United States Dollar

VEBA Trust = Voluntary Employees' Beneficiary Association Trust

x=Times (2x = Two Times, 0.25x = 1/4 Times, 1.25x = One and 1/4 Times)

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