

Ohio Police & Fire Pension Fund

Information Required Under
Governmental Accounting Standards
Board

Statement No. 67 for Dec. 31, 2017
and Statement No. 68 for 2018

May 8, 2018

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Document Version: 1.0 (March 2017). BR758

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May 8, 2018

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

Dear Scott,

This report provides certain pension information for disclosure under GASB 67 for OP&F's fiscal year ending Dec. 31, 2017, and collective amounts under GASB 68 for contributing employers and the State of Ohio for their fiscal years ending in 2018, including Dec. 31, 2018.

The information is based on an actuarial valuation performed by Conduent as of Jan. 1, 2017, with actuarial liabilities rolled forward to Dec. 31, 2017, and plan asset information provided by OP&F for its fiscal year ended Dec. 31, 2017. This valuation is used for accounting purposes and is different than the actuarial valuation presented to the Board of Trustees in October 2017, which was used for funding purposes.

This report presents the follow information for GASB 67 purposes:

- Net pension liability at year-end
- Schedule of changes in net pension liability from the prior year
- Sensitivity of the net pension liability to changes in the discount rate
- Information supporting the discount rate

This report presents the following information for GASB 68 purposes:

- Collective pension expense
- Collective deferred outflow (inflow) of resources

We certify that the information contained in this Actuarial Report has been prepared in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information fairly presents the actuarial position of OP&F in accordance with the requirements of GASB 67 and GASB 68.

The Board of Trustees and staff of OP&F and its auditors may use this report for the review of the operation of the plan. The report may also be used by participating employers and the state for use in preparing their audited financial statements as well as allowing the Board and staff to do so. Use of this report for any other purpose or by anyone else may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Conduent will accept no liability based on any statements or conclusions contained in this report without Conduent's prior written consent.

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. An analysis of the potential range of such future differences is beyond the scope of this valuation.

In preparing the actuarial results, we have relied upon information provided by the staff of OP&F regarding plan provisions, plan participants, plan assets, contribution rates and other matters used in the actuarial valuation. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The accuracy of the results presented herein is dependent on the accuracy of the data.

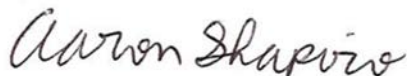
As required under Section 742.14 (B) of the Chapter 742 of the Ohio Revised Code (ORC), experience studies are performed once in every five year period. This valuation was prepared on the basis of the demographic and economic assumptions that were selected on the basis of the Jan. 1, 2012 to Dec. 31, 2016 Experience Review and adopted by the Board of Trustees, which include an 8.00 percent per annum rate of investment return. As mandated by the Retirement Code, these assumptions will remain in effect for valuation purposes until such time the Board of Trustees adopts revised assumptions.

An assumption under GASB 67 and GASB 68 that is based in part on the plan's assumed investment rate of return is the discount rate used for measuring total pension liability. The discount rate derived as of Dec. 31, 2017 is 8.00 percent, which is changed from 8.25 percent last year.

In our opinion, the actuarial assumptions used are appropriate for purposes of the valuation and are reasonably related to the experience of the System and to reasonable long-term expectations. The mortality improvement assumption was selected in accordance with Actuarial Standard of Practice No. 35.

This report was prepared under our supervision. We are Members of the American Academy of Actuaries. We meet the Academy's qualification Standards to issue this Statement of Actuarial Opinion. This report has been prepared in accordance with all applicable Actuarial Standards of Practice and we are available to answer questions about it.

Sincerely,



Aaron Shapiro, FSA, EA, MAAA
Principal, Retirement Consulting
aaron.shapiro@conduent.com



Wendy Ludbrook FSA, EA, MAAA
Sr. Consultant, Retirement Consulting
wendy.ludbrook@conduent.com

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Section I – Overview

This report provides certain information for disclosure under:

- GASB 67 for OP&F's fiscal year ending Dec. 31, 2017,
- GASB 68 for contributing employers and the State of Ohio for their fiscal years ending in 2018, including Dec. 31, 2018

The information is based on an actuarial valuation performed by Conduent as of Jan. 1, 2017, with actuarial liabilities rolled forward to Dec. 31, 2017, and plan asset information provided by OP&F for its fiscal year ended Dec. 31, 2017.

In October 2017, Conduent presented the Jan. 1, 2017 Actuarial Valuation of Pension Benefits report to the Board of Trustees. That report was for a separate valuation performed in accordance with Chapter 742 of the Ohio Revised Code (ORC), which provided information about the funded status of the plan and the adequacy of the contributions to satisfy the 30-year funding requirements under the ORC. Unless noted otherwise in this report for GASB 67 and GASB 68, the census information, plan provisions and actuarial assumptions and methods used for that valuation are also used for this valuation under GASB 67 and GASB 68.

This report presents the follow information for GASB 67 purposes:

- Net pension liability at year-end
- Schedule of changes in net pension liability from last year
- Sensitivity of the net pension liability to changes in the discount rate
- Information supporting the discount rate

This report presents the following information for GASB 68 purposes:

- Collective pension expense
- Collective deferred outflow (inflow) of resources

This report does not include any allocation of amounts by employer.

Key Takeaways and Changes since Last Year

Net pension liability decreased from \$6.33 billion last year to \$6.14 billion this year. Pension expense decreased from \$781.8 million to \$731.9 million. The decreases are due to plan experience and actuarial assumptions which were effective Jan. 1, 2017 and recommended by the actuary based on a five-year experience review covering the period 2012-2016.

Market volatility in the plan's assets can result in large fluctuations in the net fiduciary position, net pension liability, and pension expense from year to year. Unlike pension funding for OP&F, which uses an actuarial value of assets to mitigate the impact of market volatility, GASB 67 and 68 use the market value of assets.

There have been no plan amendments adopted or since the Jan. 1, 2017 valuation date. Changes in assumptions effective Jan. 1, 2017 can be found in Table 9 of the Jan. 1, 2017 Actuarial Valuation of Pension Benefits report. The assumed investment rate of return and the discount rate is 8.00 percent.

Section I – Overview (continued)

Plan Provisions

This plan is a defined benefit pension plan. A description of the plan provisions is provided in Table 10 of the Jan. 1, 2017 Actuarial Valuation of Pension Benefits report.

Contributions

Employer and member contributions are established by statute and both are due monthly. Employers of police officers pay 19.5 percent of salary; employers of firefighters pay 24 percent of salary. The State of Ohio also makes a contribution to OP&F. The current member contribution rate is 12.25 percent, effective for July 2, 2015 and thereafter.

OP&F allocates a portion of the contributions to the Health Care Stabilization Fund (HCSF) and the rest to the pension fund. The allocation to the HCSF for 2017 was 0.5 percent of salary.

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

Census Data

Detailed demographic statistics can be found in Exhibits I through VI of the Jan. 1, 2017 Actuarial Valuation of Pension Benefits report. The following is a summary of the membership counts and the development of the average expected remaining years of service as of Jan. 1, 2017. The average expected remaining years of service is used for the recognition period of certain amounts under GASB 68. The period is 6.24 years for the measurement year 2017, compared to 6.10 years for 2016.

<u>As of 1/1/2017, based on 1/1/2017 actuarial valuation</u>			
<u>Member Group</u>	<u>Count</u>	<u>Expected Remaining Years of Service</u>	<u>Average Years</u>
Active	27,990	375,593	13.42
Vested former members	200	-	0.00
Retirees and disableds	20,996	-	0.00
Beneficiaries and Survivors	7,917	-	0.00
Contributions Refund Due	3,114	-	0.00
Total	60,217	375,593	6.24

Rehired retirees are included in the count of retirees.

Asset Data

The asset information for the fiscal year ended Dec. 31, 2017 was submitted to Conduent by OP&F. A copy of the information is in Schedule C in the Appendix of this report.

OP&F reported investment income of \$1.81 billion for 2017 for the pension fund. The money-weighted rate of return was 13.49 percent.

Section I – Overview (continued)

Actuarial Assumptions and Methods

The total pension liability as of Dec. 31, 2017 was determined by rolling forward the Jan. 1, 2017 total pension liability, determined based on the Jan. 1, 2017 actuarial valuation, one year. The rolled up amount was determined by adding service cost and interest for one year and subtracting benefits adjusted for one half year of interest. Unless stated otherwise below, the assumptions and methods are the same as the Jan. 1, 2017 funding valuation as set forth in Table 9 of the Jan. 1, 2017 Actuarial Valuation of Pension Benefits report.

Actuarial Cost Method

The cost method is the prescribed method under GASB 67, which is the Entry Age Normal - Level Percentage of Pay method. This method is similar to the method used for the funding valuation except for the treatment of active members in DROP. Under the funding method, the accrual of normal cost continues until the member's assumed retirement age. Under GASB 67, for active members in DROP, the accrual stops when the member actually enters DROP; future normal cost accruals, or service cost accruals as they are called under GASB 67, are zeroed out and are instead immediately recognized in the total pension liability. Thus, when a member enters DROP, there will be a sudden increase in the total pension liability and a reduction in the service cost on account of that member.

Under GASB 67, member DROP balances are included in both the total pension liability and the plan fiduciary net position. OP&F must disclose the terms of the DROP and the total of the DROP balances held by the plan.

Assets are valued on a fair market basis, with no actuarial smoothing.

The Long-Term Expected Rate of Return

The long-term expected rate of return on pension plan investments is the actuarial valuation interest rate used for the Jan. 1, 2017 funding valuation, which is 8.00 percent. The rate was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Section I – Overview (continued)

Discount Rate

The discount rate is the single rate that reflects (1) the long-term expected rate of return on plan investments that are expected to be used to finance the payment of benefits, to the extent that the plan's fiduciary net position is projected to be sufficient to make projected benefit payments and plan assets are expected to be invested using a strategy to achieve that return, and (2) a yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher (or equivalent quality on another scale), to the extent that the conditions for use of the long-term expected rate of return are not met.

The discount rate used to measure the total pension liability is 8.00 percent. The projection of cash flows used to determine the discount rate assumes OP&F contributions will continue to follow the current statutory contribution rates, previously described. The plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability, in accordance with the method prescribed by GASB 67. We believe this assumption is reasonable for the purposes of the measurements required by the plan. In the event of benefit payments not covered by the Plan's fiduciary net position, a municipal bond rate of 3.16 percent would have been used to discount the benefit payments not covered by the Plan's fiduciary net position. The 3.16 percent rate equals the S&P Municipal Bond 20-Year High Grade Rate Index (yield to maturity) at Dec. 29, 2017. Please refer to Schedule A in the Appendix for additional details.

Recognition Periods for Deferred Inflows and Outflows of Resources

Inflows and outflows due to investment earnings are recognized in pension expense over five years. All other amounts are recognized over the average expected remaining years of service as of the beginning of the year for which the inflow or outflow amount was established.

Section II – GASB 67 Information

The GASB 67 information in this section is for the system’s fiscal year ended Dec. 31, 2017. Elements of the GASB 67 information are also used for employer disclosure under GASB 68 for their fiscal years ending in 2018, presented in Section III.

Net Pension Liability

Net pension liability is the difference between total pension liability and plan fiduciary net position. Total pension liability as of Dec. 31, 2017 is based on the Jan. 1, 2017 actuarial valuation. The components of net pension liability and related ratios for the current and prior measurement dates are as follows:

Net Pension Liability (Asset)	Measurement Date Dec. 31, 2017	Measurement Date Dec. 31, 2016
Total pension liability	\$ 21,101,065,550	\$ 20,016,288,888
Plan fiduciary net position	14,963,614,004	13,682,389,240
Net pension liability (asset)	<u>\$ 6,137,451,546</u>	<u>\$ 6,333,899,648</u>
Plan fiduciary net position as a percentage of the total pension liability	70.91%	68.36%
Covered employee payroll	\$ 2,224,675,422 (Estimate)	\$ 2,094,550,962 (Estimate)
Net pension liability (asset) as a percentage of covered employee payroll	275.88%	302.40%

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability calculated using the current discount rate of 8.00 percent, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (7.00 percent) or 1-percentage-point higher (9.00 percent) than the current rate:

Sensitivity of the Net Pension Liability to Changes in the Discount Rate at Dec. 31, 2017	1% Decrease	Current Discount Rate	1% Increase
Discount rate	7.00%	8.00%	9.00%
Total pension liability	\$ 23,471,731,174	\$ 21,101,065,550	\$ 19,167,570,790
Plan fiduciary net position	<u>14,963,614,004</u>	<u>14,963,614,004</u>	<u>14,963,614,004</u>
Net pension liability (asset)	<u>\$ 8,508,117,170</u>	<u>\$ 6,137,451,546</u>	<u>\$ 4,203,956,786</u>

Section II – GASB 67 Information (continued)

Changes in Net Pension Liability

Net pension liability increases if the total pension liability increases greater than the increase in fiduciary net position, and vice versa. Total pension liability increases with service cost and interest, but decreases by benefits paid. Fiduciary net position increases by contributions and earnings, but decreases by benefits and expenses paid. Other factors that impact the net pension liability are the impact of plan changes, changes in assumptions and plan experience.

The change in net pension liability for the year ended Dec. 31, 2017 is shown below. During 2017, there were no plan changes but were changes in actuarial assumptions due to experience study. The differences between expected and actual experience for 2017 represents the impact of plan experience during the 2016 fiscal year. Since the year-end total pension liability is rolled forward from the beginning of year valuation date assuming all assumptions are met, there are no differences between the expected and actuarial experience during the current year. Actual experience for 2017 will be reflected in 2018. Comparable results from the prior fiscal year are also shown.

Schedule of Changes in Net Pension Liability	Fiscal Year Ending Dec. 31, 2017	Fiscal Year Ending Dec. 31, 2016
Total pension liability		
Service cost	\$ 289,911,106	\$ 273,592,476
Interest	1,623,441,004	1,570,560,385
Plan changes	-	-
Differences between expected and actual experience	109,199,474	2,143,161
Changes in assumptions	318,479,524	-
Benefit payments, including refunds of member contributions	<u>(1,256,254,446)</u>	<u>(1,187,020,466)</u>
Net change in total pension liability	1,084,776,662	659,275,556
Total pension liability - beginning	<u>20,016,288,888</u>	<u>19,357,013,332</u>
Total pension liability - ending (a)	<u>\$ 21,101,065,550</u>	<u>\$ 20,016,288,888</u>
Plan fiduciary net position		
Contributions - employer and State	\$ 462,394,203	\$ 455,143,532
Contributions - member	282,006,793	268,594,295
Net investment income	1,812,565,572	1,240,580,488
Benefit payments, including refunds of member contributions	(1,256,254,446)	(1,187,020,466)
Administrative expense	(19,487,358)	(18,851,765)
Other changes	-	-
Net change in plan fiduciary net position	<u>1,281,224,764</u>	<u>758,446,084</u>
Plan fiduciary net position - beginning	<u>13,682,389,240</u>	<u>12,923,943,156</u>
Plan fiduciary net position - ending (b)	<u>\$ 14,963,614,004</u>	<u>\$ 13,682,389,240</u>
Net pension liability (asset) - ending (a)-(b)	<u>\$ 6,137,451,546</u>	<u>\$ 6,333,899,648</u>

Section III – GASB 68 Information

The GASB 68 information in this section is for disclosure by contributing employers and the State of Ohio for their fiscal years ending in 2018, including Dec. 31, 2018. The allocation of the collective amounts by employer is performed by OP&F and is not part of this report.

Pension Expense

The following table shows the collective pension expense for 2018, based on the 2017 measurement year, reflecting deferred inflows and outflows of resources that are recognized during the year. Details of the recognized and deferred inflows and outflows of resources are shown in Schedule B in the Appendix. To the extent OP&F determines there are any employer-specific liabilities and related pension expense, the collective pension expense may need to be reduced to reflect those employer specific amounts before allocating the remainder of the pension expense to all employers. Comparable results from the prior measurement period are also shown.

Pension Expense	Measurement Year Ending Dec. 31, 2017	Measurement Year Ending Dec. 31, 2016
Employer's fiscal year ending in	<u>2018</u>	<u>2017</u>
Service cost	\$ 289,911,106	\$ 273,592,476
Interest cost on total pension liability	1,623,441,004	1,570,560,385
Projected earnings on plan investments	(1,073,337,507)	(1,046,337,266)
Contributions - member	(282,006,793)	(268,594,295)
Administrative expense	19,487,358	18,851,765
Plan changes	-	-
Other changes in fiduciary net position	-	-
<u>Recognition of net deferred outflows (inflows)</u>		
Changes in assumptions	51,038,386	-
Differences between expected and actual liab. experience	14,370,756	(3,129,160)
Difference between projected and actual earnings	<u>89,024,475</u>	<u>236,870,088</u>
Pension expense	731,928,785	781,813,993

Section III – GASB 68 Information (continued)

Pension expense is generally the difference in net pension liability from one measurement date to the next, with the exception of certain amounts that are called deferred inflows and outflows of resources and employer contributions. Inflows are amounts that reduce the net pension liability, while outflows increase the net pension liability. A portion of inflow and outflows are recognized in the current year's pension expense and the rest is deferred and recognized in future years.

The following table shows the change in net pension liability for the 2017 measurement year, isolating the amounts that are subject to deferral. Comparable results from the prior measurement period are also shown.

Change in Net Pension Liability	Measurement Year Ending Dec. 31, 2017	Measurement Year Ending Dec. 31, 2016
Employer's fiscal year ending in	<u>2018</u>	<u>2017</u>
Service cost	\$ 289,911,106	\$ 273,592,476
Interest cost on total pension liability	1,623,441,004	1,570,560,385
Projected earnings on plan investments	(1,073,337,507)	(1,046,337,266)
Contributions - employer ⁽¹⁾	(462,394,203)	(455,143,532)
Contributions - member	(282,006,793)	(268,594,295)
Administrative expense	19,487,358	18,851,765
Plan changes	-	-
Other changes in fiduciary net position	-	-
<u>Amounts subject to deferral</u>		
Changes in assumptions	318,479,524	-
Difference between expected and actual liability experience	109,199,474	2,143,161
Difference between projected and actual earnings	<u>(739,228,065)</u>	<u>(194,243,222)</u>
Net change in net pension liability	(196,448,102)	(99,170,528)
Net pension liability (asset) - beginning	<u>6,333,899,648</u>	<u>6,433,070,176</u>
Net pension liability (asset) - ending	6,137,451,546	6,333,899,648

(1) Includes State of Ohio Subsidies of \$346,475 for 2017 and \$398,161 for 2016

Section III – GASB 68 Information (continued)

One of the inflow and outflow of resources is the amount by which the investment earnings during the year is more or less than the projected earnings based on the assumed long-term investment return rate. The following table derives the projected earnings for 2017 and shows that the actual earnings were greater than the projected earnings, which results in an inflow of resources. Comparable results from the prior measurement period are also shown.

Difference Between Projected and Actual Earnings	Measurement Year Ending Dec. 31, 2017	Measurement Year Ending Dec. 31, 2016
a) Plan fiduciary net position - beginning	\$ 13,682,389,240	\$ 12,923,943,156
b) Contributions - employer ⁽¹⁾	462,394,203	455,143,532
c) Contributions - member	282,006,793	268,594,295
d) Benefit payments, including refunds of member contributions	(1,256,254,446)	(1,187,020,466)
e) Administrative expense	(19,487,358)	(18,851,765)
f) Other changes	-	-
g) Assumed investment rate of return - beginning	8.00%	8.25%
h) Total projected earnings: [(a) + .5 x [(b)+(c)+(d)+(e)] + (f)] x (g)	1,073,337,507	1,046,337,266
i) Actual earnings	1,812,565,572	1,240,580,488
j) Difference between projected and actual earnings: (h)-(i)	(739,228,065)	(194,243,222)

(1) Includes State of Ohio Subsidies of \$346,475 for 2017 and \$398,161 for 2016

Reconciliation of Balance Sheet Amounts

The net pension liability at the end of the measurement period should equal the net pension liability at the beginning of the period, plus pension expense, plus the change in net deferred inflows (outflows), minus employer contributions. The following table shows the reconciliation of net pension liability for the measurement period ending Dec. 31, 2017. Comparable results from the prior measurement period are also shown.

Reconciliation of Balance Sheet Amounts	Measurement Year Ending Dec. 31, 2017	Measurement Year Ending Dec. 31, 2016
Net pension liability (asset) - beginning	\$ 6,333,899,648	\$ 6,433,070,176
Pension expense	731,928,785	781,813,993
Net deferred inflows (outflows) - beginning	(603,152,370)	(1,028,993,359)
Net deferred (inflows) outflows - ending	137,169,686	603,152,370
Contributions - employer ⁽¹⁾	(462,394,203)	(455,143,532)
Net pension liability (asset) - ending	6,137,451,546	6,333,899,648

(1) Includes State of Ohio Subsidies of \$346,475 for 2017 and \$398,161 for 2016

APPENDIX

Schedule A - Development of Discount Rate - Projection of Fiduciary Net Position

This projection is used only for determining if the plan has a crossover point for developing the discount rate under GASB 67 as of Dec. 31, 2017. For this projection, member contributions and benefit payments do not include amounts for future new members. Employer contributions include projected amounts for current members, plus amounts for new members to the extent the employer contribution rate exceeds the employer normal cost rate for the new members. Assumes all actuarial assumptions are met. Administrative expenses are based on the most recent fiscal year end, assumed to increase annually at an assumed inflation rate of 2.75 percent. Actual benefit payments may vary significantly from projected amounts year to year due to variations in DROP lump sum distributions from year to year.

Since the projection does not produce a crossover point, the discount rate will be the assumed investment rate of return of 8.00 percent.

Fiscal Year Beginning Jan. 1	Projected Beginning Fiduciary Net Position (a)	Projected Member Contributions (b)	Projected Employer Contributions (c)	Projected Benefit Payments (d)	Projected Administrative Expenses (e)	Projected Investment Earnings (f)	Projected Ending Fiduciary Net Position (g)=sum (a) thru (f)
2018	14,963,614,004	277,165,003	477,532,713	(1,360,285,476)	(15,604,316)	1,172,719,454	15,515,141,382
2019	15,515,141,382	264,640,990	479,888,227	(1,423,400,877)	(16,033,435)	1,213,949,847	16,034,186,134
2020	16,034,186,134	262,085,704	486,543,391	(1,472,853,332)	(16,474,354)	1,253,676,926	16,547,164,468
2021	16,547,164,468	258,880,757	492,795,433	(1,518,843,426)	(16,927,399)	1,293,012,745	17,056,082,579
2022	17,056,082,579	253,835,943	497,908,691	(1,591,021,054)	(17,392,902)	1,330,879,054	17,530,292,310
2023	17,530,292,310	249,038,443	503,336,261	(1,635,283,696)	(17,871,207)	1,367,085,341	17,996,597,452
2024	17,996,597,452	242,756,898	507,810,022	(1,719,032,217)	(18,362,665)	1,401,014,057	18,410,783,547
2025	18,410,783,547	235,317,280	511,177,277	(1,765,096,520)	(18,867,639)	1,432,162,249	18,805,476,194
2026	18,805,476,194	227,578,318	514,230,224	(1,800,790,025)	(19,386,499)	1,462,133,197	19,189,241,409
2027	19,189,241,409	219,388,058	518,445,005	(1,860,702,043)	(19,919,627)	1,490,307,162	19,536,759,964
2028	19,536,759,964	211,334,228	522,766,382	(1,924,935,294)	(20,467,417)	1,515,420,829	19,840,878,692
2029	19,840,878,692	202,536,936	526,808,447	(1,984,729,742)	(21,030,271)	1,537,195,931	20,101,659,993
2030	20,101,659,993	193,319,543	530,840,151	(2,044,027,373)	(21,608,604)	1,555,506,035	20,315,689,745
2031	20,315,689,745	183,982,747	535,437,803	(2,090,400,784)	(22,202,840)	1,570,599,933	20,493,106,604
2032	20,493,106,604	174,617,988	540,439,825	(2,134,784,153)	(22,813,418)	1,582,856,995	20,633,423,841
2033	20,633,423,841	165,425,432	546,414,042	(2,176,029,649)	(23,440,787)	1,592,313,424	20,738,106,302
2034	20,738,106,302	156,182,322	552,772,556	(2,206,942,696)	(24,085,409)	1,599,336,834	20,815,369,909
2035	20,815,369,909	147,116,388	560,383,733	(2,231,778,509)	(24,747,758)	1,604,460,546	20,870,804,309
2036	20,870,804,309	138,775,875	569,217,738	(2,258,496,429)	(25,428,321)	1,607,839,803	20,902,712,974
2037	20,902,712,974	130,680,109	578,570,385	(2,283,745,292)	(26,127,600)	1,609,423,846	20,911,514,423
2038	20,911,514,423	122,853,664	589,313,657	(2,308,082,504)	(26,846,109)	1,609,259,442	20,898,012,573
2039	20,898,012,573	115,063,528	600,271,908	(2,333,029,505)	(27,584,377)	1,607,295,935	20,860,030,062
2040	20,860,030,062	106,588,382	610,652,589	(2,356,448,062)	(28,342,947)	1,603,383,609	20,795,863,633
2041	20,795,863,633	97,502,490	621,765,419	(2,380,316,988)	(29,122,378)	1,597,362,845	20,703,055,021
2042	20,703,055,021	88,330,253	633,299,945	(2,386,196,162)	(29,923,244)	1,589,768,769	20,598,334,582
2043	20,598,334,582	79,712,847	646,619,831	(2,401,869,619)	(30,746,133)	1,580,928,455	20,472,979,964
2044	20,472,979,964	71,790,610	660,926,920	(2,418,092,223)	(31,591,652)	1,570,480,975	20,326,494,594
2045	20,326,494,594	63,152,868	675,034,245	(2,436,482,034)	(32,460,422)	1,558,221,197	20,153,960,448
2046	20,153,960,448	53,967,460	689,271,631	(2,451,976,894)	(33,353,084)	1,543,973,766	19,955,843,328
2047	19,955,843,328	44,299,290	704,435,228	(2,446,928,059)	(34,270,293)	1,528,502,071	19,751,881,564
2048	19,751,881,564	35,373,488	721,563,460	(2,425,450,106)	(35,212,726)	1,513,312,533	19,561,468,213
2049	19,561,468,213	27,612,136	740,073,595	(2,403,845,900)	(36,181,076)	1,499,310,700	19,388,437,668
2050	19,388,437,668	20,111,753	759,365,492	(2,361,430,276)	(37,176,056)	1,487,555,795	19,256,864,375

APPENDIX



Schedule A – Development of Discount Rate - Projection of Fiduciary Net Position (Cont'd)

Fiscal Year Beginning Jan. 1	Projected Beginning Fiduciary Net Position (a)	Projected Member Contributions (b)	Projected Employer Contributions (c)	Projected Benefit Payments (d)	Projected Administrative Expenses (e)	Projected Investment Earnings (f)	Projected Ending Fiduciary Net Position (g)=sum (a) thru (f)
2051	19,256,864,375	13,797,181	779,788,344	(2,302,536,419)	(38,198,398)	1,479,853,734	19,189,568,818
2052	19,189,568,818	9,004,172	801,420,127	(2,242,066,298)	(39,248,854)	1,477,461,745	19,196,139,710
2053	19,196,139,710	5,374,709	824,502,324	(2,176,664,111)	(40,328,197)	1,481,273,972	19,290,298,407
2054	19,290,298,407	2,707,960	848,979,640	(2,103,190,234)	(41,437,222)	1,492,501,216	19,489,859,768
2055	19,489,859,768	1,073,299	875,029,741	(2,025,251,800)	(42,576,746)	1,512,436,812	19,810,571,073
2056	19,810,571,073	325,808	902,498,667	(1,946,676,125)	(43,747,607)	1,542,178,640	20,265,150,457
2057	20,265,150,457	86,566	931,111,739	(1,869,762,918)	(44,950,666)	1,582,628,256	20,864,263,435
2058	20,864,263,435	30,793	960,671,908	(1,793,370,903)	(46,186,809)	1,634,663,167	21,620,071,591
2059	21,620,071,591	7,967	991,141,924	(1,715,910,581)	(47,456,946)	1,699,311,255	22,547,165,209
2060	22,547,165,209	0	1,022,669,384	(1,639,133,563)	(48,762,012)	1,777,676,071	23,659,615,089
2061	23,659,615,089	0	1,055,379,060	(1,563,558,542)	(50,102,968)	1,870,867,516	24,972,200,155

There is no crossover point in this analysis.

After 2060, the projected investment earnings will exceed the projected benefit payments and administrative expenses.

APPENDIX



Schedule B, Table 1 - Amortization of Changes in Assumptions

Measurement Year	2014	2015	2016	2017	Total	Outflows	Inflows
Amount Established	-	-	-	318,479,524			
Recognition Period	6.24	6.19	6.10	6.24			
Annual Recognition	-	-	-	51,038,386			
Amount Recognized							
2014	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-
2017	-	-	-	51,038,386	51,038,386	51,038,386	-
2018	-	-	-	51,038,386	51,038,386	51,038,386	-
2019	-	-	-	51,038,386	51,038,386	51,038,386	-
2020	-	-	-	51,038,386	51,038,386	51,038,386	-
2021	-	-	-	51,038,386	51,038,386	51,038,386	-
2022	-	-	-	51,038,386	51,038,386	51,038,386	-
2023	-	-	-	12,249,208	12,249,208	12,249,208	-
2024	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-
Deferred Balance							
2014	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-
2017	-	-	-	267,441,138	267,441,138	267,441,138	-
2018	-	-	-	216,402,752	216,402,752	216,402,752	-
2019	-	-	-	165,364,366	165,364,366	165,364,366	-
2020	-	-	-	114,325,980	114,325,980	114,325,980	-
2021	-	-	-	63,287,594	63,287,594	63,287,594	-
2022	-	-	-	12,249,208	12,249,208	12,249,208	-
2023	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-

APPENDIX



Schedule B, Table 2 - Amortization of Difference between Actual and Expected Experience

Measurement Year	2014	2015	2016	2017	Total	Outflows	Inflows
Amount Established	-	(21,544,278)	2,143,161	109,199,474			
Recognition Period	6.24	6.19	6.10	6.24			
Annual Recognition	-	(3,480,498)	351,338	17,499,916			
Amount Recognized							
2014	-	-	-	-	-	-	-
2015	-	(3,480,498)	-	-	(3,480,498)	-	(3,480,498)
2016	-	(3,480,498)	351,338	-	(3,129,160)	351,338	(3,480,498)
2017	-	(3,480,498)	351,338	17,499,916	14,370,756	17,851,254	(3,480,498)
2018	-	(3,480,498)	351,338	17,499,916	14,370,756	17,851,254	(3,480,498)
2019	-	(3,480,498)	351,338	17,499,916	14,370,756	17,851,254	(3,480,498)
2020	-	(3,480,498)	351,338	17,499,916	14,370,756	17,851,254	(3,480,498)
2021	-	(661,290)	351,338	17,499,916	17,189,964	17,851,254	(661,290)
2022	-	-	35,133	17,499,916	17,535,049	17,535,049	-
2023	-	-	-	4,199,978	4,199,978	4,199,978	-
2024	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-
Deferred Balance							
2014	-	-	-	-	-	-	-
2015	-	(18,063,780)	-	-	(18,063,780)	-	(18,063,780)
2016	-	(14,583,282)	1,791,823	-	(12,791,459)	1,791,823	(14,583,282)
2017	-	(11,102,784)	1,440,485	91,699,558	82,037,259	93,140,043	(11,102,784)
2018	-	(7,622,286)	1,089,147	74,199,642	67,666,503	75,288,789	(7,622,286)
2019	-	(4,141,788)	737,809	56,699,726	53,295,747	57,437,535	(4,141,788)
2020	-	(661,290)	386,471	39,199,810	38,924,991	39,586,281	(661,290)
2021	-	-	35,133	21,699,894	21,735,027	21,735,027	-
2022	-	-	-	4,199,978	4,199,978	4,199,978	-
2023	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-

APPENDIX

Schedule B, Table 3 - Amortization of Difference between Projected and Actual Earnings

Measurement Year	2014	2015	2016	2017	Total	Outflows	Inflows
Amount Established	279,088,933	1,099,504,726	(194,243,222)	(739,228,065)			
Recognition Period	5.00	5.00	5.00	5.00			
Annual Recognition	55,817,787	219,900,946	(38,848,645)	(147,845,613)			
Amount Recognized							
2014	55,817,787				55,817,787	55,817,787	-
2015	55,817,787	219,900,946			275,718,733	275,718,733	-
2016	55,817,787	219,900,946	(38,848,645)		236,870,088	275,718,733	(38,848,645)
2017	55,817,787	219,900,946	(38,848,645)	(147,845,613)	89,024,475	275,718,733	(186,694,258)
2018	55,817,785	219,900,946	(38,848,645)	(147,845,613)	89,024,473	275,718,731	(186,694,258)
2019	-	219,900,942	(38,848,645)	(147,845,613)	33,206,684	219,900,942	(186,694,258)
2020	-	-	(38,848,642)	(147,845,613)	(186,694,255)	-	(186,694,255)
2021	-	-	-	(147,845,613)	(147,845,613)	-	(147,845,613)
2022	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-
Deferred Balance							
2014	223,271,146				223,271,146	223,271,146	-
2015	167,453,359	879,603,780			1,047,057,139	1,047,057,139	-
2016	111,635,572	659,702,834	(155,394,577)		615,943,829	771,338,406	(155,394,577)
2017	55,817,785	439,801,888	(116,545,932)	(591,382,452)	(212,308,711)	495,619,673	(920,237,095)
2018	-	219,900,942	(77,697,287)	(443,536,839)	(301,333,184)	219,900,942	(822,567,310)
2019	-	-	(38,848,642)	(295,691,226)	(334,539,868)	-	(669,079,736)
2020	-	-	-	(147,845,613)	(147,845,613)	-	(295,691,226)
2021	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-

APPENDIX



Schedule C - Statement of Changes in Fiduciary Net Position

Source: OP&F May 2, 2018

Statements of Changes in Fiduciary Net Position For The Year Ended Dec. 31, 2017

	Pensions	Post-employment Health Care	2017 Total
Additions:			
From Contributions:			
Members'	\$ 282,006,793	\$ -	\$ 282,006,793
Employers'	462,047,728	10,871,479	472,919,207
State of Ohio-Subsidies	346,475	-	346,475
Health Care Premiums	-	74,450,891	74,450,891
TOTAL CONTRIBUTIONS	744,400,996	85,322,370	829,723,366
From Investment Income:			
Net Appreciation (Depreciation)			
Value of Investments	1,488,638,754	95,022,365	1,583,661,119
Bond Interest	120,740,456	7,707,070	128,447,526
Dividends	92,723,677	5,918,711	98,642,388
Alternative Investment Income	83,798,632	5,349,010	89,147,642
Repurchase Agreement Interest	-	-	-
Master Limited Partnerships Income	59,561,045	3,801,884	63,362,929
Other Investment Income (Loss)	7,034,406	449,018	7,483,424
Less Investment Expenses	(48,318,984)	(3,084,284)	(51,403,268)
NET INVESTMENT INCOME	1,804,177,986	115,163,774	1,919,341,760
From Securities Lending Activities:			
Securities Lending Income	11,773,968	751,553	12,525,521
Securities Lending Expense	(7,801,256)	(497,968)	(8,299,224)
NET INCOME FROM SECURITIES LENDING	3,972,712	253,585	4,226,297
Interest on Local Funds Receivable	952,196	-	952,196
Other Income	3,462,678	24,105,358	27,568,036
TOTAL ADDITIONS	2,556,966,568	224,845,087	2,781,811,655
Deductions:			
Retirement Benefits	710,330,998	-	710,330,998
Disability Benefits	251,973,779	-	251,973,779
Health Care Benefits	-	193,595,036	193,595,036
Survivor Benefits	86,881,880	-	86,881,880
DROP Withdrawals	186,463,832	-	186,463,832
Contribution Refunds	20,603,957	-	20,603,957
Administrative Expenses	19,402,727	815,977	20,218,704
Other Expenses	84,631	-	84,631
TOTAL DEDUCTIONS	1,275,741,804	194,411,013	1,470,152,817
CHANGE IN FIDUCIARY NET POSITION	1,281,224,764	30,434,074	1,311,658,838
FIDUCIARY NET POSITION - BEG OF YEAR	13,682,389,240	901,653,715	14,584,042,955
FIDUCIARY NET POSITION - END OF YEAR	\$ 14,963,614,004	\$ 932,087,789	\$ 15,895,701,793