



Cavanaugh Macdonald
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GASB STATEMENT NO. 68 REPORT
FOR THE
BASIC BENEFITS VALUATION
OF THE
SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO
PREPARED AS OF JUNE 30, 2018





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

November 8, 2018

School Employees Retirement System of Ohio
300 East Broad Street
Suite 100
Columbus, OH 43215-3746

Ladies and Gentlemen:

Presented in this report is information to assist the School Employees Retirement System of Ohio (System) in providing necessary Governmental Accounting Standards Board (GASB) Statement No. 68 disclosure information to participating employers. GASB Statement No. 68 establishes accounting and financial reporting requirements for governmental employers who provide pension benefits to their employees through a trust. This report has been prepared as of June 30, 2018, for the fiscal year ending June 30, 2019.

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of June 30, 2018 (The Measurement Date). The valuation was based upon data, furnished by System staff, concerning active, inactive and retired members, along with pertinent financial information.

To the best of our knowledge, this report is complete and accurate. The necessary calculations were performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems.

The calculations were prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, and, in our opinion, meet the requirements of GASB 68.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.



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

Respectfully submitted,

A handwritten signature in blue ink that reads 'Todd B. Green' followed by a horizontal flourish.

Todd B. Green ASA, FCA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink that reads 'John J. Garrett' in a cursive style.

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

TBG:JJG/bvb



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**REPORT OF THE ANNUAL GASB STATEMENT NO. 68
REQUIRED INFORMATION FOR THE
SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO
PREPARED AS OF JUNE 30, 2018**

SECTION I – SUMMARY OF COLLECTIVE AMOUNTS

Valuation Date (VD):	June 30, 2018
Measurement Date (MD):	June 30, 2018
Reporting Date (RD):	June 30, 2019
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	7.50%
Municipal Bond Index Rate	3.62%
Fiscal Year in which Plan’s Fiduciary Net Position is projected to be depleted from future benefit payments for current members	N/A
Single Equivalent Interest Rate	7.50%
Net Pension Liability (Fiscal Year Ended 2017)	
Total Pension Liability (TPL)	\$ 19,588,417,687
Fiduciary Net Position (FNP)	<u>13,613,638,590</u>
Net Pension Liability (NPL = TPL – FNP)	\$ 5,974,779,097
FNP as a percentage of TPL	69.50%
Net Pension Liability (Fiscal Year Ended 2018)	
Total Pension Liability (TPL)	\$ 19,997,700,966
Fiduciary Net Position (FNP)	<u>14,270,515,748</u>
Net Pension Liability (NPL = TPL – FNP)	\$ 5,727,185,218
FNP as a percentage of TPL	71.36%
Pension Expense (PE):	\$ 440,493,538
Deferred Outflows of Resources:	\$ 443,432,210
Deferred Inflows of Resources:	\$ 158,682,855



SECTION II – INTRODUCTION

This report, prepared as of June 30, 2018 (the Measurement Date), presents information to assist the System in providing the required information under Governmental Accounting Standards Board Statement No. 68 (GASB 68) to the participating employers of the School Employees Retirement System of Ohio (SERS) for fiscal year ending June 30, 2019. Much of the material provided in this report is based on the results of the GASB 67 report for the System, which was issued on October 23, 2018. See that report for more information on the member data, actuarial assumptions and methods used in developing the GASB 67 results.

GASB 68 creates disclosure and reporting requirements that may or may not be consistent with the basis used for funding the Plan.

GASB 68 requirements include a proportionate share of a Net Pension Liability (NPL) and to recognize a proportionate share of a Pension Expense (PE) in the financial statements of each of the participating employers and non-employer contributing entities.

The NPL shown in the GASB Statement No. 67 Report for the System as of June 30, 2018 and submitted November 1, 2018 is the collective NPL used for purposes of GASB 68. Please refer to that report for the derivation of the collective NPL.

Pension Expense includes amounts for service cost (the normal cost under the Entry Age Normal actuarial cost method for the year), interest on the Total Pension Liability (TPL), changes in benefit structure, amortization of increases/decreases in liability due to actuarial experience and actuarial assumption changes, and amortization of investment gains/losses. The actuarial experience and assumption change impacts are amortized over the average expected remaining service life of the Plan membership as of the Measurement Date, and investment gains/losses are amortized over five years. The development of the collective PE is shown in Section V.

The unrecognized portions of each year's experience, assumption changes and investment gains/losses are used to develop deferred inflows and outflows, which also must be included in the employer's financial statements. The development of the collective deferred inflows and outflows is shown in Section III.

The sections that follow provide the results of all the required aggregate calculations, present in the order laid out in GASB 68 for note disclosure and Required Supplementary Information (RSI). The System will prepare the calculation of the proportional share of the NPL, Pension Expense, and Deferred Inflows and Outflows for each participating employer or non-employer contributing entity.



Section I of this report is a summary of the principal results of the collective amounts under GASB 68. Section III and Section IV provides the results of all the necessary calculations, presented in the order laid out in GASB 68 for note disclosure and Required Supplementary Information (RSI).



SECTION III – FINANCIAL STATEMENT NOTES

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

Paragraph 74: The information required to be prepared by the System and/or the individual employer.

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

Paragraphs 76(a) - (b): The information required is to be supplied by the System.

Paragraph 77: This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The actuarial assumptions utilized in developing the TPL are outlined in Schedule B. The total pension liability was determined by an actuarial valuation as of June 30, 2018, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3.00 percent
Salary increases	3.50 percent - 18.20 percent, including inflation
Investment rate of return	7.50 percent, net of pension plan investment expense, including inflation

Mortality rates were based on the RP-2014 Blue Collar Mortality Table with fully generational projection and a five year age set-back for both males and females. Mortality among service retired members, and beneficiaries were based upon the RP-2014 Blue Collar Mortality Table with fully generational projection with Scale BB, 120% of male rates, and 110% of female rates. Mortality among disable members were based upon the RP-2000 Disabled Mortality Table, 90% for male rates and 100% for female rates, set back five years is used for the period after disability retirement.

The actuarial assumptions used were based on the results of an actuarial experience study for the period ending July 1, 2010 to June 30, 2015 adopted by the Board on April 21, 2016.



Paragraph 78:

- (a) Discount rate:** The discount rate used to measure the total pension liability was 7.50%.
- (b) Projected cash flows:** The projection of cash flows used to determine the discount rate assumed that local employers would contribute the actuarially determined contribution rate of projected compensation over the remaining 27-year amortization period of the unfunded actuarial accrued liability. If the funded ratio is less than 70%, the entire 14% employers' contribution shall be allocated to SERS' basic benefits. If the funded ratio is 70% but less than 80%, at least 13.50% of the employers' contribution shall be allocated to SERS' basic benefits. If the funded ratio is 80% but less than 90%, at least 13.25% of the employers' contribution shall be allocated to SERS' basic benefits.
- (c) Long-term rate of return:** The long-term expected return on plan assets is reviewed as part of the regular experience studies prepared every five years for the System. The most recent analysis, performed for the period covering fiscal years 2010 through 2015, is outlined in a report adopted by the Board on April 21, 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, and a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected return, net of investment expense and inflation) were developed by the investment consultant for each major asset class. These ranges were 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 then adding expected inflation. The capital market assumptions developed by the investment consultant are intended for use over a 10-year horizon and may not be useful in setting the long-term rate of return for funding pension plans which covers a longer timeframe. The assumption is intended to be a long-term assumption and is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected returns in future years.
- (d) Municipal bond rate:** the discount rate determination does not use a municipal bond rate.
- (e) Periods of projected benefit payments:** projected future benefit payments for all current plan members were projected through 2129.



(f) Assumed Asset Allocation: The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Cash	1.0%	0.50%
US Equity	22.5%	4.75%
International Equity	22.5%	7.00%
Fixed Income	19.0%	1.50%
Private Equity	10.0%	8.00%
Real Assets	15.0%	5.00%
Multi-Asset Strategies	10.0%	3.0%

Sensitivity Analysis: This paragraph requires disclosure of the sensitivity of the collective net pension liability to changes in the discount rate. The following presents the net pension liability of the System, calculated using the discount rate of percent, as well as what the System’s net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.50 percent) or 1-percentage-point higher (8.50 percent) than the current rate:

	1% Decrease 6.50%	Current Discount Rate 7.50%	1% Increase 8.50%
System’s net pension liability	\$8,067,172,229	\$5,727,185,218	\$3,765,262,702

Paragraph 80(a): This paragraph requires the disclosure of the employer’s proportionate share of the Collective NPL and if an employer has as special funding situation, the portion of the non-employer contributing entities proportionate share of the collective NPL that is associated with the employer. This will be determined by the System.

Paragraph 80(b): This paragraph requires disclosure of the employer’s proportion of the collective NPL and the change in the proportion since the prior measurement date. This will be determined by the System.

Paragraph 80(c): June 30, 2018 is the actuarial valuation date upon which the TPL is based. No update procedures were used to determine the TPL.



Paragraphs 80(d): There were no changes in assumptions since the prior measurement period.

Paragraphs 80(e): There were no changes in assumptions the prior measurement period:

Paragraph 80(f): There were no changes between the measurement date of the collective net pension liability and the employer's reporting date.

Paragraph 80(g): Please see Section V of the report for the development of the collective Pension expense. PE for each employer will be determined by the System.

Paragraph 80(h): Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce pension expense they are labeled deferred inflows. If they will increase pension expense they are labeled deferred outflows. As noted in the previous section, the amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five year period.



The table below provide a summary of the deferred inflows and outflows as of the Measurement Date. The allocation of deferred inflows and outflows will be determined by the System.

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 314,099,970	\$ 0
Changes of assumptions	\$ 129,332,240	0
Net difference between projected and actual earnings on plan investments	\$ 0	\$ 158,682,855
Total	<u>\$ 443,432,210</u>	<u>\$ 158,682,855</u>



Paragraph 80(i): The collective amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Deferred Amounts to be recognized in Fiscal Years Ending	
	Deferred Outflows / (Inflows) of Resources
Year 1	\$420,203,258
Year 2	\$101,163,333
Year 3	(\$187,950,844)
Year 4	(\$48,666,392)
Thereafter	\$0

Paragraph 80(j): The amount of revenue recognized for the support provided by non-employer contributing entities for the participating employers. The System will provide this information.



SECTION IV – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in the System’s financial statements:

Paragraphs 81(a) and (b): This information will be provided by the System.

Paragraph 82: Information about factors that significantly affect trends in the amounts reported in the schedules required by paragraph 81 should be presented as notes to the schedule. Comments on additional years will be added as they occur.

Changes of benefit terms: The following changes were made to the benefit terms as identified:

2018

- With the authority granted the Board under Senate Bill 8, the Board has enacted a three-year COLA delay for future benefit recipients commencing benefits on or after April 1, 2018.

2017

- The cost-of-living adjustment was changed from a fixed 3.00% to a cost-of-living adjustment that is indexed to CPI-W not greater than 2.5% with a floor of 0% beginning January 1, 2018. In addition, with the authority granted the Board under HB 49, the Board has enacted a three-year COLA suspension for benefit recipients in calendar years 2018, 2019 and 2020.

Changes of assumption: The following changes were made to the actuarial assumptions as identified:

2016

- Assumed rate of inflation was reduced from 3.25% to 3.00%
- Payroll Growth Assumption was reduced from 4.00% to 3.50%
- Assumed real wage growth was reduced from 0.75% to 0.50
- Rates of withdrawal, retirement and disability were updated to reflect recent experience.
- Mortality among active members was updated to the following:
 - RP-2014 Blue Collar Mortality Table with fully generational projection and a five year age set-back for both males and females. The above rates represent the base rates used.
- Mortality among service retired members, and beneficiaries was updated to the following:
 - RP-2014 Blue Collar Mortality Table with fully generational projection with Scale BB, 120% of male rates, and 110% of female rates.



- Mortality among disable member was updated to the following:
 - RP-2000 Disabled Mortality Table, 90% for male rates and 100% for female rates, set back five years is used for the period after disability retirement.

Method and assumptions used in calculations of actuarially determined contributions. The actuarially determined contribution rates are determined on an annual basis for the fiscal year beginning July 1, 2018, determined as of June 30, 2018. The following actuarial methods and assumptions were used to determine contribution rates reported in that schedule:

Actuarial cost method	Entry age
Amortization method	Level percentage of payroll, closed
Remaining amortization period	26 years
Asset valuation method	4-year smoothed market
Inflation	3.00 percent
Salary increase	3.50 percent – 18.20 percent, including inflation
Investment rate of return	7.50 percent, net of pension plan investment expense, including inflation



SECTION V – PENSION EXPENSE

As noted earlier, the Pension Expense (PE) consists of a number of different items. GASB 68 refers to the first as Service Cost which is the Normal Cost using the Entry Age Normal actuarial funding method. To this is added interest on the TPL at the rate of return in effect as of the prior measurement date.

The next three items refer to any changes that occurred in the TPL (i.e., actuarial accrued liability (AAL) under EAN) due to:

1. Benefit changes,
2. Actual versus expected experience or
3. Changes in actuarial assumptions.

Benefit changes, which are reflected immediately in PE, can be positive, if there is a benefit improvement for existing Plan members, or negative if there is a benefit reduction. For the year ended June 30, 2018 the changes due to Senate Bill 8 will be recognized. This amount was \$(357,618,668).

The next item to be recognized is the portion of current year changes in TPL due to actual versus expected experience for the year. For the period ended June 30, 2018 this amount was \$286,313,613. The portion to recognize in the current year is determined by spreading the total change over the average expected remaining service life of the entire Plan membership. The remaining service life of active members is the average number of years the active members are expected to remain active. For the year ended this number is 8.15. The remaining service life of the inactive members is, of course, zero. The figure to use for the amortization is the weighted average of these two amounts, or 2.53. The development of the average remaining service life is shown in the table below.

Calculation of Weighted Average Years of Working Lifetime

Category	Number (1)	Average Years of Working Lifetime (2)
a. Active Members	157,981	8.15
b. Inactive Members	351,789	0.00
c. Total	509,770	
Weighted Average Years of Working Lifetime [(a1 * a2) + (b1 * b2)]/c1		2.53



The last items under changes in TPL are changes in actuarial assumptions. The portion to recognize in the current year is determined by spreading the total change over the average expected remaining service life of the entire Plan membership, similar to the way experience gains and losses are recognized. For the year ended June 30, 2018 there were no changes to assumptions and methods.

Member contributions for the year and projected earnings on the FNP at the discount rate serve to reduce the expense. One-fifth of current-period difference between actual and projected earning on the FNP are recognized in the pension expense.

Investment Earnings (Gain)/Loss as of June 30, 2018		
a	Expected asset return rate	7.50%
b	Beginning of year market value assets (BOY)	\$ 13,603,215,458
c	End of year market value assets (EOY)	\$ 14,270,515,748
d	Expected return on BOY for plan year (a x b)	\$ 1,020,241,159
External Cash Flow		
	Contributions - employer	\$ 435,103,620
	Contributions - member	324,842,074
	Refunds of contributions	(59,575,036)
	Benefits paid	(1,248,097,556)
	Admin expenses	(26,993,893)
d	Total net external cash flow	\$ (574,720,791)
f	Expected return on net cash flow (a x 0.5 x e)	\$ (21,552,030)
g	Projected earnings for plan year (d + f)	\$ 998,689,129
h	Net investment income (c - b - d)	\$ 1,242,021,081
	Investment earnings (gain)/loss (g - h)	(243,331,952)

The current year portions of previously determined experience, assumption, and earnings amounts, recognized as deferred inflows and outflows are included. Deferred outflows are added to the PE and deferred inflows are subtracted from the PE. Finally administrative expenses and other miscellaneous items are included.



The calculation of the collective Pension Expense for the year ended June 30, 2018 for the System is shown in the following table.

Pension Expense Determined as of the Measurement Date	
Service Cost	\$ 368,167,321
Interest on the TPL and Cash Flow	\$ 1,420,093,605
Current-period benefit changes	\$ (357,618,668)
Expensed portion of current-period difference between expected and actual experience in the total pension liability	\$ 113,167,436
Expensed portion of current-period changes of assumptions	\$ 0
Member contributions	\$ (324,842,074)
Projected earnings on plan investments	\$ (998,689,129)
Expensed portion of current-period differences between actual and projected earnings on plan investments	\$ (48,666,390)
Administrative expense	\$ 26,993,893
Other	\$ 10,423,132
Recognition of beginning deferred outflows of resources as pension expense	\$ 295,808,101
Recognition of beginning deferred inflows of resources as pension expense	\$ (64,343,689)
Pension Expense	<u>\$ 440,493,538</u>



SCHEDULE A

SUMMARY OF MAIN BENEFIT AND CONTRIBUTION PROVISIONS

This schedule summarizes the major retirement benefit provisions of School Employees Retirement System of Ohio included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Contributions for basic benefits Members contribute 10% of pay and employers contribute 14% of pay. Employer contributions not required to finance basic benefits are allocated to the health care program.

Final Average Salary Average annual salary over the member's three highest years of service.

Normal Retirement

Condition for Retirement

Retire before August 1, 2017 or have 25 years of service or more on or before August 1, 2017

Attainment of age 65 with at least five years of creditable service, or completion of 30 years of creditable service, regardless of age.

Members attaining 25 years of service after August 1, 2017

Attainment of age 67 with at least ten years of creditable service, or attainment of age 57 with at least 30 years of creditable service. Buy-up option was available.



Amount of Allowance

The annual retirement allowance payable shall not be greater than 100% of final average salary, and is the greater of:

1. Money Purchase - the greater of:
The sum of:
 - a. An annuity based on the value of the member's accumulated contributions at retirement
 - b. A pension equal to the annuity
 - c. For members who have 10 or more years of service credit prior to 10/1/1956, an annual benefit of \$180.

2. Defined Benefit - the greater of:
The sum of:
 - a. 2.2% of final average salary multiplied by the member's years of service up to 30,
 - b. 2.5% of final average salary multiplied by the member's years of service in excess of 30,or:
 - c. \$86 multiplied by the years of service.

Early Retirement

Condition for Early Retirement

Retire before August 1, 2017 or have 25 years of service or more on or before August 1, 2017

Not eligible for unreduced service retirement but has attained age 55 with at least 25 years of service, or age 60 with five years of service.

Members attaining 25 years of service after August 1, 2017

Attainment of age 62 with at least ten years of creditable service, or attainment of age 60 with at least 25 years of creditable service.



Amount of Allowance

Retire before August 1, 2017 or have 25 years of service or more on or before August 1, 2017

Normal retirement allowance accrued to the date of early retirement. The Defined Benefit amount determined above is adjusted by the following percentages based on attained age or years of service:

<u>Attained Age</u>	<u>Years of Ohio Service Credit</u>	<u>Percentage</u>
58	25	75%
59	26	80
60	27	85
61		88
	28	90
62		91
63		94
	29	95
64		97

Members attaining 25 years of service after August 1, 2017

Actuarial equivalent of the normal retirement allowance accrued to the date of early retirement. The Defined Benefit amount determined above is actuarially adjusted for the years before age 65 (age 67 if after August 1, 2017) or 30 years of service, whichever is shorter, but in no event is the adjusted benefit less than the following percentages of the Defined Benefit amount based on years of service:

<u>Years of Ohio Service Credit</u>	<u>Percentage</u>
25	75%
26	80
27	85
28	90
29	95



Disability Retirement

- Condition for Retirement An allowance is paid upon becoming permanently disabled after completion of at least 5 years of total service credit.
- Amount of Allowance
1. For those who were active members prior to July 29, 1992 and did not elect the benefit structure outlined below, an allowance based on service to date of disablement, plus, if the age at disablement is less than 60, continuous service to age 60. The allowance is computed in the same manner as the defined benefit service retirement allowance, subject to a minimum of 30% of FAS and a maximum of 75% of FAS. It is payable for life, unless terminated.
 2. For those who became active members after July 28, 1992, and for those who were active members prior to July 29, 1992 who so elected, an allowance equal to the greater of (i) 45% of FAS, or (ii) the lesser of 60% of FAS, or the allowance computed in the same manner as the defined benefit service retirement allowance. The allowance will continue until:
 - a. The date the member is granted a service retirement benefit, or
 - b. The date the allowance is terminated, or
 - c. The later of the date the member attains age 65 or the date the disability allowance has been paid for the minimum duration in accordance with the following schedule:

<u>Age at Disability</u>	<u>Minimum Duration In Months</u>
60 and earlier	60
61	60
62	48
63	48
64	36
65	36
66	24
67	24
68	24
69 and older	12



Death Benefits Prior to Retirement

Death While Eligible to Retire

If a member dies in service after becoming eligible to retire with a service allowance and leaves a surviving spouse or other sole dependent beneficiary, the survivor may elect to receive the same amount that would have been paid had the member retired the last day of the month of death and elected the 100% joint and survivor form of payment.

Survivor (Death-in-Service) Allowances

Condition for Benefit

Upon the death of a member with at least 1.5 years of Ohio service credit and with at least 0.25 year of Ohio contributing service credit within 2.5 years prior to the date of death, the survivor allowances are payable as follows:

1. **Qualified Spouse:** A monthly allowance commencing at age 62, except that the benefit is payable immediately if: (1) the qualified deceased member had 10 or more years of Ohio service credit; or (2) is caring for a surviving child, or (3) is incompetent.
2. **Qualified Child:** For allowances that commenced before January 7, 2013, an allowance is payable to a deceased member's qualified child who is under age 18 and never been married, under age 22 and in school, or adjudged incompetent prior to the member's death and the child attaining age 18 or age 22 if attending school. For allowances that commence on or after January 7, 2013, an allowance is payable to a deceased member's qualified child who is under age 19 and never been married or adjudged incompetent prior to the member's death and the child attaining age 19.
3. **Qualified Parent's Allowance:** A monthly allowance is payable to a dependent parent age 65 or more.



Amount of Allowances

Except when survived by a qualified child(ren), upon the death of a member prior to retirement, the accumulated contributions of the member without interest is payable. Alternatively, the beneficiary may elect the following amounts, payable monthly while eligible:

<u>Number of Qualified Survivors</u>	<u>Annual Benefit as Percent of Member's FAS</u>	<u>Minimum Monthly Allowance</u>
1	25%	\$96
2	40	186
3	50	236
4	55	236
5 or more	60	236

If the deceased member had attained at least 20 years of service, the total benefits payable to all qualified survivors are not less than:

<u>Years of Service</u>	<u>Annual Benefit as Percent of Member's FAS</u>
20	29%
21	33
22	37
23	41
24	45
25	48
26	51
27	54
28	57
29 or more	60

Termination Benefits

Refund of Members' Accumulated Contributions

In the event a member leaves service before any monthly benefits are payable on his/her behalf, the member's accumulated contributions, without interest, may be refunded.

Deferred Benefits

Members who retire prior to August 1, 2017 must have at least 5 years of service credit and those members who retire on and after August 1, 2017 must have at least 10 years of service credit and are eligible to draw the benefit the first of the month following their 62nd birthday.



Normal Form of Benefit

Single Life Annuity

Optional Forms of Benefit

A member upon retirement may elect to receive an allowance in one of the following forms that are computed to be actuarially equivalent to the applicable retirement allowance:

Upon the death of a retiree, 50%, 100%, or some other percentage of his/her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary.

A reduced retirement allowance shall be continued throughout the life of the pensioner, but with further payment to the pensioner, his/her beneficiary or estate for a specified number of years certain.

A member can select a partial lump-sum option at retirement. Under this option, the partial lump-sum shall not be less than 6 times and not more than 36 times the unreduced monthly benefit, and the monthly benefit will be actuarially reduced. In addition, the monthly benefit payable cannot be less than 50% of the unreduced amount.

Post-Retirement Death Benefit

Regardless of the form of benefit selected, a lump sum benefit of \$1,000 is paid at the death of the retiree.

Post-Retirement Increases

Pre 1/1/2018: On each anniversary of the initial date of retirement, the allowances of all retirees and survivors are increased by 3% of the base benefit.

On and after 1/1/2018: On each anniversary of the initial retirement, the allowance of all retirees and survivors are increased by the annual rate of increase in the CPI-W measured as of the June preceding the beginning of the applicable calendar year. The annual rate of increase shall not be less than 0% nor greater than 2.5%. COLA's shall be suspended for calendar years 2018, 2019, and 2020.



On and after 4/1/2018: COLA's for future retirees will be delayed for three years following commencement.

Medicare Part B

Each recipient of a service retirement benefit, a disability benefit, or a survivor benefit who was credited with at least 10 years of service and has paid Medicare Part B premiums and has chosen the health care option, is reimbursed \$45.50 per month for premiums. The reimbursement will continue to the spouse upon the death of the retiree in cases where the retiree elected a Joint and Survivor payment form.

Reemployed Retirants

Eligibility Effective

July 1, 1991, service retirees of SERS, or service or disability retirees of one of the other four Ohio retirement systems who are employed in a SERS-covered position are required to contribute to a money purchase annuity, a type of defined contribution plan.

Amount of Allowance

Upon termination of employment, a reemployed retirant who has attained age 65 is eligible to receive an annuity based on the amount of his/her accumulated contributions, and an equal amount of employer contributions, plus interest to the effective date of retirement. Effective July 1, 2006 the amount of employer contributions will be determined by the Board. Interest is granted on the reemployed retirant's prior fiscal year account balance, calculated using a rate determined by the SERS Board, compounded annually. The benefit is payable as a lump sum or as an annuity if the amount of such annuity is at least \$25. Upon termination of employment, a reemployed retirant who has not attained age 65 may request a lump sum refund of his/her own contributions; there is no payment of employer contributions or interest.

Benefits Payable Upon Death

If a reemployed retirant dies while employed, a lump sum payment of the monthly annuity, discounted to the present value using the current actuarial assumption rate of interest, will be paid to his/her beneficiary.

If a reemployed retirant dies while receiving a monthly annuity, a lump sum payment will be made to a beneficiary in an amount equal to the excess, if any, of the lump sum payment the reemployed retirant would have received at



the effective date of retirement over the sum of the annuity payments received by the reemployed retirant to the date of death.

Member Contributions	Each reemployed retirant is required to contribute 10% of his/her pay by payroll deductions.
Employer Contributions	Employer contributions are expressed as percents of member covered payroll. Employers are required to contribute 14% of payroll.
Other Benefits	Reemployed retirants of SERS are not eligible to receive any of the other benefits provided to SERS members.
Member Contributions	10% of salary.



SCHEDULE B

STATEMENT OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the valuation were based on the actuarial experience study for the five-year period ending June 30, 2015, adopted by the Board on April 21, 2016

INTEREST RATE: 7.50% per annum, compounded annually (net after all System expenses).

SEPARATIONS FROM ACTIVE SERVICE: Representative values of the assumed rates of separation from active service are as follows:

Service	Annual Rates of Withdrawal
0	45.00%
1	31.00
2	23.00
3	17.00
4	13.00
5	10.50
10	4.00
15	2.00
20	2.00
25	1.50

Age	Annual Rates of			
	Death *		Disability	
	Male	Female	Male	Female
20	.022%	.013%	.020%	.010%
25	.053	.018	.038	.010
30	.063	.019	.068	.026
35	.059	.024	.122	.055
40	.068	.032	.212	.102
45	.081	.044	.311	.170
50	.126	.074	.411	.300
55	.218	.124	.530	.450
60	.361	.188	.590	.450
65	.607	.274	.550	.300
70	1.071	.415	.300	.200
74	1.570	.629	.300	.200

* Pre-retirement mortality is based on the RP-2014 Blue Collar Mortality Table with fully generational projection and a five year age set-back for both males and females. The above rates represent the base rates used.



Age	Annual Rates of							
	Retirement Eligible prior to 8/1/17				Retirement Eligible after 8/1/17			
	Reduced	Reduced (55/25)	First Eligible Unreduced	Subsequent Unreduced	Reduced	Reduced (60/25)	First Eligible Unreduced	Subsequent Unreduced
50			27%	19%				
55		10%	27%	19%				
60	11%	14%	27%	19%		14%	30%	19%
65			25%	19%	11%	14%	30%	19%
70			20%	22%			30%	22%
75			100%	100%			100%	100%

SALARY INCREASES: Representative values of the assumed annual rates of salary increases are as follows:

Service	Annual Rates of		
	Merit & Seniority (A)	Base (Economy) (B)	Increase Next Year (1+(A))*(1+(B))
0	14.20%	3.50%	18.20%
1	5.55	3.50	9.25
2	3.14	3.50	6.75
3	2.17	3.50	5.75
4	1.45	3.50	5.00
5	1.20	3.50	4.75
6	0.97	3.50	4.50
7	0.72	3.50	4.25
8	0.48	3.50	4.00
9	0.24	3.50	3.75
10 & over	0.00	3.50	3.50

PAYROLL GROWTH: 3.50% per annum, compounded annually.

PRICE INFLATION: 3.00% per annum, compounded annually.

ANNUAL COLA: Increase of 2.50% of initial retirement allowance on anniversary of retirement date. On and after April 1, 2018, COLA's for future retirees will be delayed for three years following commencement.

DEATH AFTER RETIREMENT: The RP-2014 Blue Collar Mortality Table with fully generational projection and Scale BB, 120% of male rates and 110% of female rates is used to evaluate allowances to be paid. The RP-2000 Disabled Mortality Table with 90% for male rates



and 100% for female rates set back five years is used for the period after disability retirement. These assumptions are used to measure the probabilities of each benefit payment being made after retirement.

MARRIAGE ASSUMPTION: 80% married with the husband three years older than his wife.

VALUATION METHOD: Entry age normal cost method. Entry age is established on an individual basis.

ASSET VALUATION METHOD: Actuarial value, as developed in Schedule A. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected market value of assets, based on the assumed valuation rate of return. The amount recognized each year is 25% of the difference between market value and expected market value. The actuarial value of assets cannot be less than 80% or more than 120% of market value.

FUNDING POLICY: If the funded ratio is less than 70%, the entire 14% employers' contribution shall be allocated to SERS' basic benefits. If the funded ratio is 70% but less than 80%, at least 13.50% of the employers' contribution shall be allocated to SERS' basic benefits, with the remainder (if any) allocated to the Health Care Fund. If the funded ratio is 80% but less than 90%, at least 13.25% of the employers' contribution shall be allocated to SERS' basic benefits, with the remainder (if any) allocated to the Health Care Fund. If the funded ratio is 90% or greater, the Health Care Fund may receive any portion of the employers' contribution that is not needed to fund SERS' basic benefits.



SCHEDULE C

SCHEDULE OF DIFFERENCES BETWEEN EXPECTED AND ACTUAL EXPERIENCE

Increase/(Decrease) in Pension Expense Arising from the Recognition of the Effects of the Differences Between Expected and Actual Experience								
Year	Difference Between Expected and Actual Experience	Recognition Period (Years)	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	Thereafter
2013-2014	\$53,951,305	4.96	\$10,442,189	\$0	\$0	\$0	\$0	\$0
2014-2015	\$78,749,615	4.13	\$19,067,703	\$2,478,803	\$0	\$0	\$0	\$0
2015-2016	\$50,307,199	3.72	\$13,523,441	\$9,736,876	\$0	\$0	\$0	\$0
2016-2017	\$275,031,424	3.76	\$73,146,655	\$73,146,655	\$55,591,459	\$0	\$0	\$0
2017-2018	\$286,313,613	2.53	\$113,167,436	\$113,167,436	\$59,978,741	\$0	\$0	\$0
			\$229,347,424	\$198,529,770	\$115,570,200	\$0	\$0	\$0



**DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES ARISING FROM DIFFERENCES
BETWEEN EXPECTED AND ACTUAL EXPERIENCE**

Year	Experience Losses (a)	Experience Gains (b)	Amounts Recognized in		
			Pension Expense Through June 30, 2018 (c)	Deferred Outflows of Resources (a) – (c)	Deferred Inflows of Resources (b) – (c)
2013-2014	\$53,951,305	\$0	\$53,951,305	\$0	\$0
2014-2015	\$78,749,615	\$0	\$76,270,812	\$2,478,803	\$0
2015-2016	\$50,307,199	\$0	\$40,570,323	\$9,736,876	\$0
2016-2017	\$275,031,424	\$0	\$146,293,310	\$128,738,114	\$0
2017-2018	\$286,313,613	\$0	\$113,167,436	\$173,146,177	\$0
			\$430,253,186	\$314,099,970	\$0



SCHEDULE OF DIFFERENCES BETWEEN PROJECTED AND ACTUAL EARNINGS ON PENSION PLAN INVESTMENTS

Year	Difference Between Projected and Actual Earnings on Pension Plan Investments	Recognition Period (Years)	Increase/(Decrease) in Pension Expense Arising from the Recognition of the Effects of the Differences Between Projected and Actual Earnings on Pension Plan Investments					
			2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	Thereafter
2013-2014	(\$1,026,756,634)	5.0	(\$205,351,326)	\$0	\$0	\$0	\$0	\$0
2014-2015	\$533,740,561	5.0	\$106,748,112	\$106,748,113	\$0	\$0	\$0	\$0
2015-2016	\$867,719,903	5.0	\$173,543,981	\$173,543,981	\$173,543,979	\$0	\$0	\$0
2016-2017	(\$696,422,278)	5.0	(\$139,284,456)	(\$139,284,456)	(\$139,284,456)	(\$139,284,454)	\$0	\$0
2017-2018	(\$243,331,952)	5.0	(\$48,666,390)	(\$48,666,390)	(\$48,666,390)	(\$48,666,390)	(\$48,666,392)	\$0
			(\$113,010,079)	\$92,341,248	(\$14,406,867)	(\$187,950,844)	(\$48,666,392)	\$0



**DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES ARISING FROM DIFFERENCES
BETWEEN EXPECTED AND ACTUAL INVESTMENT EARNINGS**

Year	Difference Between Projected and Actual Earnings on Pension Plan Investments (a)	Amounts Recognized in Pension Expense Through June 30, 2018 (b)	Amounts of Deferred Resources (Inflows)/Outflows (a) – (b)
2013-2014	(\$1,026,756,634)	(\$1,026,756,634)	\$0
2014-2015	\$533,740,561	\$426,992,448	\$106,748,113
2015-2016	\$867,719,903	\$520,631,943	\$347,087,960
2016-2017	(\$696,422,278)	(\$278,568,912)	(\$417,853,366)
2017-2018	(\$243,331,952)	(\$48,666,390)	(\$194,665,562)
		(\$406,367,545)	(\$158,682,855)



SCHEDULE OF CHANGES OF ASSUMPTION

Year	Assumption Changes	Recognition Period (Years)	Increase/(Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes					
			2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	Thereafter
2013-2014	\$0	4.96	\$0	\$0	\$0	\$0	\$0	\$0
2014-2015	\$0	4.13	\$0	\$0	\$0	\$0	\$0	\$0
2015-2016	\$668,216,579	3.72	\$179,628,113	\$129,332,240	\$0	\$0	\$0	\$0
2016-2017	\$0	3.76	\$0	\$0	\$0	\$0	\$0	\$0
2017-2018	\$0	2.53	\$0	\$0	\$0	\$0	\$0	\$0
			<u>\$179,628,113</u>	<u>\$129,332,240</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>



**DEFERRED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF
RESOURCES ARISING FROM CHANGES OF ASSUMPTION**

Year	Changes Due to Changes in Assumptions (Decreases) / Increases (a)	Amounts Recognized in Pension Expense Through June 30, 2018 (b)	Amounts of Deferred Resources (Inflows)/Outflows (a) – (b)
2013-2014	\$0	\$0	\$0
2014-2015	\$0	\$0	\$0
2015-2016	\$668,216,579	\$538,884,339	\$129,332,240
2016-2017	\$0	\$0	\$0
2017-2018	\$0	\$0	\$0
		\$538,884,339	\$129,332,240



SUMMARY OF RECOGNIZED OUTFLOWS OF RESOURCES AND DEFERRED INFLOWS OF RESOURCES

	Net Increase/(Decrease) in Pension Expense					
	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	Thereafter
Differences between Expected and Actual Experience	\$229,347,424	\$198,529,770	\$115,570,200	\$0	\$0	\$0
Changes of Assumptions	\$179,628,113	\$129,332,240	\$0	\$0	\$0	\$0
Differences between Projected and Actual Earnings on Pension Plan Investments	(\$113,010,079)	\$92,341,248	(\$14,406,867)	(\$187,950,844)	(\$48,666,392)	\$0
Grand Total	\$295,965,458	\$420,203,258	\$101,163,333	(\$187,950,844)	(\$48,666,392)	\$0