



**Cavanaugh Macdonald**  
CONSULTING, LLC

*The experience and dedication you deserve*



**Report on the Annual Basic Benefits Valuation of the  
School Employees Retirement System of Ohio**

**Prepared as of June 30, 2021**





# Cavanaugh Macdonald

CONSULTING, LLC

*The experience and dedication you deserve*

October 29, 2021

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

Dear Members of the Board:

Presented in this report are the results of the annual actuarial valuation of the basic benefits provided under the School Employees Retirement System of Ohio (SERS) as of June 30, 2021. The purpose of the valuation was to measure the System's funding progress and to calculate the actuarially determined employer contribution rates for the fiscal year beginning July 1, 2021.

The valuation is based upon data, furnished by the SERS staff, concerning active, inactive and retiree members along with pertinent financial information. The complete cooperation of the SERS staff in furnishing materials requested is hereby acknowledged with appreciation.

In order to prepare the results in this report we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information, but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments that we believe would be appropriate.

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.



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 opinion contained herein.

Respectfully submitted,

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

Todd B. Green, ASA, EA, FCA, MAAA  
President

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

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

TBG/JJG:bvb



## **TABLE OF CONTENTS**

| <b><u>Section</u></b>  | <b><u>Item</u></b>                             | <b><u>Page</u></b> |
|------------------------|--|--------------------|
|                        | Executive Summary                              | 1                  |
| I                      | Summary of Principal Results                   | 9                  |
| II                     | Membership Data                                | 11                 |
| III                    | Assets   | 13                 |
| IV                     | Comments on Valuation                          | 14                 |
| V                      | Derivation of Experience Gains and Losses      | 15                 |
| VI                     | Actuarially Determined Contribution Rates      | 18                 |
| VII                    | Schedule of Funding Progress                   | 19                 |
| VIII                   | Risk Considerations                            | 20                 |
| <br>                   |  |                    |
| <b><u>Schedule</u></b> |  |                    |
| A                      | Valuation Balance Sheet and Solvency Test      | 26                 |
| B                      | Development of Actuarial Value of Assets       | 28                 |
| C                      | Statement of Actuarial Assumptions and Methods | 29                 |
| D                      | Summary of Benefit and Contribution Provisions | 32                 |
| E                      | Detailed Tabulations of the Data               | 38                 |
| F                      | Gain/Loss Analysis Details                     | 49                 |
| G                      | Glossary                                       | 59                 |
| <br>                   |  |                    |
| <b><u>Appendix</u></b> |  |                    |
| A                      | Actuarial Accrued Liabilities                  | 60                 |
| B                      | Breakdown of Total and Accrued Liabilities     | 61                 |
| C                      | Comparative Schedule                           | 62                 |



**REPORT ON THE ANNUAL VALUATION OF THE  
SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO**

**PREPARED AS OF JUNE 30, 2021**

**EXECUTIVE SUMMARY**

The School Employees Retirement System of Ohio (SERS or System) is a defined benefit public pension fund that provides pensions and access to health care coverage for retired school employees who are covered in nonteaching positions. This includes bus drivers, custodians, treasurers, business officials, administrative assistants, food service providers, and educational aides. This report presents the results of the June 30, 2021, actuarial funding valuation of the System. The primary purposes of performing the actuarial funding valuation are to:

- determine the sufficiency of the Statutory Contribution Rate as set forth in the Ohio statutes;
- determine the experience of the System since the last valuation date;
- disclose asset and liability measures as of the valuation date; and
- analyze and report on trends in System contributions, assets, and liabilities over the past several years.

Since the previous valuation, there were no changes to the plan provisions, however the actuarial methods and assumptions were updated to reflect an experience study performed over the five-year period ending June 30, 2020. Any measures of experience gains and losses for the year ending June 30, 2021 are based the assumptions and methods in use for the June 30, 2020 valuation. The experience study reviewed the actuarial assumptions and methods used in the actuarial valuation process. The assumptions fall into two categories. The first includes economic assumptions which include price inflation, wage inflation and investment return. The second category includes demographic assumptions such as assumed rates of mortality, service retirement, disability retirement, withdrawal, and salary increases for merits and promotions.

| Summary of Assumptions Changes           |  |
|--|--|
| Economic Assumptions                     |  |
| <b>Salary</b>                            | Composed of Inflation component, Real Rate of Salary Increase component and Merit/Promotion Scale  |
| Inflation                                | Reduction to annual assumed rate of inflation assumption from 3.00% to 2.40%.  |
| Wage Inflation                           | Increase to annual assumed rate from real salary increase assumption from 0.50% to 0.85%   |
| <b>Investment Rate of Return</b>         | Composed of Inflation component (2.40% from above) and Real Rate of Return component equal to 4.60%. Reduction from 7.50% to 7.00% net investment return assumption. |
| <b>Payroll Growth</b>                    | Reduce from 3.50% to 1.75%.  |
| <b>Annual Cost-of-Living Adjustments</b> | Reduce from 2.50% to 2.00%.  |



| Summary of Assumptions Changes |   |
|--------------------------------|---|
| Demographic Assumptions        |   |
| <b>Withdrawal</b>              | Adjusted rates of withdrawal  |
| <b>Retirement</b>              | Adjusted rates of normal and early retirement   |
| <b>Disability</b>              | Adjusted rates of disability retirement   |
| <b>Base Mortality</b>          | <p><b>Healthy Retirees</b> – PUB-2010 General Employee Amount Weighted Below Median Healthy Retiree mortality table projected to 2017 with ages set forward 1 year and adjusted 94.20% for males and set forward 2 years and adjusted 81.35% for females.</p> <p><b>Disabled Retirees</b> – PUB-2010 General Disabled Retiree mortality table projected to 2017 with ages set forward 5 years and adjusted 103.3% for males and set forward 3 years and adjusted 106.8% for females.</p> <p><b>Contingent Survivors</b> - PUB-2010 General Amount Weighted Below Median Contingent Survivor mortality table projected to 2017 with ages set forward 1 year and adjusted 105.5% for males and adjusted 122.5% for females.</p> <p><b>Actives</b> – PUB-2010 General Amount Weighted Below Median Employee mortality table.</p> |
| <b>Mortality Projection</b>    | Mortality rates are projected using a fully generational projection with Scale MP-2020.   |

Since the previous valuation, the normal cost method has been updated to align the normal cost calculation with imputed compensation. Imputed salaries are estimated from the previous year’s salary by applying the salary scale to the reported compensation for the period ending June 30, 2021. The annual compensation as of June 30, 2021 shown throughout the report reflects imputed salaries.

The actuarial valuation results provide a “snapshot” view of the System’s financial condition on June 30, 2021. Actuarial gains and losses result when the actual experience of the plan (such as asset return, pay increases, turnover, deaths, etc.) is different from that expected by the actuarial assumptions. The System’s unfunded actuarial accrued liability (UAAL) was expected to be \$5,958.9 million as of June 30, 2021, taking into account contributions from the employers and members of \$830.6 million. The actual UAAL is \$5,498.1 million. The net decrease of \$460.8 million is attributable to liability and investment gains and losses which are detailed in Section V. The remaining amortization period of the UAAL is 23 years as of June 30, 2021.

The valuation is based on a set of actuarial assumptions which were adopted by the Board based on the five-year experience study for the period ending June 30, 2020. These assumptions are presented in Schedule C.



A summary of the key results from the June 30, 2021 actuarial valuation is shown below. Further detail on the valuation results can be found in the following sections of this Executive Summary.

|   | June 30, 2021<br>Valuation Results | June 30, 2020<br>Valuation Results |
|---|------------------------------------|------------------------------------|
| Actuarially Determined Contribution Rate      | 12.50%                             | 10.86%                             |
| Employer Contribution Rate                    | 14.00%                             | 14.00%                             |
| Sufficiency/(Deficiency)                      | 1.50%                              | 3.14%                              |
| Remaining Amortization Period                 | 23                                 | 24                                 |
| Unfunded Actuarial Accrued Liability (\$M)    | \$5,498.1                          | \$5,997.1                          |
| Basic Benefit Funded Ratio (Actuarial Assets) | 74.46%                             | 71.49%                             |

The funded ratio of the basic benefits is 74.46%. Since this is greater than 70%, per the Board-adopted funding policy, the basic benefits may receive an employer contribution between 13.50% and 14.00% of compensation for FY2022. The Health Care Fund may receive an employer contribution of up to 0.50%. Based on a Board Resolution dated October 21, 2021, the valuation assumes an allocation of the entire 14.00% to the basic benefits and 0.00% allocated to health care consistent with SERS' funding policy. The funding policy requires at least 13.50% of the employers' contributions be allocated to SERS' basic benefits when the funded ratio is 70% but less than 80%, with the remainder (if any) allocated to health care.

#### **EXPERIENCE FOR THE LAST PLAN YEAR**

Numerous factors contributed to the change in the System's assets, liabilities, and actuarial contribution rate between June 30, 2020 and June 30, 2021. The components are examined in the following discussion.

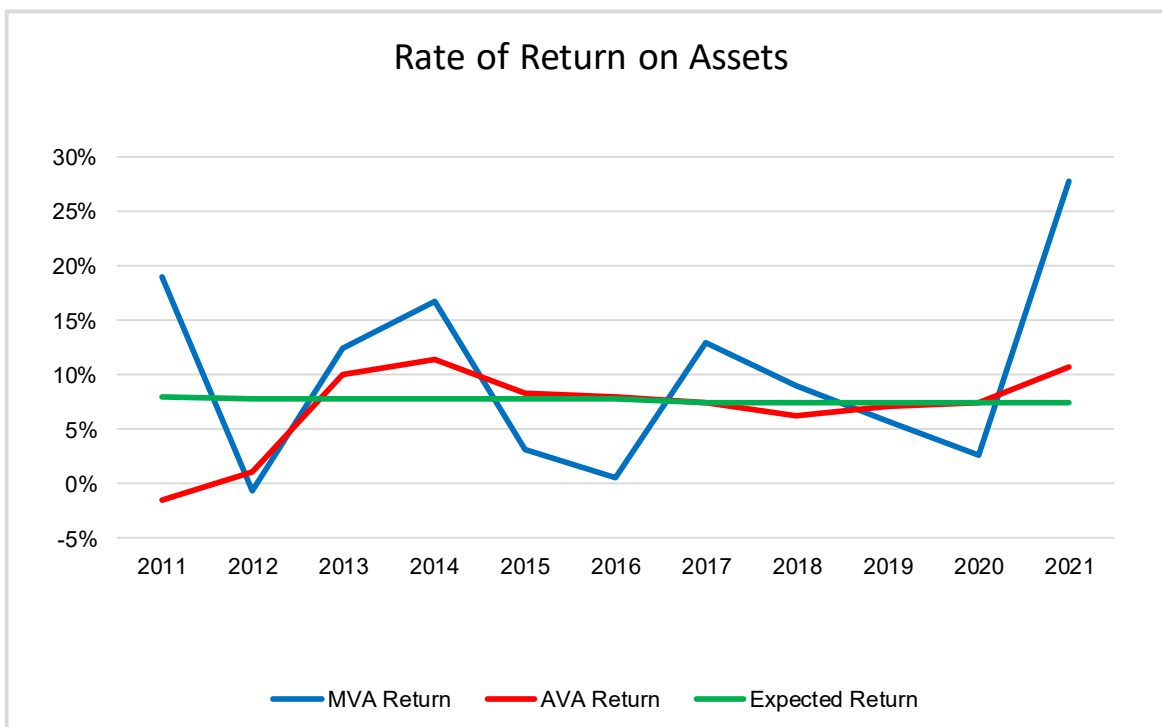
#### **ASSETS**

As of June 30, 2021, SERS' basic benefits had net assets of \$17,840,046,988, when measured on a market value basis. This was an increase of \$3,420,448,361 from the previous year. The market value of assets is not used directly in the calculation of the unfunded actuarial accrued liability and the actuarially determined contribution. The asset valuation smoothing method, which recognizes the annual unexpected portion of market value investment returns over a four-year period, attempts to reduce the effect of market volatility. The resulting amount is called the "actuarial value of assets" and is utilized to determine the actuarial valuation results. In this year's valuation, the actuarial value of assets as of June 30, 2021, was \$16,031,612,792, an increase of \$994,877,642 from the value in the prior year. The components of change in the asset values are shown in the table below.

|                                     | Actuarial Value   | Market Value      |
|-------------------------------------|-------------------|-------------------|
| Net Assets, June 30, 2020           | \$ 15,036,735,150 | \$ 14,419,598,627 |
| - Employer and Member Contributions | + 830,633,505     | + 830,633,505     |
| - Benefit Payments                  | - 1,374,410,677   | - 1,374,410,677   |
| - Investment Gains                  | + 1,538,654,814   | + 3,964,225,533   |
| Net Assets, June 30, 2021           | 16,031,612,792    | 17,840,046,988    |



The estimated investment return on the market value of assets for FY2021 was 27.83%. Due to the investment experience gain for FY 2021, the resulting return on the smoothed actuarial value of assets was 10.80%. The return on the funds supporting Basic Benefits was 10.42%. As this rate of return was greater than the assumed rate of 7.50%, there was an actuarial investment experience gain of \$431.3 million. The return on the Health Care Fund is 22.23%. Please see Section III, Schedule B, and Schedule F of this report for more detailed information on the market and actuarial value of assets.



Market value returns have been very volatile. As can be seen in this graph, the return on actuarial assets is much smoother than the return on market value. The asset smoothing method impacts only the timing of when the actual market experience is recognized in the valuation process. The remaining deferred investment experience net gain of \$1,808 million will be absorbed in future years.

## LIABILITIES

The actuarial accrued liability is the portion of the present value of future benefits allocated to service performed up to the valuation date. The difference between this liability and the actuarial value of assets is called the unfunded actuarial accrued liability (UAAL). The dollar amount of unfunded actuarial accrued liability is reduced if the contributions to the System exceed the normal cost for the year, plus interest on the prior year's UAAL.





The unfunded actuarial accrued liability is shown as of June 30, 2021 in the following table:

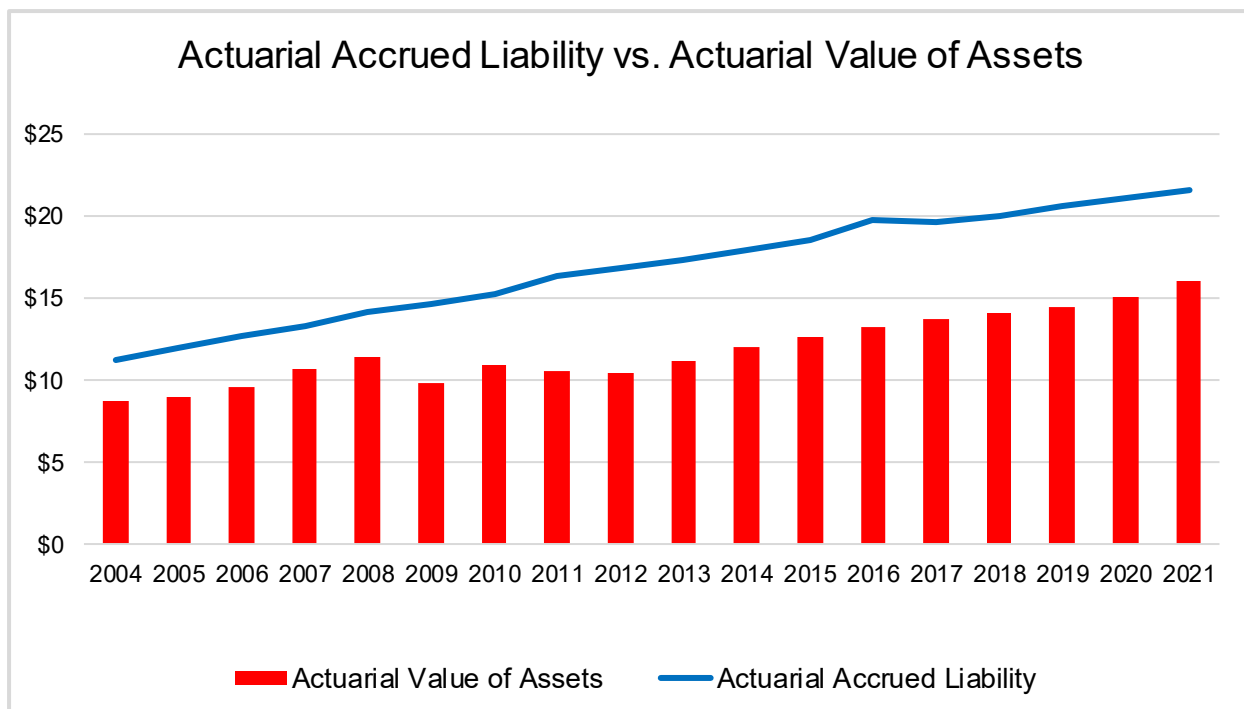
|                                       | Actuarial<br>Value of Assets | Market<br>Value of Assets |
|---------------------------------------|------------------------------|---------------------------|
| Actuarial Accrued Liability           | \$21,529,757,004             | \$21,529,757,004          |
| Value of Assets                       | \$16,031,612,792             | \$17,840,046,988          |
| Unfunded Actuarial Accrued Liability* | \$5,498,144,212              | \$3,689,710,016           |
| Funded Ratio                          | 74.46%                       | 82.86%                    |

\* See Appendix B of the report for the detailed development of the unfunded actuarial accrued liability.

Changes in the UAAL occur for various reasons. The net decrease in the UAAL from June 30, 2020, to June 30, 2021, was \$498,929,957. The components of this net change are shown in the table below:

|  |           |           |
|--|-----------|-----------|
| <b>Unfunded Actuarial Accrued Liability, June 30, 2020</b> |           |           |
| <b>(\$ Millions)</b>                                       |           | \$5,997.1 |
| Expected increase due to amortization method               | (\$38.5)  |           |
| Investment experience                                      | (\$431.3) |           |
| Liability experience                                       | (\$155.8) |           |
| Assumption Changes   | \$126.6   |           |
| Total  |           | (\$499.0) |
| <b>Unfunded Actuarial Accrued Liability, June 30, 2021</b> |           | \$5,498.1 |

As shown above, various components impacted the UAAL. Actuarial gains (losses) result from actual experience that is more (less) favorable than anticipated based on the actuarial assumptions. The amounts are measured as the difference between the expected unfunded actuarial accrued liability and the actual unfunded actuarial accrued liability net of any impact due to changes in actuarial assumptions and methods or benefit provisions. Overall, the System experienced a net decrease to the UAAL of \$499.0 million. The net UAAL decrease is comprised primarily of experience and investment gains; the largest sources of liability losses were retirement and termination experience, which were offset by a salary experience and investment experience gains.

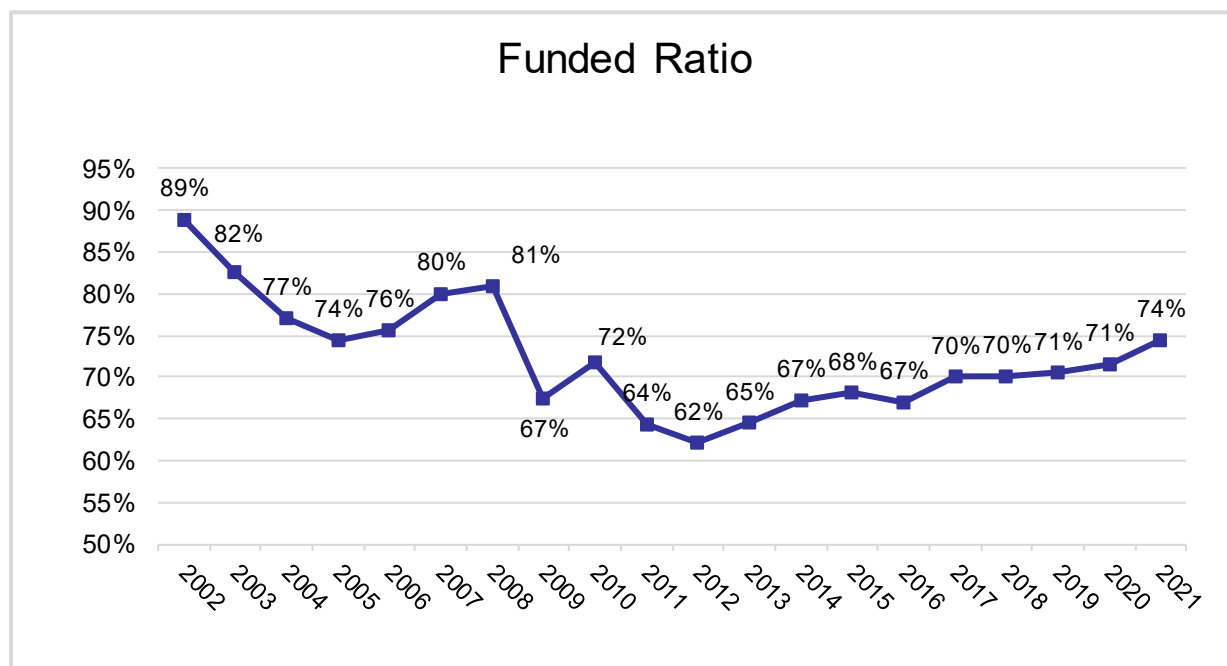


Since June 30, 2004, the actuarial accrued liability has been higher than the actuarial value of assets. Investment experience below the assumed rate of return was the primary source of the increased difference between the actuarial accrued liability and actuarial assets. SERS implemented pension reform to improve the System’s funding progress. In addition, the Board adopted a new funding policy that will allocate a higher portion of the employer contribution toward the basic benefits until the fund achieves a funded status of 90%. An evaluation of the unfunded actuarial accrued liability on a pure dollar basis may not provide a complete analysis since only the difference between the assets and liabilities (which are both very large numbers) is reflected. Another way to evaluate the unfunded actuarial accrued liability and the progress made in its funding is to track the funded ratio, the ratio of the actuarial value of assets to the actuarial accrued liability.

|  | 6/30/17    | 6/30/18    | 6/30/19    | 6/30/20    | 6/30/21   |
|--|------------|------------|------------|------------|-----------|
| Funded Ratio                               | 70.01%     | 70.07%     | 70.51%     | 71.49%     | 74.46%    |
| Unfunded Actuarial Accrued Liability (\$M) | \$ 5,875.3 | \$ 5,985.5 | \$ 6,054.2 | \$ 5,997.1 | \$5,498.1 |



The longer-term historical funded ratio information is shown in the chart below.



Investment returns are the primary source of decreases in the funded ratio as can be seen during the 2002-2003 “tech bubble” recession and the “great” recession of 2008-2009. Board actions which led to legislation to modify the Plan in combination with improved experience of the System are attributable to the improved funded ratio since 2016.

### CONTRIBUTION RATE

Under the Entry Age Normal cost method, the actuarial contribution rate consists of two components:

- a "normal cost" for the portion of projected liabilities allocated by the actuarial cost method to service of members during the year following the valuation date which is funded by both member and employer contributions, and
- an "unfunded actuarial accrued liability contribution" for the excess of the portion of projected liabilities allocated to service-to-date over the actuarial value of assets.



See Section VI of the report for the detailed development of these contribution rates which are summarized in the following table:

| <b>Contribution Rates</b>                                    | <b>June 30, 2021</b> | <b>June 30, 2020</b> |
|--|----------------------|----------------------|
| 1. Employer Portion of Normal Cost Rate                      | 1.26%                | 0.06%                |
| 2. UAAL Contribution Rate                                    | 11.24%               | 10.80%               |
| 3. Total Actuarial Determined Contribution Rate<br>(1) + (2) | 12.50%               | 10.86%               |
| 4. Funded Ratio  | 74.46%               | 71.49%               |
| 5. Total Employer Contribution Rate                          | 14.00%               | 14.00%               |
| 6. Amount Allocated to Basic Benefits                        | 14.00%               | 14.00%               |

As discussed earlier, SERS' basic benefits includes retirement, disability and survivor benefits, along with Medicare Part B reimbursements and lump sum retiree death benefits. SERS also provides access to health care coverage for retiree members. The Health Care Fund is partially supported by employer contributions that are not required for actuarially funding basic benefits. The funding policy is expected to accelerate the pace at which SERS' basic benefits will achieve a funded ratio equal to 90%.



**REPORT ON THE ANNUAL VALUATION OF THE  
SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO**

**PREPARED AS OF JUNE 30, 2021**

**SECTION I – SUMMARY OF PRINCIPAL RESULTS**

1. This report, prepared as of June 30, 2021, presents the results of the annual actuarial valuation of the basic benefits provided under the System, including pension, Medicare Part B reimbursement and post-retirement death benefits. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized in the following table.

**SUMMARY OF PRINCIPAL RESULTS**

|   | June 30, 2021    | June 30, 2020    |
|---|------------------|------------------|
| <b>Active members included in valuation</b>     |                  |                  |
| Number  | 146,646          | 156,579          |
| Annual Compensation*                            | \$3,622,097,199  | \$3,477,578,726  |
| <b>Retirees</b>                                 |                  |                  |
| Number  | 80,721           | 80,851           |
| Annual allowances                               | \$1,254,934,762  | \$1,234,342,326  |
| <b>Deferred Vesteds</b>                         |                  |                  |
| Number  | 5,972            | 5,654            |
| Annual deferred allowances                      | \$38,777,532     | \$37,104,572     |
| <b>Assets (net of Health Care Assets)</b>       |                  |                  |
| Market related actuarial value                  | \$16,031,612,792 | \$15,036,735,150 |
| Market value                                    | \$17,840,046,988 | \$14,419,598,627 |
| <b>Unfunded Accrued Liability</b>               | \$5,498,144,212  | \$5,997,074,169  |
| <b>Funded Ratio (AVA/AAL)</b>                   |                  |                  |
| All Basic Benefits                              | 74.46%           | 71.49%           |
| Pension Benefits                                | 74.80%           | 71.90%           |
| Medicare Part B                                 | 56.94%           | 50.66%           |
| Post-retirement Death Benefits                  | 67.71%           | 66.81%           |
| <b>Actuarially Determined Contribution Rate</b> |                  |                  |
| Normal  | 1.26%            | 0.06%            |
| Accrued liability                               | 11.24%           | 10.80%           |
| Total   | 12.50%           | 10.86%           |
| <b>Funding Policy Contribution Rate</b>         | 14.00%           | 14.00%           |
| Accrued liability amortization period (years)   | 23               | 24               |

\* The annual compensation as of June 30, 2021 reflect imputed salaries.



2. The statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. Employer contributions in excess of those required to support the basic benefits may be allocated to retiree health care funding. 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.
3. The valuation balance sheet showing the results of the valuation is given in Schedule A.
4. Comments on the valuation results are given in Section IV, comments on the experience and the sources of actuarial gains and losses during the valuation year are given in Section V, and the rates of contribution payable by employers are given in Section VI.
5. Schedule B of this report presents the development of the actuarial value of assets. Schedule C details the actuarial assumptions and methods employed. Schedule D gives a summary of the benefit and contribution provisions of the plan.



## SECTION II – MEMBERSHIP DATA

Data regarding the membership of the System for use as a basis for the valuation were furnished by the System’s staff. The following tables summarize the membership of the system as of June 30, 2021, upon which the valuation was based. Detailed tabulations of the data are given in Schedule E.

### **Active Members**

| Number  | Payroll         | Group Averages |      |         |
|---------|-----------------|----------------|------|---------|
|         |                 | Salary         | Age  | Service |
| 146,646 | \$3,622,097,199 | \$24,700       | 47.7 | 8.1     |

The total number of active members includes 44,997 vested members and 101,649 non-vested members. Those who reached 25 years of service on or before August 1, 2017 were eligible to retire under the previous age and service credit eligibility requirements.

The following table shows a six-year schedule of active member valuation data.

### **SCHEDULE OF SERS ACTIVE MEMBER VALUATION DATA**

| Valuation Date | Number   | Annual Payroll   | Annual Average Pay | % Increase in Average Pay |
|----------------|----------|------------------|--------------------|---------------------------|
| 6/30/2016      | 124,540  | \$2,932,236,551  | \$23,545           | 1.7%                      |
| 6/30/2017      | 157,981* | 3,302,805,662    | 20,906             | (11.2)                    |
| 6/30/2018      | 158,343  | 3,332,395,171    | 21,045             | 0.7                       |
| 6/30/2019      | 159,363  | 3,462,524,396    | 21,727             | 3.2                       |
| 6/30/2020      | 156,579  | 3,477,578,726    | 22,210             | 2.2                       |
| 6/30/2021      | 146,646  | 3,622,097,199 ** | 24,700             | 11.2                      |

\* Effective in FY2017, the active member headcount reflects an increase of members who have been re-categorized from inactive to active status.

\*\* The annual compensation as of June 30, 2021 reflect imputed salaries.



The following table shows the number and annual retirement allowances payable to retiree members and their beneficiaries on the roll of the Retirement System as of the valuation date as well as certain group averages.

### Retiree Lives

| Type of Benefit Payment    | Number | Annual Benefits | Group Averages |      |
|----------------------------|--------|-----------------|----------------|------|
|                            |        |                 | Benefit        | Age  |
| Retirees and Beneficiaries | 71,657 | \$1,127,708,289 | \$15,738       | 75.0 |
| Disability                 | 4,868  | 87,390,489      | 17,952         | 66.7 |
| Survivors                  | 4,196  | 39,835,984      | 9,494          | 72.6 |
| Total in SERS              | 80,721 | \$1,254,934,762 | \$15,547       | 74.4 |

This valuation also includes 278,659 inactive members eligible for a contribution refund only (including 254,797 members reported separately who had completed one or more years of service before terminating). Their contributions totaled \$236,084,753 as of June 30, 2021. There were also 5,972 terminated vested members with annual deferred pension benefits of \$38,777,532. Included in the "Retiree" numbers in the above table are 12,203 reemployed retirees with account balances of \$122,724,317 (including employer contributions and interest), 799 reemployed retirees receiving only an annuity from their contributions and their employers' matching contributions, and 912 reemployed retirees receiving such annuities in addition to their regular pension benefits. The sum of the annuity payments attributable to these reemployed retirees is \$7,568,723.





### SECTION III – ASSETS

1. As of June 30, 2021, the total market value of assets amounted to \$18,440,377,176. All figures include the combined Pension Trust Fund, Medicare B Fund, Death Benefit Fund, and Health Care Fund, but exclude the QEBA Fund. The return on the combined funds including the Health Care Fund is 27.83%. The return on the funds supporting Basic Benefits is 28.02%. The return on the Health Care Fund is 22.23%.

| Asset Summary Based on Market Value |  |    |                 |
|-------------------------------------|--|----|-----------------|
| (1)                                 | Assets at June 30, 2020                          | \$ | 14,902,210,105  |
| (2)                                 | Contributions and Misc. Revenue                  |    | 968,216,942     |
| (3)                                 | Investment Gain (Loss)                           |    | 4,072,493,787   |
| (4)                                 | Benefit Payments                                 |    | (1,502,543,658) |
| (5)                                 | Assets at June 30, 2021<br>(1) + (2) + (3) + (4) | \$ | 18,440,377,176  |
| (6)                                 | Annualized Rate of Return*                       |    | 27.83 %         |

2. The four-year smoothed market related actuarial value of assets used for the current valuation was \$16,631,942,980. Schedule B shows the development of the actuarial value of assets as of June 30, 2021. Again all figures include the combined Pension Trust Fund, Medicare B Fund, Death Benefit Fund, and Health Care Fund, but exclude the QEBA Fund. The return on the combined funds including the Health Care Fund is 10.80%. The return on the funds supporting Basic Benefits is 10.42%. The return on the Health Care Fund is 22.23%.

| Asset Summary Based on Actuarial Value |   |    |                 |
|--|---|----|-----------------|
| (1)                                    | Assets at June 30, 2020   | \$ | 15,519,346,628  |
| (2)                                    | Contributions and Misc. Revenue   |    | 968,216,942     |
| (3)                                    | Investment Gain (Loss)  |    | 1,646,923,068   |
| (4)                                    | Benefit Payments  |    | (1,502,543,658) |
| (5)                                    | Assets at June 30, 2021 Before Application of Corridor<br>(1) + (2) + (3) + (4) | \$ | 16,631,942,980  |
| (6)                                    | Annualized Rate of Return*  |    | 10.80 %         |

\*Based on the approximation formula:  $I / [0.5 \times (A + B - I)]$ , where

- I = Investment Gain (Loss)
- A = Beginning of year asset value
- B = End of year asset value



#### **SECTION IV - COMMENTS ON VALUATION**

Schedule A of this report contains the valuation balance sheet which shows the present and prospective assets and liabilities of the System as of June 30, 2021.

1. The total retirement benefit valuation balance sheet shows that the System has total future retirement benefit liabilities of \$25,063,688,730, of which \$12,985,430,420 is for the future benefits payable for present retiree members and beneficiaries of deceased members; \$718,974,558 is for the future benefits payable for present inactive members; and \$11,359,283,752 is for the future benefits payable for present active members. Against these retirement benefit liabilities the System has a total present actuarial value of assets of \$16,031,612,792 as of June 30, 2021. The difference of \$9,032,075,938 between the total liabilities and the total present actuarial value of assets represents the present value of contributions to be made in the future for retirement benefits. Of this amount, \$3,207,536,291 is the present value of future contributions expected to be made by members, and the balance of \$5,824,539,647 represents the present value of future contributions payable by the employers.
2. The employers' contributions to the System on account of retirement benefits consist of normal contributions, accrued liability contributions and contributions for administrative expenses. The valuation indicates that employer normal contributions at the rate of 0.95% of payroll for basic pension benefits, 0.02% of payroll for post-retirement death benefits, and 0.29% of payroll for Medicare Part B benefits are required to provide the benefits of the System for the average member of SERS. Prospective employer normal contributions on account of retirement benefits at the above rates have a present value of \$326,395,435.
3. For pension benefits, it is recommended that the unfunded accrued liability contribution rate payable by the employers on account of retirement benefits be set at 10.87% of payroll. For post-retirement death benefits, it is recommended that the unfunded accrued liability contribution rate payable by the employers on account of retirement benefits be set at 0.03% of payroll. Finally, for Medicare Part B benefits, it is recommended that the unfunded accrued liability contribution rate payable by the employers on account of retirement benefits be set at 0.34% of payroll. These rates are sufficient to amortize the unfunded accrued liability of \$5,498,144,212 over 23 years based on the assumption that the aggregate payroll for SERS members will increase by 1.75% each year.
4. The present value of the total future contributions to be made by the employers for basic benefits is the sum of the future employer normal contributions and the unfunded accrued liability contributions and equals \$5,824,539,647.



## SECTION V – DERIVATION OF EXPERIENCE GAINS AND LOSSES

Actual experience will never (except by coincidence) match exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) for the year ended June 30, 2021, is shown below in \$ millions.

### Experience (Gain/Loss)

| Total Basic Benefits<br>June 30: |  | 2021       | 2020    | 2019    | 2018    | 2017    | 2016    |
|----------------------------------|--|------------|---------|---------|---------|---------|---------|
| (1)                              | UAAL from last valuation                               | \$ 5,997.1 | 6,054.2 | 5,985.5 | 5,875.3 | 6,591.1 | 5,901.6 |
| (2)                              | Normal cost from last valuation                        | 347.6      | 344.1   | 330.6   | 342.4   | 312.5   | 319.3   |
| (3)                              | Contributions  | 830.6      | 843.9   | 809.9   | 759.9   | 804.4   | 750.7   |
| (4)                              | Interest accrual:<br>[(1) + (2) - (3)*.5] x .075       | 444.8      | 448.3   | 443.3   | 437.8   | 487.6   | 453.0   |
| (5)                              | Expected UAAL before changes:<br>(1) + (2) - (3) + (4) | \$ 5,958.9 | 6,002.7 | 5,949.5 | 5,895.6 | 6,586.8 | 5,923.2 |
| (6)                              | Change due to plan amendments                          | 0.0        | 0.0     | 0.0     | 357.6   | 998.5   | 0.0     |
| (7)                              | Change due to new actuarial<br>assumption or methods   | (126.5)    | 0.0     | 0.0     | 0.0     | 0.0     | (668.2) |
| (8)                              | Expected UAAL after changes:<br>(5) - (6) - (7)        | \$ 6,085.4 | 6,002.7 | 5,949.5 | 5,538.0 | 5,588.3 | 6,591.4 |
| (9)                              | Actual UAAL from this valuation                        | \$ 5,498.1 | 5,997.1 | 6,054.2 | 5,985.5 | 5,875.3 | 6,591.1 |
| (10)                             | Total Gain/(Loss): (8) - (9)                           | \$ 587.3   | 5.6     | (104.7) | (447.4) | (287.0) | 0.3     |
| (11)                             | Investment Gain/(Loss):                                | \$ 431.3   | 7.1     | (44.1)  | (161.1) | (12.2)  | 50.6    |
| (12)                             | Non-Investment Gain/(Loss)                             | \$ 155.8   | (1.5)   | (60.6)  | (286.3) | (274.8) | (50.3)  |

| Pension<br>June 30: |  | 2021       | 2020    | 2019    | 2018    | 2017    | 2016    |
|---------------------|--|------------|---------|---------|---------|---------|---------|
| (1)                 | UAAL from last valuation                               | \$ 5,789.8 | 5,822.7 | 5,735.1 | 5,611.3 | 6,315.7 | 5,640.9 |
| (2)                 | Normal cost from last valuation                        | 338.8      | 335.4   | 322.1   | 334.1   | 305.6   | 313.3   |
| (3)                 | Contributions  | 803.0      | 814.0   | 780.6   | 731.8   | 778.7   | 727.0   |
| (4)                 | Interest accrual:<br>[(1) + (2) - (3)*.5] x .075       | 429.6      | 431.4   | 425.0   | 418.5   | 467.4   | 433.3   |
| (5)                 | Expected UAAL before changes:<br>(1) + (2) - (3) + (4) | \$ 5,755.2 | 5,775.5 | 5,701.6 | 5,632.1 | 6,310.0 | 5,660.5 |
| (6)                 | Change due to plan amendments                          | 0.0        | 0.0     | 0.0     | 357.6   | 998.5   | 0.0     |
| (7)                 | Change due to new actuarial<br>assumption or methods   | (120.9)    | 0.0     | 0.0     | 0.0     | 0.0     | (643.5) |
| (8)                 | Expected UAAL after changes:<br>(5) - (6) - (7)        | \$ 5,876.1 | 5,775.5 | 5,701.6 | 5,274.5 | 5,311.5 | 6,304.0 |
| (9)                 | Actual UAAL from this valuation                        | \$ 5,316.4 | 5,789.8 | 5,822.7 | 5,735.1 | 5,611.3 | 6,315.7 |
| (10)                | Total Gain/(Loss): (8) - (9)                           | \$ 559.7   | (14.3)  | (121.1) | (460.6) | (299.8) | (11.7)  |
| (11)                | Investment Gain/(Loss):                                | \$ 425.4   | 6.4     | (44.1)  | (159.0) | (12.3)  | 49.6    |
| (12)                | Non-Investment Gain/(Loss)                             | \$ 134.3   | (20.7)  | (77.0)  | (301.6) | (287.5) | (61.3)  |



**SECTION V – DERIVATION OF EXPERIENCE GAINS AND LOSSES**  
(\$ Millions)

| Medicare Part B<br>June 30: |  | 2021     | 2020  | 2019  | 2018  | 2017  | 2016   |
|-----------------------------|--|----------|-------|-------|-------|-------|--------|
| (1)                         | UAAL from last valuation                               | \$ 194.0 | 217.4 | 235.4 | 249.1 | 259.7 | 246.9  |
| (2)                         | Normal cost from last valuation                        | 8.3      | 8.2   | 8.0   | 7.8   | 6.4   | 5.5    |
| (3)                         | Contributions  | 26.3     | 28.3  | 27.3  | 26.3  | 24.1  | 22.2   |
| (4)                         | Interest accrual:<br>[(1) + (2) - (3)*.5] x .075       | 14.1     | 15.8  | 17.2  | 18.3  | 19.0  | 18.7   |
| (5)                         | Expected UAAL before changes:<br>(1) + (2) - (3) + (4) | \$ 190.1 | 213.1 | 233.3 | 248.9 | 261.0 | 248.9  |
| (6)                         | Change due to plan amendments                          | 0.0      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    |
| (7)                         | Change due to new actuarial<br>assumption or methods   | (4.5)    | 0.0   | 0.0   | 0.0   | 0.0   | (22.4) |
| (8)                         | Expected UAAL after changes:<br>(5) - (6) - (7)        | \$ 194.6 | 213.1 | 233.3 | 248.9 | 261.0 | 271.3  |
| (9)                         | Actual UAAL from this valuation                        | \$ 168.5 | 194.0 | 217.4 | 235.4 | 249.1 | 259.7  |
| (10)                        | Total Gain/(Loss): (8) - (9)                           | \$ 26.1  | 19.1  | 15.9  | 13.5  | 11.9  | 11.6   |
| (11)                        | Investment Gain/(Loss):                                | \$ 5.2   | 0.7   | 0.1   | (1.9) | 0.1   | 0.9    |
| (12)                        | Non-Investment Gain/(Loss)                             | \$ 20.9  | 18.4  | 15.8  | 15.4  | 11.8  | 10.7   |

| Post-Retirement Death Benefits<br>June 30: |  | 2021    | 2020 | 2019  | 2018  | 2017 | 2016  |
|--|--|---------|------|-------|-------|------|-------|
| (1)  | UAAL from last valuation                               | \$ 13.3 | 14.1 | 15.0  | 14.9  | 15.7 | 13.8  |
| (2)  | Normal cost from last valuation                        | 0.5     | 0.5  | 0.5   | 0.5   | 0.5  | 0.5   |
| (3)  | Contributions  | 1.4     | 1.5  | 2.0   | 1.8   | 1.6  | 1.5   |
| (4)  | Interest accrual:<br>[(1) + (2) - (3)*.5] x .075       | 1.0     | 1.0  | 1.1   | 1.1   | 1.2  | 1.0   |
| (5)  | Expected UAAL before changes:<br>(1) + (2) - (3) + (4) | \$ 13.4 | 14.1 | 14.6  | 14.7  | 15.8 | 13.8  |
| (6)  | Change due to plan amendments                          | 0.0     | 0.0  | 0.0   | 0.0   | 0.0  | 0.0   |
| (7)  | Change due to new actuarial<br>assumption or methods   | (1.1)   | 0.0  | 0.0   | 0.0   | 0.0  | (2.3) |
| (8)  | Expected UAAL after changes:<br>(5) - (6) - (7)        | \$ 14.5 | 14.1 | 14.6  | 14.7  | 15.8 | 16.1  |
| (9)  | Actual UAAL from this valuation                        | \$ 13.2 | 13.3 | 14.1  | 15.0  | 14.9 | 15.7  |
| (10)                                       | Total Gain/(Loss): (8) - (9)                           | \$ 1.3  | 0.8  | 0.5   | (0.3) | 0.9  | 0.4   |
| (11)                                       | Investment Gain/(Loss):                                | \$ 0.7  | 0.0  | (0.1) | (0.2) | 0.0  | 0.1   |
| (12)                                       | Non-Investment Gain/(Loss)                             | \$ 0.6  | 0.8  | 0.6   | (0.1) | 0.9  | 0.3   |



## ANALYSIS OF FINANCIAL EXPERIENCE

### Gains and (Losses) in Accrued Liabilities Resulting from Difference Between Assumed Experience and Actual Experience (\$ Millions)

| Type of Activity  | Pension   | Medicare<br>Part B | Post-<br>Retirement<br>Death Benefit | Total Basic<br>Benefits |
|---|-----------|--------------------|--------------------------------------|-------------------------|
| <b>Age &amp; Service Retirements.</b> If members retire at older ages, there is a gain. If younger ages, a loss.                                    | \$ (99.9) | \$ 2.9             | \$ 0.8                               | \$ (96.2)               |
| <b>Disability Retirements.</b> If disability claims are less than assumed, there is a gain. If more claims, a loss.                                 | (5.0)     | 0.0                | 0.0                                  | (5.0)                   |
| <b>Pre-Retirement Death Benefits.</b> If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.                   | (4.5)     | (0.2)              | 0.0                                  | (4.7)                   |
| <b>Withdrawal From Employment.</b> If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.      | (108.7)   | 1.1                | 0.1                                  | (107.5)                 |
| <b>Pay Increases.</b> If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.                               | 136.7     | 0.0                | 0.0                                  | 136.7                   |
| <b>New Members.</b> Additional accrued liability attributable to members who entered the plan since the last valuation.                             | (16.0)    | (0.6)              | 0.0                                  | (16.6)                  |
| <b>Investment Income.</b> If there is a greater investment income than assumed, there is a gain. If less income, a loss.                            | 425.4     | 5.2                | 0.7                                  | 431.3                   |
| <b>Death After Retirement.</b> If retired members live longer than assumed, there is a loss. If not as long, a gain.                                | 45.3      | 15.0               | (0.5)                                | 59.8                    |
| <b>Other.</b> Miscellaneous gains and losses resulting from changes in valuation software, data adjustments, timing of financial transactions, etc. | 186.4     | 2.7                | 0.2                                  | 189.3                   |
| <b>Gain (or Loss) During Year From Financial Experience</b>   | \$ 559.7  | \$ 26.1            | \$ 1.3                               | \$ 587.1                |
| <b>Non-Recurring Items.</b> Adjustments for plan amendments, assumption changes and method changes  | (120.9)   | (4.5)              | (1.1)                                | (126.6)                 |
| <b>Composite Gain (or Loss) During Year</b>   | \$ 438.8  | \$ 21.6            | \$ 0.2                               | \$ 460.5                |



## SECTION VI – ACTUARIALLY DETERMINED CONTRIBUTION RATES

The valuation balance sheet gives the basis for determining the percentage rates for contributions to be made by employers to the Retirement System. The following table shows the rates of contribution payable by employers.

### Actuarially Determined Contribution Rates

| Contribution for                                      | Pension | Post-Retirement<br>Death Benefit | Medicare<br>Part B | Total<br>Basic Benefits |
|---|---------|----------------------------------|--------------------|-------------------------|
| A. Normal Cost:                                       |         |                                  |                    |                         |
| (1) Service retirement benefits                       | 7.42%   |                                  |                    |                         |
| (2) Disability benefits                               | 0.91    |                                  |                    |                         |
| (3) Survivor benefits                                 | 0.36    |                                  |                    |                         |
| (4) Refunds   | 2.26    |                                  |                    |                         |
| (5) Total   | 10.95%  |                                  |                    |                         |
| B. Member Contributions                               | 10.00%  | 0.02%                            | 0.29%              | 11.26%                  |
| C. Employer Normal Cost: [A(5) - B]                   | 0.95%   | 0.02%                            | 0.29%              | 1.26%                   |
| D. Unfunded Actuarial Accrued Liability Contributions | 10.87%  | 0.03%                            | 0.34%              | 11.24%                  |
| E. Total Recommended Employer Contribution Rate:[C+D] | 11.82%  | 0.05%                            | 0.63%              | 12.50%                  |

The statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. Employer contributions in excess of those required to support the basic benefits may be allocated to retiree health care funding. If the funded ratio is less than 70%, all 14% of the 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. Based on a Board Resolution dated October 21, 2021, the entire 14% of the employers' contribution will be allocated to SERS' basic benefits.



**SECTION VII – SCHEDULE OF FUNDING PROGRESS**  
(\$ Millions)

| Actuarial Valuation Date              | Value of Plan Assets (a) | Actuarial Liability (AAL) Entry Age (b) | Unfunded AAL (UAAL) (b - a) | Funded Ratio (a / b) | Covered Payroll (c) | UAAL as a Percentage of Covered Payroll (b - a) / (c) |
|---------------------------------------|--------------------------|---|-----------------------------|----------------------|---------------------|---|
| <b>Pension Benefits</b>               |                          |   |                             |                      |                     |   |
| 6/30/2016                             | \$ 13,015                | \$ 19,331                               | \$ 6,316                    | 67.3%                | \$ 2,932            | 215.4%  |
| 6/30/2017                             | 13,537                   | 19,148                                  | 5,611                       | 70.7                 | 3,303               | 169.9   |
| 6/30/2018                             | 13,824                   | 19,559                                  | 5,735                       | 70.7                 | 3,332               | 172.1   |
| 6/30/2019                             | 14,267                   | 20,090                                  | 5,823                       | 71.0                 | 3,463               | 168.1   |
| 6/30/2020                             | 14,811                   | 20,601                                  | 5,790                       | 71.9                 | 3,478               | 166.5   |
| 6/30/2021                             | 15,781                   | 21,097                                  | 5,316                       | 74.8                 | 3,622               | 146.8   |
| <b>Medicare Part B</b>                |                          |   |                             |                      |                     |   |
| 6/30/2016                             | \$ 142                   | \$ 402                                  | \$ 260                      | 35.4%                | \$ 2,932            | 8.9%  |
| 6/30/2017                             | 153                      | 402                                     | 249                         | 38.0                 | 3,303               | 7.5   |
| 6/30/2018                             | 164                      | 400                                     | 236                         | 41.1                 | 3,332               | 7.1   |
| 6/30/2019                             | 180                      | 397                                     | 217                         | 45.3                 | 3,463               | 6.3   |
| 6/30/2020                             | 199                      | 393                                     | 194                         | 50.6                 | 3,478               | 5.6   |
| 6/30/2021                             | 223                      | 391                                     | 169                         | 57.0                 | 3,622               | 4.6   |
| <b>Post-Retirement Death Benefits</b> |                          |   |                             |                      |                     |   |
| 6/30/2016                             | \$ 22                    | \$ 38                                   | \$ 16                       | 57.9%                | \$ 2,932            | 0.5%  |
| 6/30/2017                             | 23                       | 38                                      | 15                          | 60.5                 | 3,303               | 0.5   |
| 6/30/2018                             | 24                       | 39                                      | 15                          | 61.5                 | 3,332               | 0.5   |
| 6/30/2019                             | 26                       | 40                                      | 14                          | 65.0                 | 3,463               | 0.4   |
| 6/30/2020                             | 27                       | 40                                      | 13                          | 67.5                 | 3,478               | 0.4   |
| 6/30/2021                             | 28                       | 41                                      | 13                          | 68.3                 | 3,622               | 0.4   |



## **SECTION VIII – RISK CONSIDERATIONS**

A typical retirement plan faces many different risks, but the greatest risk is the inability to make benefit payments when due. If plan assets are depleted, benefits may not be paid which could create legal and litigation risk or the plan could become “pay as you go”. The term “risk” is most commonly associated with an outcome with undesirable results. However, in the actuarial world, risk can be translated as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements to deviate from expected results due to actual experience that is different than the actuarial assumptions.

The various risk factors for a given plan can have a significant impact – positive or negative – on the actuarial projection of liability and contribution rates.

There are a number of risks inherent in the funding of a defined benefit plan. These include:

- economic risks, such as investment return and price inflation;
- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay and
- external risks such as the regulatory and political environment.

There is a direct correlation between healthy, well-funded retirement plans and consistent contributions equal to the full actuarial contribution rate each year. The System is primarily funded by member and employer contributions to the trust fund, together with the earnings on these accumulated contributions. These contributions fund benefit accruals for current active members and administrative expenses. The remainder of the contributions amortizes the unfunded actuarial accrued liability. The contribution rates are set by state statute and are intended to provide the needed amounts to fund the system over time. The purpose of the valuation is to determine if the fixed employer and member contributions remain sufficient to fund the Plan. Due to the fixed nature of the contributions actuarial gains and losses are reflected in the amortization period. Generally, the largest source of actuarial gains and losses are caused by investment volatility. In addition, the unfunded liability is amortized as a level percentage of pay assuming payroll will grow by 1.75% per year. A key risk factor to the System’s funding is that over time, the Statutory Contribution Rates will be insufficient to accumulate enough funds, with investment income, to fund the promised benefits. The funding insufficiency can be caused by amortization periods that are too long or by payroll not growing at the assumed rate.

The other significant risk factor for the System is investment return because of the volatility of returns and the size of plan assets compared to payroll. A perusal of historical returns over 10-20 years reveals that the actual return each year is rarely close to the average return for the same period. This is to be expected, given the underlying capital market assumptions and the System’s asset allocation. To the extent market rates of interest affect the expected return on assets, there is a risk of change to the discount rate which determines the present value of liabilities and actuarial valuation results.





A key demographic risk for the Retirement System is improvements in mortality (longevity) greater than anticipated. Mortality risk arises because there is unexpected mortality improvement, perhaps from a significant medical breakthrough that could quickly increase liabilities. While this is an exposure to risk, it represents a small probability.

The following exhibits summarize some historical information that helps indicate how certain key risk metrics have changed over time. Many are due to the maturing of the retirement system.



### Historical Asset Volatility Ratios (in 1,000's)

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members, on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio, is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility. In other words, it will be harder to recover from investment losses with increased contributions.

| Fiscal Year End | Market Value of Assets<br>(\$ Millions) | Covered Payroll<br>(\$ Millions) | Asset Volatility Ratio |
|-----------------|---|----------------------------------|------------------------|
| 6/30/2008       | \$10,793                                | \$2,652                          | 4.07                   |
| 6/30/2009       | 8,134                                   | 2,787                            | 2.92                   |
| 6/30/2010       | 9,072                                   | 2,843                            | 3.19                   |
| 6/30/2011       | 10,619                                  | 2,852                            | 3.72                   |
| 6/30/2012       | 10,332                                  | 2,788                            | 3.71                   |
| 6/30/2013       | 11,300                                  | 2,747                            | 4.11                   |
| 6/30/2014       | 12,821                                  | 2,759                            | 4.65                   |
| 6/30/2015       | 12,797                                  | 2,845                            | 4.50                   |
| 6/30/2016       | 12,452                                  | 2,932                            | 4.25                   |
| 6/30/2017       | 13,614                                  | 3,303                            | 4.12                   |
| 6/30/2018       | 14,271                                  | 3,332                            | 4.28                   |
| 6/30/2019       | 14,544                                  | 3,463                            | 4.20                   |
| 6/30/2020       | 14,420                                  | 3,478                            | 4.15                   |
| 6/30/2021       | 17,840                                  | 3,622                            | 4.93                   |

The assets at June 30, 2021 are 493% of payroll, so underperforming the investment return assumption by 1.00% (i.e., earn 6.00% for one year) is equivalent to 4.93% of payroll. While the actual impact in the first year is mitigated by the asset smoothing method and amortization of the UAL, this illustrates the risk associated with volatile investment returns.



### Historical Cash Flows

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments and administrative expenses. If the System has negative cash flows and then experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 5% of MVA that may cause significant concerns. The System has negative cash flows which range from 3% to 4% for the prior five years, so there is no immediate concern.

| Fiscal Year End | Market Value of Assets (\$ Millions) | Contributions (\$ Millions) | Benefit Payments & Expenses (\$ Millions) | Net Cash Flow (\$ Millions) | Net Cash Flow as % of Market Value |
|-----------------|--------------------------------------|-----------------------------|---|-----------------------------|------------------------------------|
| 6/30/2008       | \$10,793                             | \$564                       | \$740                                     | (\$176)                     | (1.63%)                            |
| 6/30/2009       | 8,134                                | 587                         | 779                                       | (192)                       | (2.36)                             |
| 6/30/2010       | 9,072                                | 704                         | 822                                       | (118)                       | (1.30)                             |
| 6/30/2011       | 10,619                               | 682                         | 880                                       | (197)                       | (1.86)                             |
| 6/30/2012       | 10,332                               | 697                         | 946                                       | (249)                       | (2.41)                             |
| 6/30/2013       | 11,300                               | 695                         | 1,020                                     | (325)                       | (2.88)                             |
| 6/30/2014       | 12,821                               | 701                         | 1,069                                     | (368)                       | (2.87)                             |
| 6/30/2015       | 12,797                               | 702                         | 1,156                                     | (455)                       | (3.56)                             |
| 6/30/2016       | 12,452                               | 751                         | 1,203                                     | (452)                       | (3.63)                             |
| 6/30/2017       | 13,614                               | 804                         | 1,256                                     | (451)                       | (3.31)                             |
| 6/30/2018       | 14,271                               | 760                         | 1,335                                     | (575)                       | (4.03)                             |
| 6/30/2019       | 14,544                               | 810                         | 1,368                                     | (558)                       | (3.84)                             |
| 6/30/2020       | 14,420                               | 844                         | 1,354                                     | (510)                       | (3.54)                             |
| 6/30/2021       | 17,840                               | 831                         | 1,387                                     | (556)                       | (3.12)                             |



### Liability Maturity Measurement

Most public sector retirement systems have been in operation for many years. As a result, they have aging plan populations, and in some cases declining active populations, resulting in an increasing ratio of retirees to active members and a growing percentage of retiree liability. The retirement of the remaining baby boomers over the next decade is expected to further exacerbate the aging of the retirement system population. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the system since it is more difficult to restore the system financially after losses occur when there is comparatively less payroll over which to spread costs. Below are two tables which demonstrate the ratio of the System's retiree liability compared to the total accrued liability and the ratio of the number of retirees and beneficiaries to the number of active members.

| Fiscal Year End | Retiree Liability (\$ Millions) | Total Actuarial Liability (\$ Millions) | Retiree Percentage |
|-----------------|---------------------------------|---|--------------------|
| 6/30/2008       | \$7,161                         | \$14,062                                | 0.51               |
| 6/30/2009       | 7,592                           | 14,582                                  | 0.52               |
| 6/30/2010       | 7,942                           | 15,222                                  | 0.52               |
| 6/30/2011       | 8,605                           | 16,325                                  | 0.53               |
| 6/30/2012       | 9,250                           | 16,755                                  | 0.55               |
| 6/30/2013       | 9,793                           | 17,247                                  | 0.57               |
| 6/30/2014       | 10,437                          | 17,882                                  | 0.58               |
| 6/30/2015       | 11,047                          | 18,503                                  | 0.60               |
| 6/30/2016       | 11,702                          | 19,771                                  | 0.59               |
| 6/30/2017       | 11,679                          | 19,588                                  | 0.60               |
| 6/30/2018       | 12,399                          | 19,998                                  | 0.62               |
| 6/30/2019       | 12,629                          | 20,527                                  | 0.62               |
| 6/30/2020       | 12,949                          | 21,034                                  | 0.62               |
| 6/30/2021       | 13,346                          | 21,530                                  | 0.62               |



### Historical Member Statistics

| Fiscal Year End | Active Count | Retiree Count | Active to Retiree Ratio |
|-----------------|--------------|---------------|-------------------------|
| 6/30/2008       | 124,370      | 64,818        | 1.92                    |
| 6/30/2009       | 125,465      | 65,757        | 1.91                    |
| 6/30/2010       | 126,015      | 66,127        | 1.91                    |
| 6/30/2011       | 125,337      | 67,221        | 1.86                    |
| 6/30/2012       | 121,811      | 69,038        | 1.76                    |
| 6/30/2013       | 121,642      | 70,771        | 1.72                    |
| 6/30/2014       | 121,251      | 72,605        | 1.67                    |
| 6/30/2015       | 122,855      | 74,372        | 1.65                    |
| 6/30/2016       | 124,540      | 76,280        | 1.63                    |
| 6/30/2017*      | 157,981      | 79,157        | 2.00                    |
| 6/30/2018       | 158,343      | 81,332        | 1.95                    |
| 6/30/2019       | 159,363      | 81,024        | 1.97                    |
| 6/30/2020       | 156,579      | 80,851        | 1.94                    |
| 6/30/2021       | 146,646      | 80,721        | 1.82                    |

\*Effective in FY2017, the active member headcount reflects an increase of members who have been re-categorized from inactive to active status.



## SCHEDULE A

### Valuation Balance Sheet and Solvency Test

The following valuation balance sheet shows the assets and liabilities of the retirement system as of the current valuation date of June 30, 2021, and, for comparison purposes, as of the immediately preceding valuation date of June 30, 2020. The items shown in the balance sheet are present values actuarially determined as of the relevant valuation date.

#### VALUATION BALANCE SHEET SHOWING THE ASSETS AND LIABILITIES OF THE SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO

|   | June 30, 2021            | June 30, 2020            |
|---|--------------------------|--------------------------|
| <b>ASSETS</b>   |                          |                          |
| Current actuarial value of assets   | \$ 16,031,612,792        | \$ 15,036,735,150        |
| Prospective contributions   |                          |                          |
| Member contributions  | \$ 3,207,536,291         | \$ 2,703,860,159         |
| Employer normal contributions   | 326,395,435              | (59,723,240)             |
| Unfunded accrued liability contributions  | <u>5,498,144,212</u>     | <u>5,997,074,169</u>     |
| Total prospective contributions   | <u>\$ 9,032,075,938</u>  | <u>\$ 8,641,211,088</u>  |
| Total assets  | <u>\$ 25,063,688,730</u> | <u>\$ 23,677,946,238</u> |
| <b>LIABILITIES</b>  |                          |                          |
| Present value of benefits payable on account of present retired members and beneficiaries | \$ 12,985,430,420        | \$ 12,617,926,715        |
| Present value of benefits payable on account of active members                            | 11,359,283,752           | 10,400,803,877           |
| Present value of benefits payable on account of inactive and deferred vested members      | <u>718,974,558</u>       | <u>659,215,646</u>       |
| Total liabilities   | <u>\$ 25,063,688,730</u> | <u>\$ 23,677,946,238</u> |



The following table provides the solvency test for SERS members. The table allocates the valuation assets of the System to its liabilities based on an order of precedence. The highest order of precedence is active member contributions. The second highest order of precedence are members in pay status, and vested and non-vested terminated members. The lowest order of precedence is the employer financed portion of active member accrued benefits. The liabilities are determined using the System's assumed rate of return.

**Solvency Test**  
(\$ Millions)

| Valuation Date                        | Aggregate Accrued Liabilities For  |  |   | Actuarial Value of Assets | Portion of Accrued Liabilities Covered by Reported Asset |       |      |
|---------------------------------------|------------------------------------|--|---|---------------------------|--|-------|------|
|                                       | (1)<br>Active Member Contributions | (2)<br>Retired Members & Beneficiaries | (3)<br>Active Members (Employer Financed Portion) |                           | (1)  | (2)   | (3)  |
| <b>Pension Benefits</b>               |                                    |  |   |                           |  |       |      |
| 6/30/2016                             | \$ 2,914                           | \$ 11,689                              | \$ 4,728  | \$ 13,015                 | 100.0%   | 86.4% | 0.0% |
| 6/30/2017                             | 3,010                              | 11,690                                 | 4,448   | 13,537                    | 100.0  | 90.0  | 0.0  |
| 6/30/2018                             | 2,733                              | 12,427                                 | 4,399   | 13,824                    | 100.0  | 89.2  | 0.0  |
| 6/30/2019                             | 2,842                              | 12,666                                 | 4,582   | 14,268                    | 100.0  | 90.2  | 0.0  |
| 6/30/2020                             | 2,934                              | 13,009                                 | 4,658   | 14,811                    | 100.0  | 91.3  | 0.0  |
| 6/30/2021                             | 2,986                              | 13,434                                 | 4,677   | 15,781                    | 100.0  | 95.2  | 0.0  |
| <b>Medicare Part B</b>                |                                    |  |   |                           |  |       |      |
| 6/30/2016                             | \$ 0                               | \$ 251                                 | \$ 151  | \$ 142                    | 100.0%   | 56.6% | 0.0% |
| 6/30/2017                             | 0                                  | 251                                    | 151   | 153                       | 100.0  | 61.0  | 0.0  |
| 6/30/2018                             | 0                                  | 251                                    | 149   | 164                       | 100.0  | 65.3  | 0.0  |
| 6/30/2019                             | 0                                  | 244                                    | 153   | 180                       | 100.0  | 73.8  | 0.0  |
| 6/30/2020                             | 0                                  | 236                                    | 157   | 199                       | 100.0  | 84.3  | 0.0  |
| 6/30/2021                             | 0                                  | 238                                    | 154   | 223                       | 100.0  | 93.7  | 0.0  |
| <b>Post-Retirement Death Benefits</b> |                                    |  |   |                           |  |       |      |
| 6/30/2016                             | \$ 0                               | \$ 30                                  | \$ 8  | \$ 22                     | 100.0%   | 73.3% | 0.0% |
| 6/30/2017                             | 0                                  | 30                                     | 8   | 23                        | 100.0  | 76.7  | 0.0  |
| 6/30/2018                             | 0                                  | 31                                     | 8   | 24                        | 100.0  | 77.4  | 0.0  |
| 6/30/2019                             | 0                                  | 31                                     | 8   | 25                        | 100.0  | 80.6  | 0.0  |
| 6/30/2020                             | 0                                  | 31                                     | 8   | 27                        | 100.0  | 87.1  | 0.0  |
| 6/30/2021                             | 0                                  | 33                                     | 7   | 28                        | 100.0  | 84.8  | 0.0  |



**SCHEDULE B  
Development of Actuarial Value of Assets**

| Valuation date June 30:                         | 2020               | 2021               | 2022             | 2023           | 2024           |
|---|--------------------|--------------------|------------------|----------------|----------------|
| A. Actuarial Value Beginning of Year            | \$ 14,936,900,093  | \$ 15,519,346,628  |                  |                |                |
| B. Market Value End of Year                     | 14,902,210,105     | 18,440,377,176     |                  |                |                |
| C. Market Value Beginning of Year               | 15,007,886,783     | 14,902,210,105     |                  |                |                |
| D. Cash Flow                                    |                    |                    |                  |                |                |
| D1. Contributions                               | \$ 892,087,903     | \$ 884,166,838     |                  |                |                |
| D2. Other Revenue                               | 97,386,324         | 84,050,104         |                  |                |                |
| D3. Benefit Payments                            | (1,485,382,246)    | (1,497,119,145)    |                  |                |                |
| D4. Net Transfers                               | <u>(3,411,620)</u> | <u>(5,424,513)</u> |                  |                |                |
| D5. Net   | \$ (499,319,639)   | \$ (534,326,716)   |                  |                |                |
| E. Investment Income                            |                    |                    |                  |                |                |
| E1. Market Total: B.-C.-D5.                     | \$ 393,642,961     | \$ 4,072,493,787   |                  |                |                |
| E2. Assumed Rate (Net of Expenses)              | 7.50%              | 7.50%              |                  |                |                |
| E3. Amount for Immediate Recognition            | 1,106,867,022      | 1,097,628,506      |                  |                |                |
| E4. Amount for Phased-In Recognition            | (713,224,061)      | 2,974,865,281      |                  |                |                |
| F. Phased-In Recognition of Investment Income   |                    |                    |                  |                |                |
| F1. Current Year: 0.25 * E4.                    | \$ (178,306,015)   | \$ 743,716,320     | \$ 0             | \$ 0           | \$ 0           |
| F2. First Prior Year                            | (66,102,732)       | (178,306,015)      | 743,716,320      | 0              | 0              |
| F3. Second Prior Year                           | 49,986,989         | (66,102,732)       | (178,306,015)    | 743,716,320    | 0              |
| F4. Third Prior Year                            | 169,320,910        | 49,986,989         | (66,102,732)     | (178,306,015)  | 743,716,320    |
| F5. Total Recognized Investment Gain/(Loss)     | \$ (25,100,848)    | \$ 549,294,562     | \$ 499,307,573   | \$ 565,410,305 | \$ 743,716,320 |
| G. Preliminary Actuarial Value End of Year:     |                    |                    |                  |                |                |
| A.+D5.+E3.+F5.                                  | \$ 15,519,346,628  | \$ 16,631,942,980  |                  |                |                |
| H. Corridor                                     |                    |                    |                  |                |                |
| H1. 80% of Market Value                         | \$ 11,921,768,084  | \$ 14,752,301,741  |                  |                |                |
| H2. 120% of Market Value                        | \$ 17,882,652,126  | \$ 22,128,452,611  |                  |                |                |
| I. Actuarial Value End of Year:                 |                    |                    |                  |                |                |
| G. Not Less than H1. or Not Greater than H2.    | \$ 15,519,346,628  | \$ 16,631,942,980  |                  |                |                |
| J. Difference Between Market & Actuarial Values | \$ (617,136,523)   | \$ 1,808,434,196   | \$ 1,309,126,624 | \$ 743,716,320 | \$ 0           |
| K. Health Care Valuation Assets                 | \$ 482,611,478     | \$ 600,330,188     |                  |                |                |
| L. Basic Benefits Valuation Assets (G. - K.)    | \$ 15,036,735,150  | \$ 16,031,612,792  |                  |                |                |

The Actuarial Valuation of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased in over a closed four-year period. During periods when investment performance exceeds the assumed rate, Actuarial Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Actuarial Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for four consecutive years, actuarial value will become equal to market value.





**SCHEDULE C**

**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, 2020, adopted by the Board on April 15, 2021.

INTEREST RATE: 7.00% 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       | 40.00%                     |
| 1       | 19.00                      |
| 2       | 11.00                      |
| 3       | 9.00                       |
| 4       | 8.00                       |
| 5       | 6.50                       |
| 10      | 3.50                       |
| 15      | 2.25                       |

| Age | Annual Rates of |        |            |        |
|-----|-----------------|--------|------------|--------|
|     | Death *         |        | Disability |        |
|     | Male            | Female | Male       | Female |
| 20  | .041%           | .013%  | .020%      | .010%  |
| 25  | .041            | .012   | .039       | .010   |
| 30  | .052            | .019   | .071       | .028   |
| 35  | .068            | .030   | .127       | .059   |
| 40  | .096            | .047   | .214       | .106   |
| 45  | .143            | .072   | .313       | .180   |
| 50  | .218            | .107   | .414       | .300   |
| 55  | .320            | .157   | .530       | .450   |
| 60  | .466            | .238   | .590       | .450   |
| 65  | .682            | .380   | .533       | .300   |
| 70  | 1.025           | .627   | .300       | .200   |
| 74  | 1.461           | .937   | .300       | .200   |

\* Pre-retirement mortality is based on the PUB-2010 General Amount Weighted Below Median Employee Mortality Table with fully generational projection using the MP-2020 projection scale. 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  |                                     |                 | 21%                      | 19%                  |                                  |                 |                          |                      |
| 55  |                                     | 10%             | 27%                      | 19%                  |                                  |                 |                          |                      |
| 57  |                                     | 10%             | 27%                      | 19%                  |                                  |                 | 30%                      | 19%                  |
| 60  | 43%                                 | 15%             | 27%                      | 19%                  |                                  | 6%              | 30%                      | 19%                  |
| 62  | 43%                                 | 15%             | 27%                      | 19%                  | 5%                               | 6%              | 30%                      | 19%                  |
| 65  |                                     |                 | 50%                      | 33%                  | 15%                              | 17%             | 30%                      | 19%                  |
| 68  |                                     |                 | 50%                      | 33%                  |                                  |                 | 30%                      | 18%                  |
| 70  |                                     |                 | 50%                      | 33%                  |                                  |                 | 30%                      | 18%                  |
| 75  |                                     |                 | 100%                     | 100%                 |                                  |                 | 100%                     | 100%                 |

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

| Service   | Merit & Seniority (A) | Annual Rates of    |                                      |
|-----------|-----------------------|--------------------|--------------------------------------|
|           |                       | Base (Economy) (B) | Increase Next Year $(1+(A))*(1+(B))$ |
| 0         | 10.00%                | 3.25%              | 13.58%                               |
| 1         | 3.00                  | 3.25               | 6.35                                 |
| 2         | 1.75                  | 3.25               | 5.06                                 |
| 3         | 1.25                  | 3.25               | 4.54                                 |
| 4         | 1.00                  | 3.25               | 4.28                                 |
| 5-9       | 0.75                  | 3.25               | 4.02                                 |
| 10-15     | 0.50                  | 3.25               | 3.77                                 |
| 16-17     | 0.25                  | 3.25               | 3.51                                 |
| 18 & over | 0.00                  | 3.25               | 3.25                                 |

**PAYROLL GROWTH:** 1.75% per annum, compounded annually.

**PRICE INFLATION:** 2.40% per annum, compounded annually.

**ANNUAL COLA:** Increase of 2.00% of initial retirement allowance on anniversary of retirement date. On and after April 1, 2018, COLAs for future retirees will be delayed for until the fourth anniversary of benefit commencement.

**DEATH AFTER RETIREMENT:** These assumptions are used to measure the probabilities of each benefit payment being made after retirement.

**SERVICE RETIREMENT:** PUB-2010 General Employee Amount Weighted Below Median Healthy Retiree mortality table projected to 2017 with ages set forward 1 year and adjusted 94.20% for males and set forward 2 years and adjusted 81.35% for females. Future improvement in mortality rates is reflected by applying the MP-2020 projection scale generationally.



**DISABLED RETIREMENT:** PUB-2010 General Disabled Retiree mortality table projected to 2017 with ages set forward 5 years and adjusted 103.3% for males and set forward 3 years and adjusted 106.8% for females. Future improvement in mortality rates is reflected by applying the MP-2020 projection scale generationally.

**CONTINGENT SURVIVOR:** PUB-2010 General Amount Weighted Below Median Contingent Survivor mortality table projected to 2017 with ages set forward 1 year and adjusted 105.5% for males and adjusted 122.5% for females. Future improvement in mortality rates is reflected by applying the MP-2020 projection scale generationally.

**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 D

### SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO Summary of Benefit and Contribution Provisions

|   |  |
|---|--|
| <b>Contributions for Basic Benefits</b>   | Members contribute 10% of pay and employers contribute 14% of pay. Employer contributions not required to finance basic benefits may be allocated to the health care program.  |
| <b>Final Average Salary</b>   | Average annual salary over the member's three highest years of service.  |
| <b>Normal Retirement</b>  |  |
| Condition for Retirement  |  |
| <i>Retire before August 1, 2017 or have 25 years of service or more on or before August 1, 2017</i> | Attainment of age 65 with at least 5 years of creditable service, or completion of 30 years of creditable service, regardless of age.  |
| <i>Members attaining 25 years of service after August 1, 2017</i>                                   | Attainment of age 67 with at least 10 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: <ol style="list-style-type: none"><li>1. Money Purchase - the greater of:<br/>The sum of:<ol style="list-style-type: none"><li>a. An annuity based on the value of the member's accumulated contributions at retirement</li><li>b. A pension equal to the annuity</li><li>c. For members who have 10 or more years of service credit prior to 10/1/1956, an annual benefit of \$180.</li></ol></li><li>2. Defined Benefit - the greater of:<br/>The sum of:<ol style="list-style-type: none"><li>a. 2.2% of final average salary multiplied by the member's years of service up to 30,</li><li>b. 2.5% of final average salary multiplied by the member's years of service in excess of 30,</li></ol>or:<ol style="list-style-type: none"><li>c. \$86 multiplied by the years of service.</li></ol></li></ol> |



## 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 5 years of service.

*Members attaining 25 years of service after August 1, 2017*

Attainment of age 62 with at least 10 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<br/>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:

| <b><u>Number of Qualified Survivors</u></b> | <b><u>Annual Benefit as Percent of Member's FAS</u></b> | <b><u>Minimum Monthly Allowance</u></b> |
|---|---|---|
| 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:

| <b><u>Years of Service</u></b> | <b><u>Annual Benefit as Percent of Member's FAS</u></b> |
|--------------------------------|---|
| 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 62<sup>nd</sup> 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 may be 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%. COLAs shall be suspended for calendar years 2018, 2019, and 2020.

**On and after 4/1/2018:** COLAs for future retirees will be delayed until the fourth anniversary of benefit 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 | <p>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.</p> <p>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.</p>  |
| 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.   |
| <b>Member Contributions</b> | 10% of salary.   |



**SCHEDULE E**

**DETAILED TABULATIONS OF THE DATA**

**Schedule of Retiree Members Added to and Removed From Rolls  
Last Six Fiscal Years**

| <b>Year Ending June 30:</b>                | <b>2016</b>      | <b>2017</b>      | <b>2018</b>      | <b>2019</b>      | <b>2020</b>      | <b>2021</b>      |
|--|------------------|------------------|------------------|------------------|------------------|------------------|
| <b><u>Number of Retiree Members</u></b>    |                  |                  |                  |                  |                  |                  |
| Beginning of Year                          | 74,372           | 76,280           | 79,157           | 81,332           | 81,024           | 80,851           |
| Added                                      | 4,388            | 5,499            | 5,339            | 3,055            | 2,902            | 3,928            |
| Removed                                    | 2,480            | 2,622            | 3,164            | 3,363            | 3,075            | 4,058            |
| End of Year                                | 76,280           | 79,157           | 81,332           | 81,024           | 80,851           | 80,721           |
| <b><u>Annual Retirement Allowances</u></b> |                  |                  |                  |                  |                  |                  |
| Beginning of Year                          | \$ 1,020,368,894 | \$ 1,083,621,579 | \$ 1,162,015,515 | \$ 1,211,935,636 | \$ 1,218,955,506 | \$ 1,234,342,326 |
| Added                                      | 66,860,652       | 70,973,748       | 74,311,354       | 56,557,169       | 52,895,232       | 70,415,860       |
| Removed                                    | 3,607,967        | (7,420,188)      | 24,391,233       | 49,537,299       | 37,508,412       | 49,823,424       |
| End of Year                                | \$ 1,083,621,579 | \$ 1,162,015,515 | \$ 1,211,935,636 | \$ 1,218,955,506 | \$ 1,234,342,326 | \$ 1,254,934,762 |
| <br>                                       |                  |                  |                  |                  |                  |                  |
| % Increase in Allowances                   | 6.20%            | 7.23%            | 4.30%            | 0.58%            | 1.26%            | 1.67%            |
| <br>                                       |                  |                  |                  |                  |                  |                  |
| Average Annual Allowance                   | \$ 14,206        | \$ 14,680        | \$ 14,901        | \$ 15,044        | \$ 15,267        | \$ 15,547        |



**Schedule of Retiree Members Receiving a Medicare Part B Reimbursement  
Added to and Removed from Rolls  
Last Three Fiscal Years**

| Year Ending June 30:                       | 2019          | 2020         | 2021         |
|--|---------------|--------------|--------------|
| <b><u>Number of Retiree Members</u></b>    |               |              |              |
| Beginning of Year                          | 43,645        | 43,534       | 42,464       |
| Added                                      | 2,222         | 2,257        | 1,996        |
| Removed                                    | 2,333         | 3,327        | 3,100        |
| End of Year                                | 43,534        | 42,464       | 41,360       |
| <b><u>Annual Retirement Allowances</u></b> |               |              |              |
| Beginning of Year                          | \$ 23,830,170 | \$23,769,564 | \$23,185,344 |
| Added                                      | 1,213,212     | 1,232,322    | 1,089,816    |
| Removed                                    | 1,273,818     | 1,816,542    | 1,692,600    |
| End of Year                                | \$ 23,769,564 | \$23,185,344 | \$22,582,560 |
| <br>                                       |               |              |              |
| % Increase in Allowances                   | (0.25)%       | (2.46)%      | (2.60)%      |
| <br>                                       |               |              |              |
| Average Annual Allowance                   | \$ 546        | \$ 546       | \$ 546       |



**Annuity and Pension Reserve Fund  
Retiree Information as of June 30, 2021  
Tabulated by Type of Benefit**

| Amount of<br>Monthly Benefit |       | Total         | Service       | Disability   | Survivor   |
|------------------------------|-------|---------------|---------------|--------------|------------|
| \$ 1 - \$                    | 250   | 9,701         | 8,987         | 30           | 684        |
| 251 -                        | 500   | 11,053        | 9,704         | 285          | 1,064      |
| 501 -                        | 750   | 10,776        | 9,403         | 559          | 814        |
| 751 -                        | 1,000 | 9,671         | 8,252         | 818          | 601        |
| 1,001 -                      | 1,500 | 14,347        | 12,540        | 1,261        | 546        |
| 1,501 -                      | 2,000 | 8,855         | 7,829         | 796          | 230        |
| Over                         | 2,000 | <u>16,318</u> | <u>14,942</u> | <u>1,119</u> | <u>257</u> |
|                              |       | 80,721        | 71,657        | 4,868        | 4,196      |

|                         |          |          |        |
|-------------------------|----------|----------|--------|
| Average Monthly Benefit | \$ 1,313 | \$ 1,502 | \$ 794 |
| Average Age             | 74.6     | 66.2     | 76.8   |

The 71,657 service retirees shown in the table above are comprised of 66,265 service retirees and 5,392 beneficiaries of deceased retirees. Excluded from the 66,265 service retirees are 799 reemployed retirees who are receiving a pension-only benefit resulting from the annuitization of the contributions accumulated during active membership. Multiple benefit recipients account for the higher total headcount than shown elsewhere in the report.



**Annuity and Pension Reserve Fund  
Retiree Information as of June 30, 2021  
Tabulated by Attained Ages**

| Attained Age | Retirement |                  | Disability Retirement |                 | Total  |                  |
|--------------|------------|------------------|-----------------------|-----------------|--------|------------------|
|              | Number     | Annual Benefits  | Number                | Annual Benefits | Number | Annual Benefits  |
| Under 45     | 44         | \$ 360,224       | 39                    | \$ 528,467      | 83     | \$ 888,691       |
| 45-49        | 37         | \$ 520,032       | 106                   | \$ 1,541,014    | 143    | \$ 2,061,046     |
| 50-54        | 234        | \$ 7,981,594     | 300                   | \$ 5,204,889    | 534    | \$ 13,186,482    |
| 55-59        | 1,285      | \$ 43,704,932    | 694                   | \$ 12,534,104   | 1,979  | \$ 56,239,036    |
| 60-64        | 5,994      | \$ 131,479,738   | 1343                  | \$ 25,211,804   | 7,337  | \$ 156,691,542   |
| 65-69        | 15,403     | \$ 251,298,398   | 759                   | \$ 16,848,693   | 16,162 | \$ 268,147,091   |
| 70-74        | 16,234     | \$ 260,969,283   | 646                   | \$ 12,808,932   | 16,880 | \$ 273,778,215   |
| 75-79        | 12,059     | \$ 177,784,857   | 449                   | \$ 6,874,234    | 12,508 | \$ 184,659,092   |
| 80-84        | 9,608      | \$ 131,622,553   | 301                   | \$ 3,787,052    | 9,909  | \$ 135,409,605   |
| 85-89        | 6,445      | \$ 77,216,503    | 163                   | \$ 1,592,746    | 6,608  | \$ 78,809,249    |
| 90 & Over    | 4,314      | \$ 41,425,449    | 68                    | \$ 458,553      | 4,382  | \$ 41,884,002    |
| Totals       | 71,657     | \$ 1,124,363,563 | 4,868                 | \$ 87,390,489   | 76,525 | \$ 1,211,754,052 |

The 71,657 service retirees shown in the table above are comprised of 70,771 unique service retirees, and 799 unique reemployed retirees. The reemployed retirees included in the tabulation above are those who are receiving a pension-only benefit resulting from the annuitization of the contributions accumulated during active membership.



**Annuity and Pension Reserve Fund  
Survivors of Annuitants Information as of June 30, 2021  
Tabulated by Attained Ages**

| Attained Age | Life Annuities |                 | Periods Certain |                 | Total  |                 |
|--------------|----------------|-----------------|-----------------|-----------------|--------|-----------------|
|              | Number         | Annual Benefits | Number          | Annual Benefits | Number | Annual Benefits |
| Under 45     | 44             | \$ 360,224      | 0               | \$ -            | 44     | \$ 360,224      |
| 45-49        | 27             | \$ 188,643      | 0               | \$ -            | 27     | \$ 188,643      |
| 50-54        | 52             | \$ 531,870      | 0               | \$ -            | 52     | \$ 531,870      |
| 55-59        | 74             | \$ 703,026      | 0               | \$ -            | 74     | \$ 703,026      |
| 60-64        | 209            | \$ 2,656,248    | 2               | \$ 23,368       | 211    | \$ 2,679,616    |
| 65-69        | 380            | \$ 5,280,485    | 1               | \$ 18,261       | 381    | \$ 5,298,746    |
| 70-74        | 680            | \$ 8,271,224    | 16              | \$ 163,489      | 696    | \$ 8,434,713    |
| 75-79        | 925            | \$ 9,710,576    | 7               | \$ 97,851       | 932    | \$ 9,808,427    |
| 80-84        | 1,080          | \$ 10,453,360   | 2               | \$ 6,716        | 1,082  | \$ 10,460,076   |
| 85-89        | 1,048          | \$ 9,290,562    | 0               | \$ -            | 1,048  | \$ 9,290,562    |
| 90 & Over    | 845            | \$ 6,089,155    | 0               | \$ -            | 845    | \$ 6,089,155    |
| Totals       | 5,364          | \$ 53,535,373   | 28              | \$ 309,685      | 5,392  | \$ 53,845,058   |



**All Benefit Recipients  
Male and Female Demographic Breakdown  
June 30, 2021**

| Attained<br>Age | Number of     |               | Total<br>Number |
|-----------------|---------------|---------------|-----------------|
|                 | Males         | Females       |                 |
| Under 20        | 21            | 26            | 47              |
| 20-24           | 2             | 5             | 7               |
| 25-29           | 4             | 3             | 7               |
| 30-34           | 5             | 13            | 18              |
| 35-39           | 13            | 24            | 37              |
| 40-44           | 23            | 37            | 60              |
| 45-49           | 64            | 126           | 190             |
| 50-54           | 241           | 409           | 650             |
| 55-59           | 877           | 1,308         | 2,185           |
| 60-64           | 2,303         | 5,508         | 7,811           |
| 65-69           | 4,394         | 12,480        | 16,874          |
| 70-74           | 4,747         | 12,887        | 17,634          |
| 75-79           | 3,453         | 9,682         | 13,135          |
| 80-84           | 2,578         | 7,858         | 10,436          |
| 85-89           | 1,568         | 5,415         | 6,983           |
| 90-94           | 729           | 2,810         | 3,539           |
| 95-99           | 163           | 809           | 972             |
| 100             | 6             | 62            | 68              |
| 101             | 2             | 23            | 25              |
| 102             | 1             | 19            | 20              |
| 103             | 0             | 10            | 10              |
| 104             | 1             | 5             | 6               |
| 105 & Over      | 1             | 6             | 7               |
| <b>Total</b>    | <b>21,196</b> | <b>59,525</b> | <b>80,721</b>   |



**Survivor Benefit Fund**  
**Survivors of Deceased Active Members Information as of June 30, 2021**  
**Tabulated by Attained Ages**

| <b>Attained Age</b> | <b>Number</b> | <b>Annual Benefits</b> |
|---------------------|---------------|------------------------|
| Under 45            | 93            | \$ 1,030,594           |
| 45-49               | 47            | \$ 682,463             |
| 50-54               | 116           | \$ 1,541,279           |
| 55-59               | 206           | \$ 2,531,275           |
| 60-64               | 474           | \$ 4,825,381           |
| 65-69               | 712           | \$ 7,195,662           |
| 70-74               | 754           | \$ 7,640,404           |
| 75-79               | 627           | \$ 5,610,174           |
| 80-84               | 527           | \$ 4,511,217           |
| 85-89               | 375           | \$ 2,678,532           |
| 90 & Over           | 265           | \$ 1,589,003           |
| Totals              | 4,196         | \$ 39,835,984          |





**Total Active Members as of June 30, 2021  
Tabulated by Attained Ages and Years of Service**

| Attained Age   | Years of Service to Valuation Date |                 |                 |                 |                 |                 |                 | Totals          |
|----------------|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | 0-4                                | 5 - 9           | 10 - 14         | 15 - 19         | 20 - 24         | 25 - 29         | 30+             |                 |
| Under 20       | 2,141                              |                 |                 |                 |                 |                 |                 | 2,141           |
| Avg Pay        | \$10,407                           |                 |                 |                 |                 |                 |                 | \$10,407        |
| 20-24          | 8,571                              | 94              |                 |                 |                 |                 |                 | 8,665           |
| Avg Pay        | \$11,276                           | \$28,350        |                 |                 |                 |                 |                 | \$11,461        |
| 25-29          | 8,603                              | 1,115           | 24              |                 |                 |                 |                 | 9,742           |
| Avg Pay        | \$15,058                           | \$31,892        | \$42,948        |                 |                 |                 |                 | \$17,053        |
| 30-34          | 7,535                              | 2,147           | 364             | 26              |                 |                 |                 | 10,072          |
| Avg Pay        | \$16,842                           | \$33,769        | \$44,315        | \$47,530        |                 |                 |                 | \$21,522        |
| 35-39          | 8,417                              | 2,976           | 807             | 360             | 47              |                 |                 | 12,607          |
| Avg Pay        | \$16,708                           | \$32,682        | \$43,507        | \$50,641        | \$54,638        |                 |                 | \$23,305        |
| 40-44          | 9,125                              | 3,897           | 1,240           | 745             | 408             | 27              | 1               | 15,443          |
| Avg Pay        | \$16,190                           | \$30,022        | \$40,775        | \$48,590        | \$52,939        | \$70,391        | \$43,614        | \$24,285        |
| 45-49          | 8,397                              | 4,261           | 1,929           | 1,217           | 887             | 268             | 17              | 16,976          |
| Avg Pay        | \$15,101                           | \$29,479        | \$35,439        | \$43,173        | \$51,897        | \$56,374        | \$52,008        | \$25,644        |
| 50-54          | 7,343                              | 4,275           | 2,786           | 2,260           | 1,873           | 653             | 193             | 19,383          |
| Avg Pay        | \$15,777                           | \$29,320        | \$32,119        | \$38,073        | \$43,252        | \$54,944        | \$57,377        | \$28,101        |
| 55-59          | 5,706                              | 3,514           | 2,758           | 3,211           | 3,610           | 1,418           | 581             | 20,798          |
| Avg Pay        | \$15,768                           | \$28,778        | \$32,180        | \$34,633        | \$38,829        | \$45,009        | \$53,338        | \$30,101        |
| 60-64          | 4,578                              | 2,669           | 2,030           | 2,599           | 3,734           | 2,100           | 991             | 18,701          |
| Avg Pay        | \$14,070                           | \$27,616        | \$31,636        | \$34,761        | \$36,275        | \$39,407        | \$45,654        | \$29,738        |
| 65-69          | 2,591                              | 1,186           | 745             | 725             | 1,060           | 793             | 757             | 7,857           |
| Avg Pay        | \$10,726                           | \$23,409        | \$29,840        | \$33,859        | \$37,541        | \$38,460        | \$41,181        | \$25,939        |
| 70 & over      | 1,770                              | 743             | 404             | 312             | 266             | 226             | 540             | 4,261           |
| Avg Pay        | \$8,304                            | \$18,081        | \$23,218        | \$27,960        | \$32,019        | \$37,148        | \$36,335        | \$19,425        |
| <b>Totals</b>  | <b>74,777</b>                      | <b>26,877</b>   | <b>13,087</b>   | <b>11,455</b>   | <b>11,885</b>   | <b>5,485</b>    | <b>3,080</b>    | <b>146,646</b>  |
| <b>Avg Pay</b> | <b>\$14,754</b>                    | <b>\$29,466</b> | <b>\$34,023</b> | <b>\$37,458</b> | <b>\$39,979</b> | <b>\$43,456</b> | <b>\$45,139</b> | <b>\$24,700</b> |

Averages:

Age: 47.7

Service: 8.1

Annual Pay: \$24,700



**Male Active Members as of June 30, 2021  
Tabulated by Attained Ages and Years of Service**

| Attained Age   | Years of Service to Valuation Date |                 |                 |                 |                 |                 |                 | Totals          |
|----------------|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | 0-4                                | 5 - 9           | 10 - 14         | 15 - 19         | 20 - 24         | 25 - 29         | 30+             |                 |
| Under 20       | 1,096                              |                 |                 |                 |                 |                 |                 | 1,096           |
| Avg Pay        | \$10,435                           |                 |                 |                 |                 |                 |                 | \$10,435        |
| 20-24          | 3,791                              | 54              |                 |                 |                 |                 |                 | 3,845           |
| Avg Pay        | \$11,421                           | \$31,906        |                 |                 |                 |                 |                 | \$11,138        |
| 25-29          | 3,662                              | 520             | 14              |                 |                 |                 |                 | 4,196           |
| Avg Pay        | \$15,050                           | \$37,260        | \$45,379        |                 |                 |                 |                 | \$17,904        |
| 30-34          | 2,804                              | 782             | 197             | 21              |                 |                 |                 | 3,804           |
| Avg Pay        | \$16,588                           | \$39,928        | \$50,358        | \$48,955        |                 |                 |                 | \$23,314        |
| 35-39          | 2,621                              | 885             | 359             | 207             | 30              |                 |                 | 4,102           |
| Avg Pay        | \$17,845                           | \$41,962        | \$50,843        | \$58,368        | \$62,061        |                 |                 | \$28,304        |
| 40-44          | 2,955                              | 906             | 404             | 287             | 192             | 15              | 1               | 4,760           |
| Avg Pay        | \$16,367                           | \$40,600        | \$53,492        | \$62,613        | \$64,221        | \$75,983        | \$43,726        | \$29,043        |
| 45-49          | 3,018                              | 897             | 432             | 295             | 303             | 130             | 7               | 5,082           |
| Avg Pay        | \$13,107                           | \$38,088        | \$49,942        | \$61,237        | \$65,925        | \$63,263        | \$59,713        | \$27,938        |
| 50-54          | 2,845                              | 999             | 485             | 388             | 383             | 240             | 90              | 5,430           |
| Avg Pay        | \$15,020                           | \$37,557        | \$44,975        | \$57,504        | \$62,966        | \$69,621        | \$61,775        | \$31,447        |
| 55-59          | 2,267                              | 1,025           | 619             | 531             | 492             | 264             | 222             | 5,420           |
| Avg Pay        | \$16,169                           | \$34,483        | \$43,545        | \$50,198        | \$57,910        | \$63,581        | \$63,055        | \$34,112        |
| 60-64          | 1,978                              | 972             | 584             | 512             | 500             | 275             | 269             | 5,090           |
| Avg Pay        | \$14,948                           | \$32,584        | \$38,730        | \$47,954        | \$52,080        | \$56,969        | \$59,522        | \$32,638        |
| 65-69          | 1,165                              | 548             | 317             | 201             | 199             | 98              | 131             | 2,659           |
| Avg Pay        | \$12,238                           | \$26,431        | \$33,864        | \$43,545        | \$48,289        | \$56,617        | \$57,009        | \$26,647        |
| 70 & over      | 879                                | 397             | 214             | 133             | 62              | 42              | 57              | 1,784           |
| Avg Pay        | \$9,355                            | \$20,813        | \$25,509        | \$31,030        | \$42,131        | \$43,174        | \$47,949        | \$18,627        |
| <b>Totals</b>  | <b>29,081</b>                      | <b>7,985</b>    | <b>3,625</b>    | <b>2,575</b>    | <b>2,161</b>    | <b>1,064</b>    | <b>777</b>      | <b>47,268</b>   |
| <b>Avg Pay</b> | <b>\$14,528</b>                    | <b>\$36,040</b> | <b>\$44,020</b> | <b>\$52,638</b> | <b>\$57,861</b> | <b>\$61,924</b> | <b>\$59,501</b> | <b>\$26,287</b> |

Averages:

Age: 45.9  
 Service: 6.2  
 Annual Pay: \$26,287

**Female Active Members as of June 30, 2021  
Tabulated by Attained Ages and Years of Service**



| Attained Age   | Years of Service to Valuation Date |                 |                 |                 |                 |                 |                 | Totals          |
|----------------|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | 0-4                                | 5 - 9           | 10 - 14         | 15 - 19         | 20 - 24         | 25 - 29         | 30+             |                 |
| Under 20       | 1,045                              |                 |                 |                 |                 |                 |                 | 1,045           |
| Avg Pay        | \$10,392                           |                 |                 |                 |                 |                 |                 | \$10,392        |
| 20-24          | 4,780                              | 40              |                 |                 |                 |                 |                 | 4,820           |
| Avg Pay        | \$11,169                           | \$21,334        |                 |                 |                 |                 |                 | \$11,254        |
| 25-29          | 4,941                              | 595             | 10              |                 |                 |                 |                 | 5,546           |
| Avg Pay        | \$15,072                           | \$27,247        | \$39,653        |                 |                 |                 |                 | \$16,423        |
| 30-34          | 4,731                              | 1,365           | 167             | 5               |                 |                 |                 | 6,268           |
| Avg Pay        | \$16,994                           | \$30,259        | \$37,288        | \$42,015        |                 |                 |                 | \$20,443        |
| 35-39          | 5,796                              | 2,091           | 448             | 153             | 17              |                 |                 | 8,505           |
| Avg Pay        | \$16,193                           | \$28,762        | \$37,683        | \$40,336        | \$41,763        |                 |                 | \$20,900        |
| 40-44          | 6,170                              | 2,991           | 836             | 458             | 216             | 12              |                 | 10,683          |
| Avg Pay        | \$16,103                           | \$26,813        | \$34,649        | \$39,850        | \$42,999        | \$63,559        |                 | \$22,168        |
| 45-49          | 5,379                              | 3,364           | 1,497           | 922             | 584             | 138             | 10              | 11,894          |
| Avg Pay        | \$16,217                           | \$27,173        | \$31,249        | \$37,394        | \$44,646        | \$49,970        | \$46,658        | \$24,662        |
| 50-54          | 4,498                              | 3,276           | 2,301           | 1,872           | 1,490           | 413             | 103             | 13,953          |
| Avg Pay        | \$16,258                           | \$26,801        | \$29,395        | \$34,031        | \$38,175        | \$46,456        | \$53,600        | \$26,794        |
| 55-59          | 3,439                              | 2,489           | 2,139           | 2,680           | 3,118           | 1,154           | 359             | 15,378          |
| Avg Pay        | \$15,511                           | \$26,430        | \$28,884        | \$31,533        | \$35,794        | \$40,743        | \$47,366        | \$28,680        |
| 60-64          | 2,600                              | 1,697           | 1,446           | 2,087           | 3,234           | 1,825           | 722             | 13,611          |
| Avg Pay        | \$13,412                           | \$24,784        | \$28,773        | \$31,512        | \$33,807        | \$36,733        | \$40,489        | \$28,646        |
| 65-69          | 1,426                              | 638             | 428             | 524             | 861             | 695             | 626             | 5,198           |
| Avg Pay        | \$9,505                            | \$20,843        | \$26,888        | \$30,145        | \$35,039        | \$35,872        | \$37,848        | \$25,577        |
| 70 & over      | 891                                | 346             | 190             | 179             | 204             | 184             | 483             | 2,477           |
| Avg Pay        | \$7,281                            | \$14,987        | \$20,683        | \$25,703        | \$28,940        | \$35,749        | \$34,933        | \$20,007        |
| <b>Totals</b>  | <b>45,696</b>                      | <b>18,892</b>   | <b>9,462</b>    | <b>8,880</b>    | <b>9,724</b>    | <b>4,421</b>    | <b>2,303</b>    | <b>99,378</b>   |
| <b>Avg Pay</b> | <b>\$14,902</b>                    | <b>\$26,691</b> | <b>\$30,196</b> | <b>\$33,050</b> | <b>\$35,989</b> | <b>\$38,998</b> | <b>\$40,291</b> | <b>\$23,944</b> |

**Averages:**

Age: 48.6  
 Service: 9.0  
 Annual Pay: \$23,944



**Active Members as of June 30, 2021  
Tabulated by Annual Pay**

| Annual Pay        | Number of Active Members |               |                | Portion of Total Number |            |
|-------------------|--------------------------|---------------|----------------|-------------------------|------------|
|                   | Men                      | Women         | Totals         | Group                   | Cumulative |
| Less than \$1,000 | 1,955                    | 3,290         | 5,245          | 3.6%                    | 3.6%       |
| \$1,000 - 1,999   | 2,421                    | 3,102         | 5,523          | 3.8%                    | 7.3%       |
| 2,000 - 2,999     | 3,148                    | 3,192         | 6,340          | 4.3%                    | 11.7%      |
| 3,000 - 3,999     | 3,146                    | 2,850         | 5,996          | 4.1%                    | 15.8%      |
| 4,000 - 4,999     | 2,437                    | 2,359         | 4,796          | 3.3%                    | 19.0%      |
| 5,000 - 5,999     | 1,794                    | 2,110         | 3,904          | 2.7%                    | 21.7%      |
| 6,000 - 6,999     | 1,387                    | 2,016         | 3,403          | 2.3%                    | 24.0%      |
| 7,000 - 7,999     | 1,062                    | 2,055         | 3,117          | 2.1%                    | 26.1%      |
| 8,000 - 8,999     | 895                      | 1,923         | 2,818          | 1.9%                    | 28.1%      |
| 9,000 - 9,999     | 782                      | 1,937         | 2,719          | 1.9%                    | 29.9%      |
| 10,000 - 11,999   | 1,378                    | 4,215         | 5,593          | 3.8%                    | 33.7%      |
| 12,000 - 13,999   | 1,324                    | 4,379         | 5,703          | 3.9%                    | 37.6%      |
| 14,000 - 15,999   | 1,260                    | 4,586         | 5,846          | 4.0%                    | 41.6%      |
| 16,000 - 17,999   | 1,305                    | 5,294         | 6,599          | 4.5%                    | 46.1%      |
| 18,000 - 19,999   | 1,258                    | 5,704         | 6,962          | 4.7%                    | 50.8%      |
| 20,000 - 24,999   | 3,069                    | 14,633        | 17,702         | 12.1%                   | 62.9%      |
| 25,000 - 29,999   | 2,416                    | 10,220        | 12,636         | 8.6%                    | 71.5%      |
| 30,000 - 35,999   | 2,618                    | 7,800         | 10,418         | 7.1%                    | 78.6%      |
| 36,000 - 39,999   | 1,881                    | 3,959         | 5,840          | 4.0%                    | 82.6%      |
| 40,000 - 49,999   | 4,556                    | 6,801         | 11,357         | 7.7%                    | 90.4%      |
| 50,000 - 59,999   | 3,079                    | 3,418         | 6,497          | 4.4%                    | 94.8%      |
| 60,000 and over   | 4,097                    | 3,535         | 7,632          | 5.2%                    | 100.0%     |
| <b>Totals</b>     | <b>47,268</b>            | <b>99,378</b> | <b>146,646</b> |                         |            |



## **SCHEDULE F**

### **GAIN/LOSS ANALYSIS DETAILS**

#### **COMMENTS**

Regular actuarial valuations measure the Retirement System's present financial position and contributions adequacy by calculating and financing the liabilities created by the present benefit program. This process involves discounting to present values the future benefit payments on behalf of present active and Retiree members and their survivors. However, valuations do not produce information regarding the amount of increases or decreases in unfunded actuarial accrued liabilities (UAAL) -- gain/loss analyses do.

The overall gain/loss to the Retirement System is the difference between the actual UAAL and the expected UAAL. A gain/loss analysis shows the breakdown of the overall system gain/loss by economic and non-economic risk areas. The economic risk areas are investment return and pay increases. The non-economic risk areas are service retirement, disability retirement, death in active service, termination (vested and non-vested), retiree mortality, and new members. Gains and losses resulting from data adjustments, timing of financial transactions, etc. are included separately as a miscellaneous item.

It is expected that actual experience will not coincide with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year-to-year fluctuations are common. Changes in actuarial assumptions should be made for risk areas when the differences between actual and expected experience are consistently sizable over a period of years. Differences over a relatively short period of time may or may not be indicative of long-term trends, which are the basis of actuarial assumptions.

The actuarial assumptions used in this analysis were adopted by the Board in April 15, 2021.



**School Employees Retirement System of Ohio**  
**Experience Gains and Losses By Risk Area**  
**Comparative Schedule**  
**(\$ Millions)**

| Year<br>Ending<br>June 30 | Gain (Loss) by Risk Area |            |                                |            |                        |            |                |                      |                    | \$      | % of AAL |
|---------------------------|--------------------------|------------|--------------------------------|------------|------------------------|------------|----------------|----------------------|--------------------|---------|----------|
|                           | Economic                 |            | Non-Economic                   |            |                        |            |                |                      |                    |         |          |
|                           | Pay<br>Increases         | Investment | Age &<br>Service<br>Retirement | Disability | Death<br>In<br>Service | Withdrawal | New<br>Members | Retiree<br>Mortality | Other <sup>+</sup> |         |          |
| 2012                      | 178.7                    | (692.0)    | (154.8)                        | (47.7)     | (0.2)                  | 46.5       | (29.8)         | 51.9                 | (6.2)              | (653.6) | (3.9)    |
| 2013                      | 219.2                    | 241.0      | (121.9)                        | (53.6)     | 0.0                    | 61.1       | (35.1)         | 2.9                  | 1.9                | 315.5   | 1.8      |
| 2014                      | 103.4                    | 403.3      | (122.6)                        | (56.0)     | 0.1                    | 48.3       | (28.2)         | 3.1                  | (2.1)              | 349.3   | 2.0      |
| 2015                      | 53.3                     | 62.1       | (123.0)                        | (53.1)     | 0.0                    | 65.1       | (47.7)         | 55.8                 | (0.2)              | 12.3    | 0.1      |
| 2016                      | 70.0                     | 50.6       | (140.9)                        | (50.6)     | (28.5)                 | 30.4       | (44.0)         | 113.9                | (0.6)              | 0.3     | 0.0      |
| 2017                      | (69.2)                   | (12.0)     | (211.8)                        | (37.7)     | (0.6)                  | 21.9       | (48.1)         | 97.3                 | (26.8)             | (287.0) | (1.5)    |
| 2018                      | 85.2                     | (161.1)    | (209.7)                        | (14.7)     | (6.6)                  | (124.5)    | (35.7)         | 15.0                 | 4.7                | (447.4) | (2.2)    |
| 2019                      | 20.3                     | (44.1)     | 7.8                            | (9.5)      | (4.0)                  | (106.3)    | (22.4)         | (24.9)               | 78.4               | (104.7) | (0.5)    |
| 2020                      | 136.2                    | 7.1        | (94.0)                         | (3.1)      | (5.4)                  | (104.2)    | (22.2)         | 28.9                 | 62.3               | 5.6     | 0.0      |
| 2021                      | 136.7                    | 431.3      | (96.2)                         | (5.0)      | (4.7)                  | (107.5)    | (16.6)         | 59.8                 | 189.3              | 587.1   | 2.7      |

<sup>+</sup> Includes effect of changes in data, timing of financial transactions, etc.



The market related actuarial value of assets is based on a four-year average of adjusted market value returns. The difference between the actual returns at market value for the year and expected returns is determined. Twenty-five percent (25%) of that difference is added to the expected value along with corresponding amounts from each of the prior three years.

The actuarial value of assets for the basic benefits as of June 30, 2021, was \$16,031,612,792. The value for the previous year was \$15,036,735,150.

| <b>School Employees Retirement System of Ohio<br/>Development of Gain (Loss) for Basic Benefits<br/>From Investment Return<br/>For the Year Ended June 30, 2021<br/>(\$ Millions)</b> |   | <b><u>\$ Millions</u></b> |
|---|---|---------------------------|
| 1.  | Actuarial value of assets as of June 30, 2020   | \$ 15,036.7               |
| 2.  | Actuarial value of assets as of June 30, 2021   |                           |
|   | a. Actual   | 16,031.6                  |
|   | b. If 7.50% assumed investment return<br>were achieved for all phased-in<br>years recognized in the asset<br>method | 15,600.3                  |
| 3.  | Gain (Loss): 2a minus 2b  | <u>\$ 431.3</u>           |



**Pay Increases During the FY2021 Valuation Year  
To Members Active at Beginning and End of Year**

| Central<br>Age Group<br>Beginning<br>of Year | Number  | Pay Increases |          |
|--|---------|---------------|----------|
|  |         | Actual        | Expected |
| Under 25                                     | 4,565   | (16.77)%      | 11.42%   |
| 25   | 6,991   | (5.74)        | 8.21     |
| 30   | 7,826   | (0.50)        | 6.62     |
| 35   | 10,012  | 1.30          | 5.97     |
| 40   | 13,113  | 1.95          | 5.54     |
| 45   | 14,585  | 1.52          | 5.03     |
| 50   | 17,808  | 1.29          | 4.59     |
| 55   | 19,217  | 0.63          | 4.7      |
| 60   | 18,249  | 0.80          | 3.99     |
| 65 & Over                                    | 12,662  | 0.34          | 4.15     |
| Total  | 125,028 | 0.54          | 4.97     |





**Members Who Became Age & Service Retirees During the FY2021 Valuation Year  
(Retirement With Allowance Beginning Immediately)**

| Attained Age  | Years of Service to Valuation Date |          |            |            |            |            |            | Total        |
|---------------|------------------------------------|----------|------------|------------|------------|------------|------------|--------------|
|               | 0-4                                | 5-9      | 10-14      | 15-19      | 20-24      | 25-29      | 30 plus    |              |
| Under 50      | 0                                  | 0        | 0          | 0          | 0          | 0          | 5          | 5            |
| 50            | 0                                  | 0        | 0          | 0          | 0          | 0          | 5          | 5            |
| 51            | 0                                  | 0        | 0          | 0          | 0          | 0          | 9          | 9            |
| 52            | 0                                  | 0        | 0          | 0          | 0          | 0          | 4          | 4            |
| 53            | 0                                  | 0        | 0          | 0          | 0          | 0          | 15         | 15           |
| 54            | 0                                  | 0        | 0          | 0          | 0          | 0          | 18         | 18           |
| 55            | 0                                  | 0        | 0          | 0          | 0          | 3          | 24         | 27           |
| 56            | 0                                  | 0        | 0          | 0          | 0          | 3          | 15         | 18           |
| 57            | 0                                  | 0        | 0          | 0          | 0          | 2          | 39         | 41           |
| 58            | 0                                  | 0        | 0          | 0          | 0          | 2          | 30         | 32           |
| 59            | 0                                  | 0        | 0          | 0          | 0          | 9          | 39         | 48           |
| 60            | 0                                  | 0        | 1          | 0          | 3          | 75         | 44         | 123          |
| 61            | 0                                  | 0        | 0          | 0          | 0          | 49         | 49         | 98           |
| 62            | 0                                  | 0        | 54         | 61         | 85         | 50         | 69         | 319          |
| 63            | 0                                  | 0        | 24         | 24         | 30         | 45         | 47         | 170          |
| 64            | 0                                  | 0        | 27         | 16         | 18         | 34         | 59         | 154          |
| 65            | 0                                  | 0        | 40         | 56         | 76         | 82         | 92         | 346          |
| 66            | 0                                  | 0        | 31         | 26         | 49         | 48         | 57         | 211          |
| 67            | 0                                  | 0        | 37         | 27         | 70         | 52         | 54         | 240          |
| 68            | 0                                  | 0        | 21         | 22         | 25         | 20         | 38         | 126          |
| 69            | 0                                  | 0        | 17         | 18         | 16         | 20         | 40         | 111          |
| 70 & Over     | 0                                  | 1        | 74         | 68         | 74         | 61         | 162        | 440          |
| <b>Totals</b> | <b>0</b>                           | <b>1</b> | <b>326</b> | <b>318</b> | <b>446</b> | <b>555</b> | <b>914</b> | <b>2,560</b> |

|                      | Years of Service to Valuation Date |           |           |           |           |           |           | Total     |
|----------------------|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                      | 0-4                                | 5-9       | 10-14     | 15-19     | 20-24     | 25-29     | 30 plus   |           |
| Avg. Monthly Benefit | \$ 0                               | \$ 302    | \$ 492    | \$ 781    | \$ 1,042  | \$ 1,557  | \$ 2,698  | \$ 1,642  |
| Avg. FAS             | \$ 0                               | \$ 22,761 | \$ 28,820 | \$ 31,438 | \$ 32,478 | \$ 37,162 | \$ 47,100 | \$ 38,115 |
| Number of Retirees   | 0                                  | 1         | 326       | 318       | 446       | 555       | 914       | 2,560     |

Average Age: 65.3  
Average Service: 25.3



**Members Who Died in the FY2021 Valuation Year  
With a Death-in-Service Allowance Payable**

| Central Age Group Beginning of Year | Number    |
|-------------------------------------|-----------|
| Under 25                            | 0         |
| 25                                  | 1         |
| 30                                  | 0         |
| 35                                  | 1         |
| 40                                  | 2         |
| 45                                  | 3         |
| 50                                  | 2         |
| 55                                  | 11        |
| 60                                  | 17        |
| 65                                  | 18        |
| 70 & Over                           | 9         |
| <b>Total</b>                        | <b>64</b> |

Average Age: 59.4  
Average Service: 17.3



**Members Who Died in the FY2021 Valuation Year  
and Received a Refund of Contributions**

| Central Age Group Beginning of Year | Number    |
|-------------------------------------|-----------|
| Under 25                            | 0         |
| 25                                  | 1         |
| 30                                  | 0         |
| 35                                  | 0         |
| 40                                  | 1         |
| 45                                  | 1         |
| 50                                  | 0         |
| 55                                  | 3         |
| 60                                  | 2         |
| 65                                  | 2         |
| 70 & Over                           | 4         |
| <b>Total</b>                        | <b>14</b> |

Average Age: 58.0  
Average Service: 4.8



**Members Who Became Disability Retirees  
During the FY2021 Valuation Year**

| <b>Central<br/>Age Group<br/>Beginning<br/>of Year</b> | <b>Number</b> |
|--|---------------|
| Under 25   | 0             |
| 25   | 0             |
| 30   | 1             |
| 35   | 2             |
| 40   | 4             |
| 45   | 6             |
| 50   | 27            |
| 55   | 55            |
| 60   | 88            |
| 65   | 23            |
| 70 & Over  | 3             |
| <b>Total</b>   | <b>209</b>    |

Average Age: 57.1  
Average Service: 18.1  
Average FAS: \$33,504



**Members Receiving a Refund of Contributions  
or Becoming Inactive Without a Refund in  
the FY2021 Valuation Year  
(Non-vested Terminations)**

| <b>Central<br/>Age Group<br/>Beginning<br/>of Year</b> | <b>Number</b> |
|--|---------------|
| Under 25   | 2,220         |
| 25   | 3,778         |
| 30   | 2,710         |
| 35   | 2,256         |
| 40   | 2,324         |
| 45   | 2,336         |
| 50   | 2,270         |
| 55   | 1,796         |
| 60   | 1,495         |
| 65   | 1,131         |
| 70 & Over  | 1,029         |
| <b>Total</b>   | <b>23,345</b> |

Average Age: 40.6

Average Service: 1.2



**Members Who Became Inactive  
in the FY2021 Valuation Year  
with a Deferred Allowance  
(Vested Terminations)**

| <b>Central<br/>Age Group<br/>Beginning<br/>of Year</b> | <b>Number</b> |
|--|---------------|
| Under 25   | 0             |
| 25   | 0             |
| 30   | 2             |
| 35   | 26            |
| 40   | 49            |
| 45   | 74            |
| 50   | 157           |
| 55   | 212           |
| 60   | 273           |
| 65   | 77            |
| 70 & Over  | 36            |
| <b>Total</b>   | <b>906</b>    |

Average Age: 55.0  
Average Service: 15.3



## **SCHEDULE G**

### **GLOSSARY**

**Actuarial Accrued Liability.** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability".

**Accrued Service.** The service credited under the plan which was rendered before the date of the actuarial valuation.

**Actuarial Assumptions.** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method".

**Actuarial Equivalent.** A series of payments is called an actuarial equivalent of another series of payments if the two series have the same actuarial present value.

**Actuarial Present Value.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

**Experience Gain (Loss).** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

**Normal Cost.** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Plan Termination Liability.** The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

**Reserve Account.** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

**Unfunded Actuarial Accrued Liability.** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability".

**Valuation Assets.** The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.



**APPENDIX A**  
**ACTUARIAL ACCRUED LIABILITIES**  
**AS OF JUNE 30, 2021**

| Present Value of:                                 | Pension Benefits        | Medicare Part B      | Post-Retirement Death Benefit | Total Basic Benefits    |
|---|-------------------------|----------------------|-------------------------------|-------------------------|
| Future benefits to present retirees and survivors | \$12,736,738,325        | \$217,208,538        | \$31,483,557                  | \$12,985,430,420        |
| Benefits and refunds to present inactive members  | 697,582,994             | 20,292,866           | 1,098,698                     | 718,974,558             |
| Allowances to present active members              |                         |                      |                               |                         |
| Service   | 7,130,252,984           | 137,713,793          | 7,616,764                     | 7,275,583,541           |
| Disability  | 250,271,688             | 3,898,347            | 339,590                       | 254,509,625             |
| Survivor benefits                                 | 168,812,510             | 3,004,139            | 0                             | 171,816,649             |
| Withdrawal  | <u>113,749,800</u>      | <u>9,270,922</u>     | <u>421,489</u>                | <u>123,442,211</u>      |
| Total Active AAL                                  | 7,663,086,982           | 153,887,201          | 8,377,843                     | 7,825,352,026           |
| Total AAL   | <u>\$21,097,408,301</u> | <u>\$391,388,605</u> | <u>\$40,960,098</u>           | <u>\$21,529,757,004</u> |





**APPENDIX B**

**BREAKDOWN OF TOTAL AND ACCRUED LIABILITIES  
AS OF JUNE 30, 2021**

|                                      | Total<br>Liability | Accrued<br>Liability  |
|--------------------------------------|--------------------|-----------------------|
| Active Members                       |                    |                       |
| Retirement                           | \$9,448,813,426    | \$7,130,252,984       |
| Death                                | 276,098,374        | 168,812,510           |
| Disability                           | 545,832,995        | 250,271,688           |
| Termination                          | 842,049,750        | 113,749,800           |
| Medicare Part B                      | 233,424,737        | 153,887,201           |
| Death after Retirement               | <u>13,064,470</u>  | <u>8,377,843</u>      |
| Total                                | \$11,359,283,752   | \$7,825,352,026       |
| Retirees                             |                    |                       |
| Retirement/Survivor/Disability       | \$12,736,738,325   | \$12,736,738,325      |
| Medicare Part B                      | 217,208,538        | 217,208,538           |
| Death after Retirement               | <u>31,483,557</u>  | <u>31,483,557</u>     |
| Total                                | \$12,985,430,420   | \$12,985,430,420      |
| Deferred Vested Members              | 360,165,488        | 360,165,488           |
| Inactive Members                     | <u>358,809,070</u> | <u>358,809,070</u>    |
| Total Actuarial Values               | \$25,063,688,730   | \$21,529,757,004      |
| Actuarial Value of Assets            |                    | <u>16,031,612,792</u> |
| Unfunded Actuarial Accrued Liability |                    | \$5,498,144,212       |



**APPENDIX C**

**COMPARATIVE SCHEDULE  
AS OF JUNE 30, 2021**

| Valuation<br>Date<br>June 30 | Active Members |                        |                |            | Retired Lives |                     |                 |              | Accrued<br>Liability | Valuation<br>Assets<br>\$ Millions | UAAL  |
|------------------------------|----------------|------------------------|----------------|------------|---------------|---------------------|-----------------|--------------|----------------------|------------------------------------|-------|
|                              | Number         | Payroll<br>\$ Millions | Average Salary |            | Number        |                     | Annual Benefits |              |                      |                                    |       |
|                              |                |                        | \$             | % Increase | Retired       | Active /<br>Retired | \$ Millions     | % of Payroll |                      |                                    |       |
| 2012                         | 121,811        | 2,788                  | 22,889         | 0.6        | 69,038        | 1.8                 | 838.1           | 30.1         | 16,755               | 10,397                             | 6,358 |
| 2013                         | 121,642        | 2,747                  | 22,581         | (1.3)      | 70,771        | 1.7                 | 898.3           | 32.7         | 17,247               | 11,126                             | 6,121 |
| 2014                         | 121,251        | 2,759                  | 22,757         | 0.8        | 72,605        | 1.7                 | 958.5           | 34.7         | 17,882               | 12,030                             | 5,851 |
| 2015                         | 122,855        | 2,845                  | 23,161         | 1.8        | 74,372        | 1.7                 | 1,020.4         | 35.9         | 18,503               | 12,602                             | 5,902 |
| 2016                         | 124,540        | 2,932                  | 23,545         | 1.7        | 76,280        | 1.6                 | 1,083.6         | 37.0         | 19,771               | 13,180                             | 6,591 |
| 2017                         | 157,981        | 3,303                  | 20,906         | (11.2)     | 79,157        | 2.0                 | 1,162.0         | 35.2         | 19,588               | 13,713                             | 5,875 |
| 2018                         | 158,343        | 3,332                  | 21,045         | 0.7        | 81,332        | 1.9                 | 1,211.9         | 36.4         | 19,998               | 14,012                             | 5,986 |
| 2019                         | 159,363        | 3,463                  | 21,727         | 3.2        | 81,024        | 2.0                 | 1,219.0         | 35.2         | 20,527               | 14,473                             | 6,054 |
| 2020                         | 156,579        | 3,478                  | 22,210         | 2.2        | 80,851        | 1.9                 | 1,234.3         | 35.5         | 21,034               | 15,037                             | 5,997 |
| 2021                         | 146,646        | 3,622                  | 24,700         | 11.2       | 80,721        | 1.8                 | 1,254.9         | 34.6         | 21,530               | 16,032                             | 5,498 |