



# State Universities Retirement System of Illinois

Actuarial Valuation Report as of  
June 30, 2021





October 29, 2021

Board of Trustees  
State Universities Retirement System of Illinois  
1901 Fox Drive  
Champaign, Illinois 61820

Dear Members of the Board:

At your request, we present the report of the actuarial valuation of the State Universities Retirement System of Illinois ("SURS") as of June 30, 2021. GRS has prepared this report exclusively for the Trustees of the State Universities Retirement System of Illinois; GRS is not responsible for reliance upon this report by any other party. This report may be provided to parties other than SURS only in its entirety and only with the permission of the Trustees.

This actuarial valuation provides information on the funding status and the contribution requirements of SURS. This actuarial valuation includes a determination of the statutory State contribution requirement (the "Statutory Contribution") for the fiscal year ending June 30, 2023, and provides estimates of Statutory contributions for subsequent years under Section 15-155 of the SURS Article of the Illinois Pension Code as amended by the provisions of Public Act ("PA") 100-0023 and 100-0587. SURS is currently not moving forward with the implementation of the Optional Hybrid Plan (OHP) created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so. Therefore, provisions related to the OHP are not reflected in this actuarial valuation. Under the provisions of PA 100-0023, employers make contributions beginning in fiscal year 2018 for current members who receive pay in excess of the Governor's pay and under PA 101-0010 (which rescinded the change to 3% from PA 100-0587), employers make contributions equal to the present value of the increase in benefit attributable to members who receive pay increases in excess of 6% during the final average salary (FAS) period. Information required by Governmental Accounting Standards Board ("GASB") Statement Nos. 67 and 68 is provided in a separate report. This report should not be relied on for any purpose other than the purpose described herein.

This actuarial valuation is based on the provisions of SURS in effect as of June 30, 2021, data on the SURS membership and information on the asset value of the trust fund as of that date. This actuarial valuation does not reflect the provisions of Public Act 98-0599 due to the court ruling that the changes in the Public Act were unconstitutional. The actuarial valuation was based upon the information furnished by SURS staff, concerning SURS benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by SURS.

The benefit provisions for members hired on or after January 1, 2011 were changed under Public Act 96-0889, which created a second tier of benefits for new members. Public Act 101-0610, effective January 1, 2020, added an unreduced retirement eligibility condition at age 60 with 20 years of service for Tier 2 police officers and firefighters. Effective September 1, 2020 the Retirement Savings Plan (RSP) has been renamed the Retirement Savings Plan (RSP).

The actuarial cost method (Projected Unit Credit, as required by statute) and the asset smoothing method (also as required by statute) used in this actuarial valuation are unchanged from the prior June 30, 2020 actuarial valuation of SURS. Economic and demographic actuarial assumptions were changed from the prior actuarial valuation based on recommendations from the experience study report covering the period June 30, 2017 through June 30, 2020. A summary of the changes can be found on page 4 of this report.

The actuarial assumptions were adopted by the Board pursuant to Section 15-155 of 40 ILCS 5 of the Illinois Pension Code. In our opinion, the actuarial assumptions are reasonable for the purpose of the measurement.

To the best of our knowledge, this actuarial statement is complete and accurate, fairly presents the actuarial position of SURS as of June 30, 2021, and has been prepared in accordance with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Future actuarial measurements may differ significantly from the current measurements 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, contribution amounts or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements in this report.

Actuarial valuations do not affect the ultimate cost of the Plan, only the timing of contributions into the Plan. Plan funding occurs over time. Contribution shortfalls (the difference between the actual contributions and the annual required contributions) remain the responsibility of the Plan sponsor and can be made in later years. If the contribution levels over a period of years are lower or higher than necessary, it is normal and expected practice for adjustments to be made to future contribution levels to take account of this variance, with a view to funding the plan over time.

Although prior year statutory contribution requirements were met, the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution.

Meeting the statutory requirement does not mean that the undersigned agree that adequate actuarial funding has been achieved; we recommend the development of and adherence to a funding policy that funds the normal cost of the plan as well as an amortization payment that would seek to pay off the total



unfunded accrued liability over a closed period of no less than 15 years and no more than the period of time in order to attain 100% funding by 2045 (23 years remaining in the actuarial valuation as of June 30, 2021, which calculates the fiscal year 2023 contribution).

This report was prepared using our proprietary valuation model and related software and spreadsheet models used to calculate the statutory contributions in each future year through 2045 under the SURS statutory funding policy. In our professional judgment, the models used have the capability to provide results that are consistent with the purposes of the valuation and have no material limitations or known weaknesses. We performed tests to ensure that the models reasonably represent that which is intended to be modeled.

This report reflects the impact of COVID-19 through June 30, 2021. However, this report does not reflect the longer term and still developing future impact of COVID-19, which is likely to further influence demographic experience and economic expectations. We will continue to monitor these developments and their impact on the System and the actuarial assumptions. Actual experience will be reflected in each subsequent annual valuation, as experience emerges.

The signing actuaries are independent of the plan sponsor.

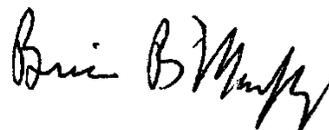
Amy Williams and Brian B. Murphy are Members of the American Academy of Actuaries (“MAAA”) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein.

Respectfully submitted,

Gabriel, Roeder, Smith & Company



Amy Williams, ASA, FCA, MAAA  
Senior Consultant



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD  
Senior Consultant

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## **SUMMARY OF THE ACTUARIAL VALUATION**

# Executive Summary

## (\$ in Millions)

| Actuarial Valuation Date:   | June 30, 2020       |                              | June 30, 2021       |                              |
|---|---------------------|------------------------------|---------------------|------------------------------|
| Fiscal Year Ending:   | June 30, 2022       |                              | June 30, 2023       |                              |
| Estimated Statutory Contribution:   |                     | % of<br>Payroll <sup>7</sup> |                     | % of<br>Payroll <sup>7</sup> |
| · Defined Benefit Plan Contribution Amount <sup>1</sup>                             | \$ 2,054.958        | 42.00%                       | \$ 2,070.405        | 41.46%                       |
| · Retirement Savings Plan Contribution Amount <sup>1</sup>                          | 87.059              | 1.78%                        | 90.469              | 1.81%                        |
| · Total Qualified Plan Contribution Amount  | <u>\$ 2,142.017</u> | 43.78%                       | <u>\$ 2,160.874</u> | 43.27%                       |
| · Excess Benefit Arrangement (EBA) Contribution Amount <sup>2</sup>                 | 21.500              | 0.44%                        | 24.200              | 0.48%                        |
| · Deferred Compensation Plan (DCP) Administrative Expense                           | 0.131               | 0.00%                        | 0.541               | 0.01%                        |
| · Combined State and Employer Contribution Amount                                   | <u>\$ 2,163.648</u> | 44.22%                       | <u>\$ 2,185.615</u> | 43.76%                       |
| Estimated Statutory Contribution from Other Sources:                                |                     |                              |                     |                              |
| · Federal/Trust Contribution Amount <sup>6</sup>                                    | \$ 57.000           |                              | \$ 62.000           |                              |
| · Employer Contribution Amount Related to<br>- Compensation in Excess of Governor's | \$ 5.369            |                              | \$ 5.048            |                              |
| Net State Contribution:   |                     |                              |                     |                              |
| · Net Dollar Amount (Including EBA Contribution)                                    | \$ 2,101.279        | 42.94%                       | \$ 2,118.567        | 42.42%                       |
| Actuarially Determined Contribution (ADC): <sup>3,4</sup>                           |                     |                              |                     |                              |
| · Defined Benefit Plan Contribution Amount  | \$ 2,458.736        | 50.25%                       | \$ 2,524.525        | 50.55%                       |
| · Defined Benefit Plan Contribution Amount as % of ADC                              | 83.58%              |                              | 82.01%              |                              |
| Membership  |                     |                              |                     |                              |
| · Number of   |                     |                              |                     |                              |
| - Active Members (full time and part time)  | 76,335              |                              | 73,443              |                              |
| - Members Receiving Payments <sup>3</sup>   | 69,172              |                              | 70,111              |                              |
| - Inactive Members  | 94,024              |                              | 96,753              |                              |
| - Total   | <u>239,531</u>      |                              | <u>240,307</u>      |                              |
| · Covered Capped Payroll Provided as of Valuation Date (Total)                      | \$ 4,583.907        |                              | \$ 4,639.067        |                              |
| · Covered Capped Payroll Provided as of Valuation Date (DB)                         | 3,527.958           |                              | 3,532.276           |                              |
| · Projected Capped Payroll for Fiscal Year (Total)                                  | 4,892.989           |                              | 4,994.329           |                              |
| · Defined Benefit Plan Capped Payroll <sup>5</sup>                                  | 3,642.617           |                              | 3,638.244           |                              |
| · Annualized Benefit Payments <sup>3</sup>  | 2,667.147           |                              | 2,758.151           |                              |

<sup>1</sup> RSP contributions are net of RSP forfeitures of \$5,672,000 for fiscal year 2022 and of \$7,175,000 for fiscal year 2023. Projected Retirement Savings Plan (RSP) contribution is updated based on the most recent actuarial valuation. Contribution amount for SURS defined benefit plans is the total qualified plan statutory contribution minus the RSP contribution.

<sup>2</sup> Amounts provided by SURS.

<sup>3</sup> Excludes RSP.

<sup>4</sup> 30-year initial closed period (23 years remaining as of June 30, 2021, applicable to the fiscal year 2023 contribution).

<sup>5</sup> Defined benefit payroll from the current actuarial valuation increased with one year of wage inflation.

<sup>6</sup> Pay increases in excess of 6% during FAS period for fiscal year 2022 and 2023 are included in the Federal/Trust Contribution Amount.

<sup>7</sup> Percent of projected capped payroll.



# Executive Summary

## (\$ in Millions)

| Actuarial Valuation Date:                          | June 30, 2020 | June 30, 2021 |
|--|---------------|---------------|
| Fiscal Year Ending:                                | June 30, 2022 | June 30, 2023 |
| Assets <sup>1</sup>                                |               |               |
| · Market Value of Assets (MVA)                     | \$ 19,617.016 | \$ 23,768.313 |
| · Actuarial Value of Assets (AVA)                  | 20,091.675    | 21,484.799    |
| · SURS Reported Market Value Rate of Return        | 2.64%         | 23.75%        |
| · Estimated Return on MVA                          | 2.80%         | 24.66%        |
| · Estimated Return on AVA                          | 5.54%         | 10.13%        |
| · Ratio – AVA to MVA                               | 102%          | 90%           |
| Actuarial Information <sup>2</sup>                 |               |               |
| · Total Normal Cost Rate                           | 20.33%        | 20.84%        |
| · Employer Normal Cost Rate                        | 12.32%        | 12.83%        |
| · Employer Normal Cost Amount                      | \$ 445.084    | \$ 468.901    |
| · Actuarial Accrued Liability (AAL)                | 47,580.470    | 48,898.480    |
| · Unfunded Actuarial Accrued Liability (UAAL)      | 27,488.795    | 27,413.681    |
| · Funded Ratio based on AVA                        | 42.23%        | 43.94%        |
| · UAAL as % of Defined Benefit Plan Capped Payroll | 754.64%       | 753.49%       |
| · Funded Ratio based on MVA                        | 41.23%        | 48.61%        |
| · Defined Benefit Plan Capped Payroll <sup>3</sup> | 3,642.617     | 3,638.244     |

<sup>1</sup> Amounts provided by SURS.

<sup>2</sup> Excludes RSP.

<sup>3</sup> Defined benefit payroll from the current actuarial valuation increased with one year of wage inflation.



# Summary of the Valuation

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## Purposes of the Actuarial Valuation

At your request we have performed an actuarial valuation of the State Universities Retirement System of Illinois (“SURS”) as of June 30, 2021.

The purposes of this actuarial valuation are as follows:

- To determine the funding status of SURS as of the valuation date based on the market value of assets and the actuarial value of assets; and
- To develop the level of contributions required under Section 15-155 of the SURS Article of the Illinois Pension Code as amended by the provisions of PA 100-0023 and PA 100-0587, (1) for the fiscal year ending June 30, 2023, and (2) to estimate contributions required under that Section for subsequent years of the funding period ending in the year 2045.

Accounting information required under Governmental Accounting Standards Board (“GASB”) Statement Nos. 67 and 68 is presented in a separate report.

## Report Highlights

The Statutory contribution (including the employer contribution and federal and trust fund contributions) for FY 2023 is \$2.186 billion (\$2.161 billion excluding the EBA contribution and the Deferred Compensation Plan (DCP) projected administrative expense) and includes the State’s projected FY 2023 normal cost of \$456.2 million, an unfunded liability contribution of \$1.615 billion, a contribution to fund benefits from the Excess Benefit Arrangement (“EBA”) of \$24.2 million, a contribution to fund the administrative expenses of the DCP of \$0.5 million and the Retirement Savings Plan (“RSP”) contribution of \$90.5 million. The 2020 actuarial valuation had projected the Statutory contribution would increase, from \$2.142 billion for FY 2022 to \$2.215 billion for FY 2023 (excluding EBA contributions). The primary reason for the decrease in the Statutory contribution over the projected amount from the prior actuarial valuation is due to very favorable investment experience. Non-investment plan experience and the changes in assumptions due to the experience study had a small impact on the Statutory contribution.

Over the past 10 years, SURS experienced investment gains on a market value basis (compared to the actuarial assumption) in fiscal years 2013, 2014, 2017, 2018 and 2021. However, SURS incurred investment losses (or shortfalls in return compared to the actuarial assumption) in fiscal years 2012, 2015, 2016, 2019 and 2020. The market return for the year ending June 30, 2021, was approximately 23.75% and was 2.64% in FY 2020. The average market value investment return over the most recent 10 years has been approximately 8.5%.

The funded ratio increased from 41.2% as of June 30, 2020, to 48.6% as of June 30, 2021, based on the market value of assets, and increased from 42.2% as of June 30, 2020, to 43.9% as of June 30, 2021, based on the actuarial value of assets. The approximately \$2.3 billion in net deferred asset gains will be recognized in the actuarial value of assets over the next four years.

The ratio of the market value of assets of the Defined Benefit Plan to the annual deductions (consisting of benefit payments, refunds of contributions and administrative expenses) and sometimes referred to as the liquidation ratio is about 8.3.



## Summary of the Valuation

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This means that approximately eight years of retiree benefit payments can be paid from current assets. The ability to make such payments beyond that period is heavily dependent upon future State and employer contributions and future investment return.

### Actuarial Assumptions

The asset valuation method was changed from market value of assets to actuarial value of assets effective with the actuarial valuation as of June 30, 2009, as required by statute.

All other assumptions were first adopted by the Board for use with the actuarial valuation as of June 30, 2021 and were based on the recommendations from the experience study review performed for the period from June 30, 2017 through June 30, 2020. The changes in assumptions include:

- Decreasing the investment return assumption from 6.75% to 6.50%;
- Decreasing the general wage inflation assumption from 3.25% to 3.00%;
- Modifying overall rates of salary increase and using a different salary increase assumption for people under age 50 and age 50 and older;
- Decreasing Effective Rate of Interest (“ERI”) assumption from 6.75% to 6.50%;
- Using different demographic assumptions based on position type of academic or non-academic;
  - Academic
    - Decreasing retirement rates;
    - Decreasing service-based termination rates;
    - Decreasing disability rates;
    - Increasing life expectancies for retirees younger than age 70;
  - Non-Academic
    - Increasing retirement rates;
    - Decreasing service-based termination rates;
    - Increasing disability rates;
    - Decreasing life expectancies;
- Updating plan election assumptions for future new hires.
  - Academic: 55% elect to participate in Tier 2, 45% elect to participate in the Retirement Savings Plan (RSP)
  - Non-Academic: 75% elect to participate in Tier 2, 25% elect to participate in the Retirement Savings Plan (RSP)

The assumption for members electing the accelerated pension benefit payment options is 0%. The rationale for this assumption can be found in a separate letter issued to the Board. Buyout election statistics can be found on page 68.

A complete description of the assumptions can be found in Appendix G of the report.

In addition, we have assumed that the Statutory contribution will be calculated as a level percentage of pensionable payroll. Pensionable payroll for members hired on or after January 1, 2011 is limited by the pay cap for Tier 2 members. The basis for this assumption comes from 40 ILCS 5/1-160 (b-5) for Tier 2.



# Summary of the Valuation

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## SURS Benefits

All benefit provisions valued in this June 30, 2021 actuarial valuation are identical to those valued in the prior actuarial valuation as of June 30, 2020. Due to the court ruling recent pension reform unconstitutional, this actuarial valuation does not reflect the provisions of Public Act 98-0599.

Public Act 100-0769 requires the SURS Board of Trustees, as soon as practicable after the effective date of the legislation, to establish and maintain a defined contribution plan. The defined contribution benefit must be an optional benefit to any member who chooses to participate. SURS has established the Deferred Compensation Plan (DCP).

Projected administrative expenses for this plan are included in the Statutory contribution. Other costs are not reflected in this valuation.

Effective September 1, 2020, the Self-Managed Plan (SMP) has been renamed the Retirement Savings Plan (RSP).

## Experience During 2021

The System assets earned approximately 23.75% on a market value basis during FY 2021 which was more than the investment return assumption of 6.75% for FY 2021. The System assets earned 10.13% on an actuarial value of assets basis during FY 2021, due to recognition of a portion of current year asset gains and prior year net deferred investment gains under the asset smoothing method. Because 10.13% is more than the assumed rate of investment return of 6.75% for FY 2021, there was an asset gain of \$668.9 million on the actuarial value of assets.

There was also a net gain of \$47.3 million from actuarial liabilities, which is comprised of a loss of approximately \$41.2 million from demographic experience, and a gain of \$88.5 million from lower than expected pay increases.

Changes in actuarial assumptions increased the actuarial liabilities by \$363.8 million.

The estimated reduction in the actuarial liabilities due to the buyouts during fiscal year 2021 is \$17.9 million.

The SURS defined benefit programs experienced an overall actuarial gain of \$716.2 million.

The experience of the population determines the liability gain or loss for the year. There was a loss on salaries, due to larger salary increases than assumed and a small loss from active member mortality experience. From last year to this year, there were losses from retirement, termination and retiree mortality experience and a gain from disabilities. The other assumptions not easily attributable to one of the other categories generated an actuarial gain.

See Table 10 (page 32), Appendix C, for detail of the gains and losses by source.



# Summary of the Valuation

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## Statutory Appropriations for the 2023 Fiscal Year and Beyond

Section 15-155, which governs the development of Employer/State contributions to SURS, provides that:

1. Employer/State contributions are determined under the following process:
  - a) The overall objective of the statute is to achieve a funded ratio of 90% by the end of fiscal year ("FY") 2045.
  - b) The Employer/State contribution for FY 2012 and each year thereafter to and including FY 2045 is to be based on a (theoretically) constant percentage of the payroll<sup>1</sup> of active members of SURS based on the actuarial value of assets at the actuarial valuation date and assuming the actuarial value of assets earns the assumed investment return in the future.

<sup>1</sup> We have assumed the contribution would be based on pensionable payroll. Pensionable payroll for members hired on or after January 1, 2011, is limited by the pay cap.

- i. Requires any change in an actuarial assumption that increases or decreases the required State contribution to be implemented in equal annual amounts over a five-year period beginning in the State fiscal year in which the change first applies to the required State contribution.
  - o For changes that first applied in FY 2014, FY 2015, FY 2016 or FY 2017, the impact is calculated based on a five-year period and the applicable portion is recognized during the remaining fiscal years in that five-year period.
- ii. Required the State to make additional contributions to SURS in FY 2018, FY 2019 and FY 2020 equal to 2% of the total payroll of each employee who participates in the Optional Hybrid Plan or who participates in the Tier 2 Plan in lieu of the Optional Hybrid Plan.
- iii. Requires employers to make contributions as follows:
  - o Requires employers to contribute the employer normal cost of the portion of an employee's earnings that exceeds the amount of salary set for the governor, for academic years beginning on or after July 1, 2017. (Applicable to Tier 1 and Tier 2 employees.)
  - o Requires employers to contribute for each employee of the employer who participates in the Optional Hybrid Plan or participates in the Tier 2 Plan in lieu of the Optional Hybrid Plan.
    - 1) The employer normal cost for Fiscal Years 2018, 2019 and 2020.
    - 2) The employer normal cost plus two percent of pay for Fiscal Years 2021 and thereafter.
    - 3) Beginning in FY 2018, the amount for that fiscal year to amortize any unfunded actuarial accrued liability attributable to the defined benefits of the employer's employees who first became participants on or after the implementation date of the Optional Hybrid Plan and the employer's employees who were previously Tier 2 participants but elected to participate in the Optional Hybrid Plan, determined as a level percentage of payroll over a 30-year rolling amortization period.



## Summary of the Valuation

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- 4) For academic years beginning on or after July 1, 2018, and for earnings paid under a contract or collective bargaining agreement entered into, amended or renewed on or after the effective date of the amendatory Act, if a participant's earnings for any academic year with the same employer as the previous academic year used to determine the final average salary increased by more than 3.00%, then the participant's employer shall pay the System the present value of the increase in benefits resulting from the portion of the increase in earnings that is in excess of 3.00%. Prior to the effective date of Public Act 100-0587, the payment from employers was for pay increases in excess of 6.00%.
- c) After 2045, the Employer/State contribution rate is to be sufficient to maintain the funding level at 90%.
  - o Employers continue to make the required normal cost and unfunded liability contributions.
  - o The financial impact of changes in actuarial assumptions continue to be phased in over a five-year period.
2. During the period of amortization of the 2003 bond issue, the Employer/State contribution in any fiscal year may not exceed the difference between:
  - a) The contribution, as developed in the preceding number 1., assuming that the special contribution (from the bond proceeds) has not been made, and
  - b) The debt service on the bond issue for the fiscal year.
3. Pursuant to Public Act 97-0694, Section 15-165, the dollar amount of the proposed Employer/State contribution required for a fiscal year shall be certified to the Governor no later than November 1 for the fiscal year commencing on the following July 1. The required amounts are budgeted pursuant to the continuing appropriations process. The State Actuary is required to review the actuarial assumptions and actuarial valuation and issue a preliminary report. After the Board considers the State Actuary's report, the certification is finalized no later than January 15.

SURS is currently not moving forward with the implementation of the Optional Hybrid Plan (OHP) created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so. Therefore, contributions related to the OHP are not included in the actuarial valuation, including contributions for employer normal cost, additional 2% of payroll contributions and unfunded liability contributions. Estimates of Statutory contributions through 2045, assuming that 55% of academic and 75% of non-academic future new members elect the Tier 2 Plan, 45% of academic and 25% of non-academic future new members elect RSP and all other actuarial assumptions are realized, are set out in Table 14 (page 39).

The Statutory contributions set out in this report represent the contribution amount determined consistent with the State Statute. The net State appropriation certified to the Governor is the total calculated in this report for the qualified plan, plus an estimated amount to fund the annual benefit payments payable from the Excess Benefit Arrangement (EBA), adjusted by contributions from federal and trust funds and employers. The estimated contributions from the federal and trust funds for FY 2023



## Summary of the Valuation

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is \$62,000,000, as estimated by SURS.

### Asset Information

Prior to the actuarial valuation as of June 30, 2009, the market value, without adjustment, was used for all actuarial purposes. Legislation in 2009 required that first effective for the actuarial valuation as of June 30, 2009, contribution projections would be calculated based on the actuarial value of assets. Funding status determinations and the contribution requirements were calculated based on the actuarial value of assets.

The market value of the assets of the System that is available for benefits increased from \$19,617.0 million as of June 30, 2020, to \$23,768.3 million as of June 30, 2021. The actuarial value of assets as of June 30, 2021, is \$21,484.8 million, which is \$2,283.5 million less than the market value of assets. This difference is due to the continuing recognition of deferred investment gains and losses. Twenty percent of these gains and losses are recognized each year. The \$2,283.5 million, which is the value of net deferred gains, will be smoothed into the actuarial value of assets over the next four years. The remaining unrecognized net asset gains from FY 2018 and FY 2021 will be smoothed in over the next one and four years, respectively, and the remaining asset losses from FY 2019 and FY 2020 will be smoothed in over the next two and three years, respectively.

The detailed determinations of asset values utilized in this valuation and asset growth in the last year are set out in Appendix A and Table 7 (page 29) of Appendix C.

### Funding Status

The funding status of SURS is measured by the Funded Ratio. The Funded Ratio is the ratio of the assets available for benefits compared to the actuarial accrued liability of the System. Thus, it reflects the portion of benefits earned to date by SURS members, which are covered by current System assets.

A funded ratio of 100% means that all of the benefits earned to date by SURS members are covered by assets. By monitoring changes in the funded ratio each year we can determine whether or not funding progress is being made.

As shown below, the SURS funded ratio increased from 41.2% as of June 30, 2020, to 48.6% as of June 30, 2021, based on the market value of assets, and increased from 42.2% as of June 30, 2020, to 43.9% as of June 30, 2021, based on the actuarial value of assets. There are net deferred gains that will be smoothed into the actuarial value of assets over the next four years. As a result of the approximately \$2.3 billion in net deferred gains and the funding policy, the funded ratio is projected to increase over the next four years if all assumptions are realized and all employer contributions are made on a timely basis.



## Summary of the Valuation

| Fiscal Year | Funded Ratio |        |
|-------------|--------------|--------|
|             | AVA          | MVA    |
| 2017        | 44.4 %       | 44.2 % |
| 2018        | 42.8         | 42.7   |
| 2019        | 42.3         | 42.5   |
| 2020        | 42.2         | 41.2   |
| 2021        | 43.9         | 48.6   |

### Short Condition Test

The following table shows a comparison, for fiscal years 2012 through 2021, of the percentage of benefits that are covered by the actuarial value of assets. The employer financed liabilities for current active and inactive members are 0% funded by the assets. Only a portion of the retiree liabilities are funded by current assets and the percentage covered increased from 40.9% as of June 30, 2020, to 43.5% as of June 30, 2021.

| Fiscal Year | Percentage of Benefits Covered by Net Assets<br>(in Millions) |                            |                            |                               |                                 |       |      |
|-------------|---|----------------------------|----------------------------|-------------------------------|---------------------------------|-------|------|
|             | Member Acc Contrib.   | Members Receiving Benefits | Act/Inact Employer Portion | Net Actuarial Value of Assets | % of Benefits Covered by Assets |       |      |
|             | (1)   | (2)                        | (3)                        |                               | (1)                             | (2)   | (3)  |
| 2012        | \$ 5,962.4  | \$ 20,651.4                | \$ 6,556.4                 | \$ 13,949.9                   | 100.0%                          | 38.7% | 0.0% |
| 2013        | 5,830.1   | 22,099.9                   | 6,443.1                    | 14,262.6                      | 100.0%                          | 38.2% | 0.0% |
| 2014        | 6,094.9   | 24,388.6                   | 6,946.0                    | 15,844.7                      | 100.0%                          | 40.0% | 0.0% |
| 2015        | 6,196.6   | 26,042.4                   | 7,281.7                    | 17,104.6                      | 100.0%                          | 41.9% | 0.0% |
| 2016        | 6,145.8   | 27,342.2                   | 7,435.3                    | 17,701.6                      | 100.0%                          | 42.3% | 0.0% |
| 2017        | 6,348.8   | 28,226.0                   | 7,278.6                    | 18,594.3                      | 100.0%                          | 43.4% | 0.0% |
| 2018        | 6,516.3   | 30,710.7                   | 8,031.7                    | 19,347.9                      | 100.0%                          | 41.8% | 0.0% |
| 2019        | 6,594.1   | 31,856.5                   | 7,993.4                    | 19,661.9                      | 100.0%                          | 41.0% | 0.0% |
| 2020        | 6,651.0   | 32,862.0                   | 8,067.5                    | 20,091.7                      | 100.0%                          | 40.9% | 0.0% |
| 2021        | 6,843.1   | 33,661.7                   | 8,393.6                    | 21,484.8                      | 100.0%                          | 43.5% | 0.0% |

### Actuarial Funding and Statutory Funding

Measuring the Statutory Contribution against a funding policy under which the sum of the normal cost and amortization of the unfunded accrued liability is contributed helps evaluate the funding adequacy of the current Statutory funding method. The rationale for contributions based on an accrual pattern of normal cost plus amortization of the unfunded liability is to have benefits accrued within the same generation that has earned them as well as to ensure that all benefit obligations will be met. Table 14 illustrates an “alternative policy contribution” which is the sum of the employer normal cost and an initial 30-year closed period (23 years remaining as of the actuarial valuation as of June 30, 2021, applicable to



## Summary of the Valuation

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the fiscal year 2023 contribution) level percentage of defined benefit plan capped payroll amortization payment. The alternative funding policy would require higher contributions in the near term compared to the Statutory funding policy. However, as shown in Graph 1 (page 35) and Graph 4 (page 40), the funded ratio would increase more quickly and require lower contributions than under the Statutory policy after approximately 12 years. The Statutory contributions are projected to continue to rise in order to meet the ultimate funding objective of a 90% funded ratio in 2045.

Based on projections assuming that the Statutory contributions are made every year (as shown in Table 12, page 34) and an investment return of 6.50% each year, the funded ratio is projected to begin to increase from about 44% funded to 90% funded at 2045. The funded ratio is not projected to exceed 60% until 2035, 70% until 2040 and is projected to increase to 90% during the five-year period from 2040 until 2045. If the Statutory contributions are not made or investment return is less than the assumption of 6.50%, the funded ratio will be lower and the cash flow strain will be higher. If another significant market downturn occurred while the System's funded ratio is low, the System could be required to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

The projected actuarial accrued liability of current retirees, current active and inactive members and future members is expected to increase from \$48.898 billion as of the end of FY 2021 to \$54.179 billion as of the end of FY 2033 and decrease to \$51.536 billion as of the end of FY 2045 (as shown in Graph 2, page 36, and Table 23, page 49). Total benefit payments are projected to increase from \$2.860 billion in fiscal year 2021 to \$4.229 billion in fiscal year 2045. Graph 3 (page 37, and Table 22, page 48) shows projected benefit payments separately for retirees as of June 30, 2021, active and inactive members as of June 30, 2021, and future members.

## Additional Projection Details

At the request of the State Actuary, we have included exhibits with additional projection details that can be found in Appendix E. The additional projections illustrate the impact on contributions and funded status if deferred asset gains and losses are not recognized.

## Recommendations

The calculations in this report were prepared based on the methods required by the Statutory funding policy including the asset smoothing method that was adopted for the first time in the June 30, 2009 actuarial valuation. GRS does not endorse this funding policy because the Statutory funding policy defers funding for these benefits into the future and places a higher burden on future generations of taxpayers.

We recommend the following changes:

1. Implementing a funding policy that contributes normal cost plus closed period amortization as a level percentage of defined benefit plan capped payroll of the unfunded liability. (Policy which recognizes unfunded liability at the valuation date and not projected liability in the year 2045.)
2. If the current Statutory funding policy is retained, we recommend:
  - a. Eliminating the maximum contribution cap;
  - b. Calculating contributions as a level percentage of defined benefit plan pensionable payroll



## Summary of the Valuation

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- only instead of total payroll (including RSP payroll)
- c. Eliminating smoothing of the change in the contribution requirement due to assumption changes.
  3. Implementing an asset corridor to constrain the actuarial value of assets within a certain percentage of the market value of assets (for example, 20 percent).
  4. Changing the actuarial cost method for calculating liabilities from the Projected Unit Credit to the Entry Age Normal method.
  5. Considering whether a decrease in total active membership is expected to continue, and if so, incorporating this into the projections used to calculate the Statutory contribution requirements.

### Change Funding Policy to a More Standard Actuarial Method

We recommend a funding policy that contributes normal cost plus closed period amortization as a level percentage of defined benefit plan capped payroll for paying off the current unfunded accrued liability (i.e., the amortization period declines by one year with each actuarial valuation) such that the funded ratio is projected to be 100 percent funded by 2045 or earlier. A 30-year closed amortization period (at the actuarial valuation as of June 30, 2014) methodology pays off the unfunded accrued liability in full by the end of the 30-year period in 2045. The Fiscal Year 2023 contribution would be \$2,614.994 (\$2,524.525 million for the SURS contribution and \$90.469 million for RSP) under this alternate funding policy. The current Statutory contribution does not comply with this recommendation. Because the alternate funding policy contribution is projected to decrease as deferred asset gains are recognized in the actuarial value of assets, it would be reasonable to smooth out the level of contributions over the next five years if funding were to occur based on the alternate funding policy. Underfunding the System creates the risk that ultimately benefit obligations cannot be met from the trust, and will require a greater amount of funding from other State resources. In addition, continually underfunding the System also creates more of a funding need from contributions since less is available from investment return – thereby creating a more expensive plan. Projected contributions under the current Statutory policy and the recommended policy are shown in Graph 4 on page 40 and projected funded ratios are shown in Graph 1 on page 35.

### Eliminate Maximum Contribution Cap

If the current statutory funding policy is not changed, we recommend that the provision that establishes a maximum contribution cap be eliminated. The contribution cap is based on the projected hypothetical contributions if the proceeds from the 2003 bond issue had not been received. The cap is projected to lower contributions during certain fiscal years 2023 through 2033 compared to if no maximum contribution methodology was in place.

### Calculate Defined Benefit Plan Contributions Based on Defined Benefit Payroll Only

Currently, the Statutory contributions to the SURS defined benefit plan are calculated based on a level percentage of total pensionable payroll, including RSP payroll. We recommend that the contributions be calculated as a level percentage of defined benefit plan pensionable payroll only.

### Implement an Asset Corridor

In addition, we recommend that an asset corridor on the actuarial value of assets be implemented, in case there is another significant market downturn similar to Fiscal Year 2009. The following table compares



## Summary of the Valuation

the ratio of the actuarial value of assets to the market value of assets since Fiscal Year 2009. Using an actuarial value of assets that is significantly higher than the market value of assets delays funding to the System by further deferring contributions into the future. The plan is already in serious funding jeopardy, and we cannot recommend an asset valuation method that does not include a corridor because it could add additional risk to the funding of the benefit obligations if another downturn occurred.

| (\$ in Millions) |                              |                           |                             |  |
|------------------|------------------------------|---------------------------|-----------------------------|--|
| Year             | Actuarial Value<br>of Assets | Market Value<br>of Assets | Ratio of<br>Actuarial Value |  |
| 2009             | \$ 14,281.998                | \$ 11,032.973             | 129 %                       |  |
| 2010             | 13,966.643                   | 12,121.542                | 115                         |  |
| 2011             | 13,945.680                   | 14,274.003                | 98                          |  |
| 2012             | 13,949.905                   | 13,705.143                | 102                         |  |
| 2013             | 14,262.621                   | 15,037.102                | 95                          |  |
| 2014             | 15,844.714                   | 17,391.323                | 91                          |  |
| 2015             | 17,104.607                   | 17,462.968                | 98                          |  |
| 2016             | 17,701.646                   | 17,005.630                | 104                         |  |
| 2017             | 18,594.326                   | 18,484.820                | 101                         |  |
| 2018             | 19,347.886                   | 19,321.076                | 100                         |  |
| 2019             | 19,661.891                   | 19,717.348                | 100                         |  |
| 2020             | 20,091.675                   | 19,617.016                | 102                         |  |
| 2021             | 21,484.799                   | 23,768.313                | 90                          |  |

### Change the Actuarial Cost Method to the Entry Age Normal Method

The current actuarial cost method is the Projected Unit Credit method, which is required by statute. The Projected Unit Credit method recognizes costs such that the normal cost for an individual member increases as a percentage of payroll throughout his/her career. The Entry Age Normal cost method is the most commonly used method in the public sector. It is also the method required to be used for financial reporting under GASB Statement Nos. 67 and 68. The Entry Age Normal method recognizes costs as a level percentage of payroll over a member's career. We recommend a change to the Entry Age Normal method. The actuarial accrued liability under the Entry Age Normal method is about \$1.2 billion higher as of the current actuarial valuation date than under the Projected Unit Credit method.

### Number of Projected Future Active Members

The statutory contribution is based on performing an open group projection through the year 2045. The projection is based on assuming that new active members are hired to replace the current members who leave active membership (through termination, retirement, death or disability). The number of active members has decreased by about 10 percent between 2011 and 2021, which is an average annualized decrease of about 1.0 percent.

Currently, the actuarial valuation assumes that the total number of active members in the future will be equal to the number of actives or active members in the current actuarial valuation. Given the decrease



## Summary of the Valuation

in the number of active members over the past 10 years, if SURS expects to continue to see a similar decline of the active population in the near term, the Board may want to consider an update to the population projection assumption to include a decreasing population in the near term before reaching an equilibrium number of active members long term.

| Total Active Members (Full and Part Time) |                        |        |        |                             |                               |                           |
|---|------------------------|--------|--------|-----------------------------|-------------------------------|---------------------------|
| June 30                                   | Traditional & Portable | RSP    | Total  | Annual Change in Membership | % Annual Change in Membership | Earnings (\$ in Millions) |
| 2011                                      | 71,888                 | 9,723  | 81,611 |                             |                               | \$3,893.4                 |
| 2012                                      | 71,056                 | 10,100 | 81,156 | (455)                       | -0.6%                         | 3,956.6                   |
| 2013                                      | 70,556                 | 10,746 | 81,302 | 146                         | 0.2%                          | 4,078.1                   |
| 2014                                      | 69,436                 | 11,409 | 80,845 | (457)                       | -0.6%                         | 4,131.0                   |
| 2015                                      | 69,381                 | 11,928 | 81,309 | 464                         | 0.6%                          | 4,280.5                   |
| 2016                                      | 66,245                 | 11,880 | 78,125 | (3,184)                     | -3.9%                         | 4,218.4                   |
| 2017                                      | 64,117                 | 11,852 | 75,969 | (2,156)                     | -2.8%                         | 4,184.5                   |
| 2018                                      | 62,844                 | 12,106 | 74,950 | (1,019)                     | -1.3%                         | 4,264.3                   |
| 2019                                      | 62,589                 | 12,531 | 75,120 | 170                         | 0.2%                          | 4,356.6                   |
| 2020                                      | 63,206                 | 13,129 | 76,335 | 1,215                       | 1.6%                          | 4,583.9                   |
| 2021                                      | 60,397                 | 13,046 | 73,443 | (2,892)                     | -3.8%                         | 4,639.1                   |
| Total Change                              |                        |        |        | (8,168)                     | -1.0%                         |                           |

**We recognize that the State Statute governs the funding policy of the System. The purpose of these comments is to highlight the difference between the Statutory appropriation methodology and the recommended actuarial funding policy and to highlight the risks and additional costs of continuing to underfund the System. We believe that the State Statute would allow the Board to change the assumption regarding the projected number of future active members.**

## GASB Disclosure

A separate actuarial valuation report with calculations completed in accordance with the provisions of GASB Statement Nos. 67 and 68 has been issued.

## Future Considerations

Changes (such as the phase-in of assumption changes, five-year asset smoothing and the addition of the new benefit tiers) have had the effect of reducing the Statutory contribution amounts that would have otherwise been made. However, the change in the investment return assumption and other changes to more closely align the actuarial assumptions with current market expectations have increased the contribution amounts that would otherwise have been made. Assuming the statutory contributions are received (and the actuarial assumptions are met including a 6.50% investment rate of return, each year through 2045), SURS is currently projected to have contributions sufficient to increase the funded ratio from the current level of 43.9% to 90.0% by 2045. However, policy makers should be aware that current capital market assumptions suggest that average future returns may be lower than 6.50% in the near term, and that a certain amount of erosion in the funding level may occur.



## Summary of the Valuation

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**This is a severely underfunded plan and the ability of the plan to reach 90% funding by 2045 is heavily dependent on the plan sponsor contributing the statutory contributions each and every year until 2045. We are not able to assess the plan sponsor's ability to make contributions when due.**

### Actuarial Standards of Practice (ASOP) 4 Disclosures

#### General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 6.50% on the actuarial value of assets), it is expected that:

1. The combined State and employer contribution rate will be level as a percentage of payroll through 2045 (after all assumption changes and deferred asset gains and losses are fully recognized);
2. The unfunded liability will decrease in dollar amount;
3. The unfunded actuarial accrued liabilities will never be fully amortized; and
4. The funded status of the plan will increase gradually towards a 90% funded ratio in 2045.

#### Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

1. The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring the obligations to a unrelated third party in an arm's length market value type transaction.
2. The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
3. The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets.

Limitation of Project Scope: Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.



## Summary of the Valuation

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### Risks Associated with Measuring the Accrued Liability and Contributions

The determination of the accrued liability and the statutory and actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the statutory and actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements 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 due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll or other relevant contribution factor;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.



## Summary of the Valuation

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The statutory contribution may be considered as a minimum contribution that complies with State statute. Contributions above this minimum level would enhance benefit security and improve the plan's funding level. The timely receipt of contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made in accordance with the funding policy do not necessarily guarantee benefit security.

### Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

|   | 2020  | 2021  |
|---|-------|-------|
| Ratio of the market value of assets to total payroll                  | 4.28  | 5.12  |
| Ratio of actuarial accrued liability to payroll                       | 10.38 | 10.54 |
| Ratio of actives to retirees and beneficiaries                        | 1.10  | 1.05  |
| Ratio of net non-investment cash flow to market value of assets       | -3.3% | -2.6% |
| Approximate modified duration of the present value of future benefits | 13.33 | 13.29 |

Payroll used in the above table includes RSP payroll.

### Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

### Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

# Summary of the Valuation

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## Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

## Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

## Duration of the Present Value of Future Benefits

The duration of the present value of future benefits may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

## Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

## Summary of the Valuation

### Risk Measures Summary (\$ in Millions)

|             | (1)         | (2)       | (3)       | (4)       | (5)     | (6)         | (7)       | (8)     | (9)      |
|-------------|-------------|-----------|-----------|-----------|---------|-------------|-----------|---------|----------|
|             |             |           | Market    |           | Market  |             |           |         |          |
|             | Accrued     | Market    | Value     | Valuation | Value   | Retiree     | RetLiab / | AAL /   | Assets / |
| Valuation   | Liabilities | Value of  | Unfunded  | Payroll   | Funded  | Liabilities | AAL       | Payroll | Payroll  |
| Date (6/30) | (AAL)       | Assets    | AAL       |           | Ratio   | (RetLiab)   | (6)/(1)   | (1)/(4) | (2)/(4)  |
|             |             |           |           |           | (2)/(1) |             |           |         |          |
| 2014        | \$ 37,430   | \$ 17,391 | \$ 20,038 | \$ 4,131  | 46.5%   | \$ 24,389   | 65.2%     | 906.1%  | 421.0%   |
| 2015        | 39,521      | 17,463    | 22,058    | 4,281     | 44.2%   | 26,042      | 65.9%     | 923.3%  | 408.0%   |
| 2016        | 40,923      | 17,006    | 23,918    | 4,218     | 41.6%   | 27,342      | 66.8%     | 970.1%  | 403.1%   |
| 2017        | 41,853      | 18,485    | 23,369    | 4,184     | 44.2%   | 28,226      | 67.4%     | 1000.2% | 441.7%   |
| 2018        | 45,259      | 19,321    | 25,938    | 4,264     | 42.7%   | 30,711      | 67.9%     | 1061.3% | 453.1%   |
| 2019        | 46,444      | 19,717    | 26,727    | 4,357     | 42.5%   | 31,857      | 68.6%     | 1066.1% | 452.6%   |
| 2020        | 47,580      | 19,617    | 27,963    | 4,584     | 41.2%   | 32,862      | 69.1%     | 1038.0% | 428.0%   |
| 2021        | 48,898      | 23,768    | 25,130    | 4,639     | 48.6%   | 33,662      | 68.8%     | 1054.1% | 512.4%   |

|             | (10)      | (11)      | (12)      | (13)       | (14)     | (15)    | (16)     |
|-------------|-----------|-----------|-----------|------------|----------|---------|----------|
|             |           |           |           | Non-       |          |         |          |
|             | Portfolio | Std Dev % | Unfunded  | Investment | NICF /   | Market  | 5-Year   |
| Valuation   | StdDev    | of Pay    | / Payroll | Cash Flow  | Assets   | Rate of | Trailing |
| Date (6/30) |           |           |           | (NICF)     | (13)/(2) | Return  | Average  |
|             |           |           |           |            |          |         |          |
| 2014        |           |           | 485.1%    | \$ (314)   | -1.8%    | 17.9%   | 0.0%     |
| 2015        |           |           | 515.3%    | (432)      | -2.5%    | 2.9%    | 13.6%    |
| 2016        |           |           | 567.0%    | (474)      | -2.8%    | 0.1%    | 11.1%    |
| 2017        |           |           | 558.5%    | (515)      | -2.8%    | 11.9%   | 6.5%     |
| 2018        |           |           | 608.3%    | (664)      | -3.4%    | 8.3%    | 8.9%     |
| 2019        |           |           | 613.5%    | (734)      | -3.7%    | 6.0%    | 8.0%     |
| 2020        | 10.9%     | 46.6%     | 610.0%    | (643)      | -3.3%    | 2.8%    | 5.8%     |
| 2021        | 11.9%     | 61.0%     | 541.7%    | (612)      | -2.6%    | 24.7%   | 10.5%    |

(5). The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(6) and (7). The ratio of Retiree liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system.

(8) and (9). The ratios of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(10) and (11). The portfolio standard deviation measures the volatility of investment return. When multiplied by the ratio of assets to payroll it gives the effect of a one standard deviation asset move as



## Summary of the Valuation

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a percent of payroll. This figure helps users understand the difficulty of dealing with investment volatility and the challenges volatility brings to sustainability. This ratio is likely to increase as the plan approaches full funding which is expected to lead to increasing volatility of contribution rates.

- (12). The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.
- (13) and (14). The ratio of Non-Investment Cash Flow to assets is an important measure of sustainability. A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.
- (15) and (16). Investment return is probably the largest single risk that most systems face. The year-by-year return and the 5-year geometric average both give an indication of the reasonableness of the system's assumed return. Of course, past performance is not a guarantee of future results. Market rate shown is based on actuarial estimation method and differs modestly from figures reported by State Street.

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## **APPENDICES**

## **APPENDIX A**

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### **ASSET INFORMATION**

# Table 1

## Statement of Plan Net Position

### as of June 30, 2021 and June 30, 2020

|  | Defined Benefit Plan |                   |
|--|----------------------|-------------------|
|  | 2021                 | 2020              |
| Assets                                       |                      |                   |
| Cash and short-term investments              | \$ 1,709,596,995     | \$ 1,266,766,677  |
| Receivables                                  |                      |                   |
| Members                                      | 10,614,296           | 11,158,593        |
| Non-employer contributing entity             |                      | 116,889,698       |
| Federal, trust funds, and other              | 7,179,061            | 6,687,733         |
| Pending investment sales                     | 78,168,602           | 1,952,064,461     |
| Interest and dividends                       | 59,913,180           | 47,440,102        |
| Total receivables                            | 155,875,139          | 2,134,240,587     |
| Prepaid expenses                             | 140,576              | 133,923           |
| Investments, at fair value                   |                      |                   |
| Equity investments                           | 9,997,064,955        | 6,684,436,960     |
| Fixed income investments                     | 6,316,264,651        | 5,467,304,396     |
| Real estate investments                      | 1,550,843,437        | 1,124,007,562     |
| Alternative investments                      | 4,198,134,475        | 4,977,446,278     |
| Total investments                            | 22,062,307,518       | 18,253,195,196    |
| Securities lending collateral                | 2,128,804,290        | 1,381,940,165     |
| Capital assets, at cost, net of accum deprec | 11,092,315           | 10,388,424        |
| Total assets                                 | 26,067,816,833       | 23,046,664,972    |
| Liabilities                                  |                      |                   |
| Benefits payable                             | 17,463,444           | 12,718,437        |
| Refunds payable                              | 5,318,074            | 3,601,916         |
| Securities lending collateral                | 2,128,207,416        | 1,381,486,080     |
| Payable to brokers for unsettled trades      | 127,159,288          | 2,013,885,643     |
| Reverse repurchase agreements                | 619,964              | 512,000           |
| Investment expenses payable                  | 14,918,233           | 8,041,750         |
| Administrative expenses payable              | 5,817,154            | 9,403,540         |
| Total liabilities                            | 2,299,503,573        | 3,429,649,366     |
| Plan Net Position                            | \$ 23,768,313,260    | \$ 19,617,015,606 |



## Table 2

### Statement of Changes in Plan Net Position for Years Ended June 30, 2021 and June 30, 2020

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|                                  | Defined Benefit Plan |                   |
|----------------------------------|----------------------|-------------------|
|                                  | 2021                 | 2020              |
| Additions                        |                      |                   |
| Contributions                    |                      |                   |
| Employer                         | \$ 57,001,310        | \$ 52,968,295     |
| Non-employer contributing entity | 1,921,742,123        | 1,785,817,785     |
| Member                           | 288,476,321          | 282,367,290       |
| Total Contributions              | 2,267,219,754        | 2,121,153,370     |
| Investment Income                |                      |                   |
| Net appreciation                 |                      |                   |
| in fair value of investments     | 4,458,726,101        | 213,670,350       |
| Interest                         | 198,062,417          | 191,342,519       |
| Dividends                        | 186,062,862          | 200,038,867       |
| Securities lending               | 6,300,112            | 5,597,401         |
| Gross Investment Income          | 4,849,151,492        | 610,649,137       |
| Less investment expense          |                      |                   |
| Asset management expense         | 85,614,897           | 67,967,190        |
| Securities lending expense       | 567,010              | 504,180           |
| Net investment income            | 4,762,969,585        | 542,177,767       |
| Total additions                  | 7,030,189,339        | 2,663,331,137     |
| Deductions                       |                      |                   |
| Benefits                         | 2,780,374,481        | 2,676,192,703     |
| Refunds of contributions         | 79,128,037           | 69,001,514        |
| Administrative expense           | 19,389,167           | 18,469,275        |
| Total deductions                 | 2,878,891,685        | 2,763,663,492     |
| Net increase (decrease)          | 4,151,297,654        | (100,332,355)     |
| Plan Net Position                |                      |                   |
| Beginning of year                | 19,617,015,606       | 19,717,347,961    |
| Plan Net Position                |                      |                   |
| End of year                      | \$ 23,768,313,260    | \$ 19,617,015,606 |

## **APPENDIX B**

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### **MEMBERSHIP DATA**

## Table 3A

### Summary of Data Characteristics – Active, Inactive, Retired (\$ in Millions)

|                              | June 30, 2020 |           | June 30, 2021 |           |
|------------------------------|---------------|-----------|---------------|-----------|
|                              | Number        | Earnings  | Number        | Earnings  |
| <b>Active Members</b>        |               |           |               |           |
| Full time                    |               |           |               |           |
| Traditional SURS             | 42,143        | \$2,298.1 | 40,399        | \$2,292.1 |
| Portable SURS                | 17,446        | 1,203.8   | 17,198        | 1,217.8   |
| RSP                          | 12,726        | 1,052.2   | 12,669        | 1,103.0   |
| Total Full Time <sup>1</sup> | 72,315        | \$4,554.1 | 70,266        | \$4,612.9 |
| Part time                    |               |           |               |           |
| Traditional SURS             | 3,133         | \$ 21.9   | 2,385         | \$ 18.6   |
| Portable SURS                | 484           | 4.2       | 415           | 3.8       |
| RSP                          | 403           | 3.7       | 377           | 3.8       |
| Total Part Time              | 4,020         | \$ 29.8   | 3,177         | \$ 26.2   |
| Total                        | 76,335        | \$4,583.9 | 73,443        | \$4,639.1 |
| <b>Inactive Members</b>      |               |           |               |           |
| Traditional SURS             | 70,630        |           | 72,539        |           |
| Portable SURS                | 13,114        |           | 13,596        |           |
| RSP                          | 10,280        |           | 10,618        |           |
| Total                        | 94,024        |           | 96,753        |           |

<sup>1</sup> Includes 678 police officers and firefighters (including RSP) as of June 30, 2020, and 669 as of June 30, 2021.

|                           | June 30, 2020 |                 | June 30, 2021 |                 |
|---------------------------|---------------|-----------------|---------------|-----------------|
|                           | Number        | Annual Benefits | Number        | Annual Benefits |
| <b>Benefit Recipients</b> |               |                 |               |                 |
| Retirement                |               |                 |               |                 |
| Traditional SURS          | 51,534        | \$ 2,174.4      | 51,860        | \$ 2,226.3      |
| Portable SURS             | 7,526         | 274.8           | 8,012         | 302.2           |
| Total Retirement          | 59,060        | \$ 2,449.2      | 59,872        | \$ 2,528.5      |
| Survivor                  |               |                 |               |                 |
| Traditional SURS          | 8,874         | \$ 189.9        | 9,022         | \$ 201.4        |
| Portable SURS             | 283           | 5.8             | 310           | 6.6             |
| Total Survivor            | 9,157         | \$ 195.7        | 9,332         | \$ 208.0        |
| Disability                |               |                 |               |                 |
| Traditional SURS          | 779           | \$ 17.5         | 734           | \$ 16.8         |
| Portable SURS             | 176           | 4.8             | 173           | 4.9             |
| Total Disability          | 955           | \$ 22.3         | 907           | \$ 21.7         |
| Total                     | 69,172        | \$ 2,667.1      | 70,111        | \$ 2,758.2      |
| <b>Total Participants</b> |               |                 |               |                 |
| Total Traditional SURS    | 177,093       |                 | 176,939       |                 |
| Total Portable SURS       | 39,029        |                 | 39,704        |                 |
| Total RSP                 | 23,409        |                 | 23,664        |                 |
| Total                     | 239,531       |                 | 240,307       |                 |

Values may not add due to rounding.



## Table 3B

### Summary of Data Characteristics – Full Time Active

(\$ in Millions)

|  | June 30, 2020 |            | June 30, 2021 |            |
|--|---------------|------------|---------------|------------|
|  | Number        | Earnings   | Number        | Earnings   |
| <b>Active Members</b>  |               |            |               |            |
| Full time  |               |            |               |            |
| Continuing Full Time Actives and Full Time Actives from Inactive and Part Time status - Tier 1 |               |            |               |            |
| Traditional SURS   | 24,231        | \$ 1,559.0 | 22,274        | \$ 1,488.5 |
| Portable SURS  | 9,408         | 759.4      | 8,689         | 727.8      |
| RSP  | 5,254         | 464.8      | 4,916         | 455.9      |
| Total  | 38,893        | \$ 2,783.2 | 35,879        | \$ 2,672.2 |
| Continuing Full Time Actives and Full Time Actives from Inactive and Part Time status - Tier 2 |               |            |               |            |
| Traditional SURS   | 14,065        | \$ 641.2   | 15,462        | \$ 735.7   |
| Portable SURS  | 6,724         | 395.5      | 7,408         | 449.3      |
| RSP  | 6,193         | 512.5      | 6,903         | 595.7      |
| Total  | 26,982        | \$ 1,549.3 | 29,773        | \$ 1,780.7 |
| New Actives - Tier 1   |               |            |               |            |
| Traditional SURS   | 378           | \$ 10.3    | 216           | \$ 6.3     |
| Portable SURS  | 79            | 3.1        | 63            | 2.5        |
| RSP  | 50            | 2.1        | 26            | 1.1        |
| Total  | 507           | \$ 15.5    | 305           | \$ 9.9     |
| New Actives - Tier 2   |               |            |               |            |
| Traditional SURS   | 3,469         | \$ 87.6    | 2,447         | \$ 61.5    |
| Portable SURS  | 1,235         | 45.7       | 1,038         | 38.3       |
| RSP  | 1,229         | 72.8       | 824           | 50.3       |
| Total  | 5,933         | \$ 206.1   | 4,309         | \$ 150.1   |
| Total Actives - Tier 1   |               |            |               |            |
| Traditional SURS   | 24,609        | \$ 1,569.3 | 22,490        | \$ 1,494.8 |
| Portable SURS  | 9,487         | 762.5      | 8,752         | 730.3      |
| RSP  | 5,304         | 467.0      | 4,942         | 457.0      |
| Total  | 39,400        | \$ 2,798.8 | 36,184        | \$ 2,682.1 |
| Total Actives - Tier 2   |               |            |               |            |
| Traditional SURS   | 17,534        | \$ 728.8   | 17,909        | \$ 797.2   |
| Portable SURS  | 7,959         | 441.3      | 8,446         | 487.6      |
| RSP  | 7,422         | 585.3      | 7,727         | 646.0      |
| Total  | 32,915        | \$ 1,755.3 | 34,082        | \$ 1,930.8 |
| Total Actives - Tier 1 and Tier 2  |               |            |               |            |
| Traditional SURS   | 42,143        | \$ 2,298.1 | 40,399        | \$ 2,292.1 |
| Portable SURS  | 17,446        | 1,203.8    | 17,198        | 1,217.8    |
| RSP  | 12,726        | 1,052.2    | 12,669        | 1,103.0    |
| Total  | 72,315        | \$ 4,554.1 | 70,266        | \$ 4,612.9 |

Values may not add due to rounding.



**Table 3C**  
**Summary of Data Characteristics – Part Time Active/Inactive**  
**(\$ in Millions)**

|                                     | June 30, 2020 |          | June 30, 2021 |          |
|-------------------------------------|---------------|----------|---------------|----------|
|                                     | Number        | Earnings | Number        | Earnings |
| <b>Active Members</b>               |               |          |               |          |
| Part time                           |               |          |               |          |
| Total Actives - Tier 1              |               |          |               |          |
| Traditional SURS                    | 826           | \$ 5.5   | 563           | \$ 3.9   |
| Portable SURS                       | 152           | 1.0      | 106           | 0.8      |
| RSP                                 | 79            | 0.6      | 56            | 0.4      |
| Total                               | 1,057         | \$ 7.1   | 725           | \$ 5.1   |
| Total Actives - Tier 2              |               |          |               |          |
| Traditional SURS                    | 2,307         | \$ 16.4  | 1,822         | \$ 14.7  |
| Portable SURS                       | 332           | 3.2      | 309           | 3.0      |
| RSP                                 | 324           | 3.1      | 321           | 3.3      |
| Total                               | 2,963         | \$ 22.7  | 2,452         | \$ 21.0  |
| Total Actives - Tier 1 and Tier 2   |               |          |               |          |
| Traditional SURS                    | 3,133         | \$ 21.9  | 2,385         | \$ 18.6  |
| Portable SURS                       | 484           | 4.2      | 415           | 3.8      |
| RSP                                 | 403           | 3.7      | 377           | 3.8      |
| Total                               | 4,020         | \$ 29.8  | 3,177         | \$ 26.2  |
| <b>Inactive Members</b>             |               |          |               |          |
| Total Inactives - Tier 1            |               |          |               |          |
| Traditional SURS                    | 54,916        |          | 54,500        |          |
| Portable SURS                       | 9,025         |          | 8,991         |          |
| RSP                                 | 6,926         |          | 6,879         |          |
| Total                               | 70,867        |          | 70,370        |          |
| Total Inactives - Tier 2            |               |          |               |          |
| Traditional SURS                    | 15,714        |          | 18,039        |          |
| Portable SURS                       | 4,089         |          | 4,605         |          |
| RSP                                 | 3,354         |          | 3,739         |          |
| Total                               | 23,157        |          | 26,383        |          |
| Total Inactives - Tier 1 and Tier 2 |               |          |               |          |
| Traditional SURS                    | 70,630        |          | 72,539        |          |
| Portable SURS                       | 13,114        |          | 13,596        |          |
| RSP                                 | 10,280        |          | 10,618        |          |
| Total                               | 94,024        |          | 96,753        |          |

Values may not add due to rounding.



## Table 3D

### Summary of Data Characteristics – Academic/Non-Academic (\$ in Millions)

|                           | June 30, 2020  |                       |                |                       | June 30, 2021  |                       |                |                       |
|---------------------------|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|
|                           | Academic       |                       | Non-Academic   |                       | Academic       |                       | Non-Academic   |                       |
|                           | Number         | Earnings              | Number         | Earnings              | Number         | Earnings              | Number         | Earnings              |
| <b>Full time</b>          |                |                       |                |                       |                |                       |                |                       |
| Traditional SURS          | 14,370         | \$ 850.8              | 27,773         | \$ 1,432.1            | 13,489         | \$ 850.8              | 26,910         | \$ 1,441.3            |
| Portable SURS             | 6,216          | 522.2                 | 11,230         | 681.1                 | 6,012          | 522.2                 | 11,186         | 695.6                 |
| RSP                       | 5,558          | 573.9                 | 7,168          | 499.3                 | 5,455          | 573.9                 | 7,214          | 529.1                 |
| <b>Total</b>              | <b>26,144</b>  | <b>\$ 1,946.9</b>     | <b>46,171</b>  | <b>\$ 2,612.6</b>     | <b>24,956</b>  | <b>\$ 1,946.9</b>     | <b>45,310</b>  | <b>\$ 2,666.0</b>     |
| <b>Part time</b>          |                |                       |                |                       |                |                       |                |                       |
| Traditional SURS          | 2,470          | \$ 850.8              | 663            | \$ 5.1                | 1,901          | \$ 14.5               | 484            | \$ 4.1                |
| Portable SURS             | 395            | 522.2                 | 89             | 0.9                   | 340            | 3.1                   | 75             | 0.7                   |
| RSP                       | 347            | 573.9                 | 56             | 0.6                   | 328            | 3.3                   | 49             | 0.5                   |
| <b>Total</b>              | <b>3,212</b>   | <b>\$ 1,946.9</b>     | <b>808</b>     | <b>\$ 6.6</b>         | <b>2,569</b>   | <b>\$ 20.9</b>        | <b>608</b>     | <b>\$ 5.3</b>         |
| <b>Inactive</b>           |                |                       |                |                       |                |                       |                |                       |
| Traditional SURS          | 37,648         |                       | 32,982         |                       | 38,355         |                       | 34,184         |                       |
| Portable SURS             | 6,146          |                       | 6,968          |                       | 6,288          |                       | 7,308          |                       |
| RSP                       | 5,733          |                       | 4,547          |                       | 5,837          |                       | 4,781          |                       |
| <b>Total</b>              | <b>49,527</b>  |                       | <b>44,497</b>  |                       | <b>50,480</b>  |                       | <b>46,273</b>  |                       |
|                           | <b>Number</b>  | <b>Annual Benefit</b> |
| <b>Benefit Recipients</b> |                |                       |                |                       |                |                       |                |                       |
| Traditional SURS          | 27,519         | \$ 1,302.2            | 33,668         | \$ 1,079.6            | 27,659         | \$ 1,326.0            | 33,957         | \$ 1,118.5            |
| Portable SURS             | 3,449          | 141.3                 | 4,536          | 144.0                 | 3,662          | 155.1                 | 4,833          | 158.6                 |
| <b>Total</b>              | <b>30,968</b>  | <b>1,443.5</b>        | <b>38,204</b>  | <b>1,223.7</b>        | <b>31,321</b>  | <b>1,481.1</b>        | <b>38,790</b>  | <b>1,277.1</b>        |
| <b>Total Participants</b> |                |                       |                |                       |                |                       |                |                       |
| Total Traditional SURS    | 82,007         |                       | 95,086         |                       | 81,404         |                       | 95,535         |                       |
| Total Portable SURS       | 16,206         |                       | 22,823         |                       | 16,302         |                       | 23,402         |                       |
| Total RSP                 | 11,638         |                       | 11,771         |                       | 11,620         |                       | 12,044         |                       |
| <b>Total</b>              | <b>109,851</b> |                       | <b>129,680</b> |                       | <b>109,326</b> |                       | <b>130,981</b> |                       |

Values may not add due to rounding.



**Table 4**  
**Distribution of Full-Time Active Members by Age and Years of Service**  
**as of June 30, 2021**

| Age           | Years of Service |                  |                |                |                |                |                |                |      | Totals           |
|---------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|------|------------------|
|               | Under 1          | 1-4              | 5-9            | 10-14          | 15-19          | 20-24          | 25-29          | 30 & Over      |      |                  |
| Under 20      | 9                | 6                | -              | -              | -              | -              | -              | -              | -    | 15               |
|               | \$ 50,998        | \$ 103,157       | \$ -           | \$ -           | \$ -           | \$ -           | \$ -           | \$ -           | \$ - | \$ 154,155       |
| 20-24         | 321              | 694              | 21             | -              | -              | -              | -              | -              | -    | 1,036            |
|               | \$ 3,295,294     | \$ 21,208,709    | \$ 776,354     | \$ -           | \$ -           | \$ -           | \$ -           | \$ -           | \$ - | \$ 25,280,357    |
| 25-29         | 513              | 3,403            | 519            | 3              | -              | -              | -              | -              | -    | 4,438            |
|               | \$ 6,884,444     | \$ 150,207,180   | \$ 23,618,487  | \$ 136,224     | \$ -           | \$ -           | \$ -           | \$ -           | \$ - | \$ 180,846,335   |
| 30-34         | 514              | 4,218            | 2,206          | 351            | 11             | -              | -              | -              | -    | 7,300            |
|               | \$ 9,609,364     | \$ 235,810,403   | \$ 123,048,973 | \$ 20,054,826  | \$ 649,304     | \$ -           | \$ -           | \$ -           | \$ - | \$ 389,172,869   |
| 35-39         | 361              | 3,411            | 2,932          | 1,599          | 414            | 24             | -              | -              | -    | 8,741            |
|               | \$ 6,805,814     | \$ 212,497,151   | \$ 191,729,908 | \$ 105,221,190 | \$ 27,026,175  | \$ 1,331,171   | \$ -           | \$ -           | \$ - | \$ 544,611,409   |
| 40-44         | 234              | 2,483            | 2,686          | 2,000          | 1,367          | 445            | 16             | -              | -    | 9,231            |
|               | \$ 4,587,768     | \$ 150,037,468   | \$ 184,040,069 | \$ 148,367,967 | \$ 106,136,161 | \$ 31,585,455  | \$ 1,084,642   | \$ -           | \$ - | \$ 625,839,529   |
| 45-49         | 206              | 1,912            | 2,021          | 1,742          | 1,678          | 1,226          | 314            | 7              | -    | 9,106            |
|               | \$ 4,107,878     | \$ 111,798,779   | \$ 128,181,788 | \$ 138,417,476 | \$ 145,136,161 | \$ 100,944,153 | \$ 24,504,639  | \$ 457,243     | \$ - | \$ 653,548,116   |
| 50-54         | 182              | 1,649            | 1,864          | 1,561          | 1,755          | 1,627          | 842            | 200            | -    | 9,680            |
|               | \$ 3,952,514     | \$ 90,848,703    | \$ 112,124,008 | \$ 110,589,254 | \$ 148,413,604 | \$ 144,407,984 | \$ 74,288,875  | \$ 16,257,802  | \$ - | \$ 700,882,744   |
| 55-59         | 135              | 1,294            | 1,608          | 1,366          | 1,486          | 1,571          | 887            | 424            | -    | 8,771            |
|               | \$ 2,978,161     | \$ 73,251,184    | \$ 92,000,587  | \$ 92,331,110  | \$ 117,401,278 | \$ 138,974,089 | \$ 86,237,264  | \$ 42,774,408  | \$ - | \$ 645,948,082   |
| 60-64         | 63               | 820              | 1,241          | 1,080          | 1,174          | 1,128          | 665            | 509            | -    | 6,680            |
|               | \$ 1,408,214     | \$ 45,139,062    | \$ 67,538,960  | \$ 68,777,924  | \$ 86,251,941  | \$ 92,194,374  | \$ 66,115,781  | \$ 61,183,713  | \$ - | \$ 488,609,969   |
| 65 & Over     | 19               | 539              | 975            | 886            | 894            | 863            | 497            | 595            | -    | 5,268            |
|               | \$ 439,817       | \$ 24,350,639    | \$ 44,506,114  | \$ 48,195,985  | \$ 58,975,393  | \$ 67,538,123  | \$ 43,359,548  | \$ 70,649,324  | \$ - | \$ 358,014,943   |
| Total Count   | 2,557            | 20,429           | 16,073         | 10,588         | 8,779          | 6,884          | 3,221          | 1,735          | -    | 70,266           |
| Total Payroll | \$ 44,120,265    | \$ 1,115,252,434 | \$ 967,565,248 | \$ 732,091,955 | \$ 689,990,017 | \$ 576,975,349 | \$ 295,590,748 | \$ 191,322,491 | \$ - | \$ 4,612,908,507 |

*Includes the use of capped payroll for defined benefit plan members hired on or after January 1, 2011. Includes RSP.*



**Table 5**  
**Distribution of Benefit Recipients by Age**  
**as of June 30, 2021**

| <u>Age</u>                    | <u>Number</u> | <u>Annual Benefit</u> |
|-------------------------------|---------------|-----------------------|
| <b>Retirees and Survivors</b> |               |                       |
| Under 50                      | 409           | \$ 3,423,895          |
| 50-54                         | 399           | 14,998,066            |
| 55-59                         | 3,141         | 107,618,260           |
| 60-64                         | 8,044         | 297,852,923           |
| 65-69                         | 13,683        | 515,248,614           |
| 70-74                         | 15,912        | 619,895,227           |
| 75-79                         | 11,691        | 515,570,213           |
| 80-84                         | 7,909         | 349,982,030           |
| 85-89                         | 4,807         | 201,308,627           |
| 90 & Over                     | <u>3,209</u>  | <u>110,589,838</u>    |
| Total                         | 69,204        | \$ 2,736,487,693      |
| <b>Disabilitants</b>          |               |                       |
| Under 50                      | 117           | \$ 2,969,487          |
| 50-54                         | 93            | 2,314,771             |
| 55-59                         | 178           | 4,729,922             |
| 60-64                         | 200           | 4,990,607             |
| 65-69                         | 171           | 3,827,265             |
| 70-74                         | 81            | 1,652,615             |
| 75-79                         | 31            | 474,144               |
| 80-84                         | 23            | 513,163               |
| 85-89                         | 7             | 78,723                |
| 90 & Over                     | <u>6</u>      | <u>113,041</u>        |
| Total                         | 907           | \$ 21,663,738         |

*Excludes RSP.*



## **APPENDIX C**

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### **ACTUARIAL DETERMINATIONS**

**Table 6**  
**Summary of Actuarial Values**  
**as of June 30, 2021**  
(\$ in Millions)

|   | Actuarial<br>Present Value<br>of Projected<br>Benefits (APV) | Projected Unit Credit Values               |  | Gross<br>NC %<br>of Pay <sup>1</sup> |
|---|--|--|--|--------------------------------------|
|   |  | Actuarial<br>Accrued<br>Liability<br>(AAL) | Gross<br>Normal<br>Cost<br>(NC) <sup>1</sup> |                                      |
| <b>1. Active Members</b>  |  |  |  |                                      |
| a. Retirement   | \$16,120.2   | \$ 10,711.2                                | \$584.1                                      | 15.91%                               |
| b. Death  | 237.6  | 150.6                                      | 10.0   | 0.27%                                |
| c. Disability   | 253.9  | 146.1                                      | 15.8   | 0.43%                                |
| d. Termination  | 1,888.6  | 1,147.3                                    | 131.9  | 3.59%                                |
| Total - Active Members  | \$18,500.3   | \$ 12,155.2                                | \$741.9                                      | 20.20%                               |
| <b>2. Benefit Recipients</b>  |  |  |  |                                      |
| a. Retirement   | \$31,486.2   | \$31,486.2                                 | \$ 0.0                                       |                                      |
| b. Survivor   | 1,904.0  | 1,904.0                                    | 0.0  |                                      |
| c. Disability   | 271.6  | 271.6                                      | 0.0  |                                      |
| Total - Benefit Recipients  | \$33,661.7   | \$33,661.7                                 | \$ 0.0                                       |                                      |
| <b>3. Other Inactive</b>  | \$ 3,081.5   | \$ 3,081.5                                 |  |                                      |
| <b>4. Grand Total</b>   | \$55,243.5   | \$48,898.5                                 | \$741.9                                      | 20.20%                               |
| <b>5. Operating Expense</b>   |  |  | \$ 23.4                                      | 0.64%                                |
| <b>6. Total Normal Cost <sup>2</sup></b>  |  |  | \$765.3                                      | 20.84%                               |
| <b>7. Expected Pay During Fiscal Year 2022 for Defined Benefit Plans <sup>1</sup></b> |  |  |  | \$ 3,672.3                           |
| <b>8. Present Value of Future Salaries (PVFS) <sup>1</sup></b>                        |  |  |  | \$ 30,270.8                          |

<sup>1</sup> For members currently active as of June 30, 2021, in the Traditional and Portable defined benefit plans and includes the use of capped payroll for members hired on or after January 1, 2011.

<sup>2</sup> The normal cost as a percent of capped pay is 26.61% for Tier 1 members and 11.67% for Tier 2 members.

Excludes RSP.

Values may not add due to rounding.



**Table 7**  
**Defined Benefit Plan Development of the Actuarial Value of Assets**  
**for the Year Ending June 30, 2021**

|  | 2020                  | 2021                  | 2022           | 2023           | 2024           | 2025           |
|--|-----------------------|-----------------------|----------------|----------------|----------------|----------------|
| Beginning of Year:   |                       |                       |                |                |                |                |
| (1) Market Value of Assets   | \$ 19,717,347,961     | \$ 19,617,015,606     |                |                |                |                |
| (2) Actuarial Value of Assets  | 19,661,891,301        | 20,091,674,784        |                |                |                |                |
| End of Year:   |                       |                       |                |                |                |                |
| (3) Market Value of Assets   | 19,617,015,606        | 23,768,313,260        |                |                |                |                |
| (4) Net of Contributions and Disbursements                             | (642,510,122)         | (611,671,931)         |                |                |                |                |
| (5) Total Investment Income  |                       |                       |                |                |                |                |
| =(3)-(1)-(4)   | 542,177,767           | 4,762,969,585         |                |                |                |                |
| (6) Projected Rate of Return   | 6.75%                 | 6.75%                 |                |                |                |                |
| (7) Projected Investment Income  |                       |                       |                |                |                |                |
| =(1)x(6)+([1+(6)] <sup>5</sup> -1)x(4)                                 | 1,309,590,348         | 1,303,841,708         |                |                |                |                |
| (8) Investment Income in Excess of Projected Income                    | (767,412,581)         | 3,459,127,877         |                |                |                |                |
| (9) Excess Investment Income Recognized This Year (5 year recognition) |                       |                       |                |                |                |                |
| (9a) From This Year  | (153,482,516)         | 691,825,575           |                |                |                |                |
| (9b) From One Year Ago   | (30,001,418)          | (153,482,516)         | \$ 691,825,575 |                |                |                |
| (9c) From Two Years Ago  | 36,662,742            | (30,001,418)          | (153,482,516)  | \$ 691,825,575 |                |                |
| (9d) From Three Years Ago  | 155,949,656           | 36,662,742            | (30,001,418)   | (153,482,516)  | \$ 691,825,575 |                |
| (9e) From Four Years Ago   | (246,425,207)         | 155,949,656           | 36,662,744     | (30,001,419)   | (153,482,517)  | \$ 691,825,577 |
| (9f) Total Recognized Investment Gain/(Loss)                           | (237,296,743)         | 700,954,039           | 545,004,385    | 508,341,640    | 538,343,058    | 691,825,577    |
| (10) Change in Actuarial Value of Assets                               |                       |                       |                |                |                |                |
| =(4)+(7)+(9f)  | 429,783,483           | 1,393,123,816         |                |                |                |                |
| End of Year:   |                       |                       |                |                |                |                |
| <b>(3) Market Value of Assets</b>                                      | <b>19,617,015,606</b> | <b>23,768,313,260</b> |                |                |                |                |
| <b>(11) Final Actuarial Value of Assets</b>                            | <b>20,091,674,784</b> | <b>21,484,798,600</b> |                |                |                |                |
| (12) Difference Between Market & Actuarial Values                      | (474,659,178)         | 2,283,514,660         |                |                |                |                |
| (13) Actuarial Value Rate of Return                                    | 5.54 %                | 10.13 %               |                |                |                |                |
| (14) Estimated Market Value Rate of Return                             | 2.80 %                | 24.66 %               |                |                |                |                |
| (15) Ratio of Actuarial Value to Market Value                          | 102 %                 | 90 %                  |                |                |                |                |
| (16) SURS Reported Market Value Rate of Return                         | 2.64 %                | 23.75 %               |                |                |                |                |

Excludes RSP.



**Table 8**  
**Analysis of Change in**  
**Actuarial Accrued Liability and Actuarial Value of Assets**  
**for the Year Ending June 30, 2021**  
(\$ in Millions)

|   |           |                    |
|---|-----------|--------------------|
| 1. Actuarial (Gain)/Loss on Actuarial Accrued Liability ("AAL") |           |                    |
| (a) AAL 6/30/2020   |           | \$ 47,580.5        |
| (b) Normal Cost FY 2021   | \$ 739.7  |                    |
| (c) Benefits and Admin Expenses Paid FY 2021                    | (2,878.9) |                    |
| (d) Interest on (a), (b), and (c) at 6.75%                      | 3,140.7   |                    |
| (e) Expected AAL 6/30/2021 (a+b+c+d)                            |           | 48,581.9           |
| (f) Actual AAL 6/30/2021 Before Assumption and Method Changes   |           | 48,534.6           |
| (g) Actuarial (Gain)/Loss on AAL (f-e)                          |           | <u>\$ (47.3)</u>   |
| (h) Impact of Benefit Changes                                   |           | 0.0                |
| (i) Impact of Change in Actuarial Assumptions and Methods       |           | 363.8              |
| (j) Actual AAL After Changes (f+h+i)                            |           | <u>\$ 48,898.5</u> |
| 2. Actuarial (Gain)/Loss on Assets                              |           |                    |
| (a) Actuarial Value of Assets 6/30/2020                         |           | \$ 20,091.7        |
| (b) Contributions FY 2021                                       | 2,267.2   |                    |
| (c) Benefits and Administrative Expenses                        | (2,878.9) |                    |
| (d) Interest on (a), (b), and (c) at 6.75%                      | 1,335.9   |                    |
| (e) Expected Assets 6/30/2021 (a+b+c+d)                         |           | \$ 20,815.9        |
| (f) Actual Actuarial Value of Assets 6/30/2021                  |           | 21,484.8           |
| (g) Actuarial (Gain)/Loss on Assets (e-f)                       |           | <u>\$ (668.9)</u>  |
| 3. Total Actuarial (Gain)/Loss                                  |           |                    |
| (a) (Gain)/Loss on AAL  |           | \$ (47.3)          |
| (b) (Gain)/Loss on Assets                                       |           | (668.9)            |
| (c) Net (Gain)/Loss (a+b)                                       |           | <u>\$ (716.2)</u>  |

*Excludes RSP.*

*Values may not add due to rounding.*



**Table 9**  
**Analysis of Change in**  
**Unfunded Actuarial Accrued Liability**  
**for the Year Ending June 30, 2021**  
**(\$ in Millions)**

|  |    |          |
|--|----|----------|
| 1. Unfunded Actuarial Accrued Liability (UAAL) at 06/30/2020 | \$ | 27,488.8 |
| 2. Contributions   |    |          |
| a. Contributions equal to normal cost plus interest on UAAL  |    |          |
| i Interest on 1)   | \$ | 1,855.5  |
| ii Member contributions                                      |    | 288.5    |
| iii Employer/State normal cost                               |    | 451.2    |
| iv Interest on ii and iii                                    |    | 24.6     |
| v Total due  | \$ | 2,619.7  |
| b. Contributions paid based on funding policy                |    |          |
| i Member contributions                                       | \$ | 288.5    |
| ii Employer/State contributions                              |    | 1,978.7  |
| iii Interest on i and ii                                     |    | 75.3     |
| iv Total paid  | \$ | 2,342.5  |
| c. Expected increase in UAAL (2a.v-2b.iv)                    |    |          |
|  |    | 277.2    |
| 3. Expected UAAL at 06/30/2021 (1+2c)                        |    | 27,766.0 |
| 4. (Gains)/Losses  |    |          |
| a. Investment income   | \$ | (668.9)  |
| b. Salary increases  |    | (88.5)   |
| c. Demographic and other                                     |    | 41.2     |
| d. Total   | \$ | (716.2)  |
| 5. Plan Provision Changes                                    |    | -        |
| 6. Assumption Changes  |    | 363.8    |
| 7. Total Change in UAAL (2c + 4d + 5 + 6)                    |    | (75.1)   |
| 8. UAAL at 06/30/2021 (1 + 7)                                | \$ | 27,413.7 |

*Excludes RSP.*

*Values may not add due to rounding.*



## Table 10

### Analysis of Actuarial (Gains) and Losses

(\$ in Millions)

|   | Amount of (Gain) or Loss |                 |                 |                   |
|---|--------------------------|-----------------|-----------------|-------------------|
|   | FY 2018                  | FY 2019         | FY 2020         | FY 2021           |
| Investment Return <sup>1</sup>          | \$ (92.7)                | \$ 234.1        | \$ 233.5        | \$ (668.9)        |
| Salary Increase                         | (8.5)                    | (55.2)          | 5.4             | (88.5)            |
| Age and Service Retirement              | 16.1                     | 53.4            | 6.0             | 9.6               |
| General Employment Termination          | 15.3                     | 29.3            | 22.3            | 28.8              |
| Disability Incidence                    | 5.4                      | 4.5             | (1.7)           | (2.0)             |
| In Service Mortality                    | (3.4)                    | (5.5)           | 1.2             | 3.8               |
| Benefit Recipient <sup>2</sup>          | 20.1                     | 41.8            | 13.3            | (61.8)            |
| New Entrants <sup>3</sup>               | 76.6                     | 87.1            | 83.1            | 58.9              |
| Other <sup>4</sup>                      | (13.6)                   | (35.9)          | (27.1)          | 3.9               |
| <b>Total Actuarial (Gain)/Loss</b>      | <b>\$ 15.3</b>           | <b>\$ 353.6</b> | <b>\$ 336.0</b> | <b>\$ (716.2)</b> |
| BOY Actuarial Accrued Liability (AAL)   | \$ 41,853.3              | \$ 45,258.8     | \$ 46,443.9     | \$ 47,580.5       |
| (Gain)/Loss as a % of BOY AAL           | 0.0%                     | 0.8%            | 0.7%            | (1.5)%            |
| <b>Total Non-Investment (Gain)/Loss</b> | <b>\$ 108.0</b>          | <b>\$ 119.5</b> | <b>\$ 102.5</b> | <b>\$ (47.3)</b>  |
| (Gain)/Loss as a % of BOY AAL           | 0.3%                     | 0.3%            | 0.2%            | (0.1)%            |

Excludes RSP.

<sup>1</sup> Gain/Loss is based on actuarial value of assets.

<sup>2</sup> Benefit recipient (gain)/loss includes mortality gains and losses as well as gains and losses due to unexpected changes in benefit amounts from year to year. Unexpected changes may occur when benefits that are initially paid as preliminary estimates are finalized. Mortality gains and losses include deviations in the assumed demographics of future beneficiaries compared to the actual demographics of new beneficiaries.

Beginning with the actuarial valuation as of June 30, 2011, there is an additional load of 10% on the liabilities of those retirees who are currently receiving benefits as a preliminary estimate. Beginning with the actuarial valuation as of June 30, 2015, the load of 10% was reduced to 5% for retirees who are currently receiving benefits as a preliminary estimate for whom Staff provided a best formula benefit.

<sup>3</sup> Only includes liability for new entrants. Does not include the impact of new entrant contributions.

<sup>4</sup> Includes other experience such as deviations between actual and expected benefit payments and refunds that were not easily attributable to one of the categories above.



**Table 11**  
**Funded Ratio and Illustrative Contributions under Funding Policy of Net Normal Cost Plus**  
**Level Percentage of Payroll Amortization of Unfunded Liability**  
(\$ in Millions)

| Fiscal Year | DB Payroll <sup>1</sup> | Actuarial Value of Assets (AVA) | Actuarial Accrued Liability (AAL) | Unfunded Actuarial Accrued Liability (UAAL) | Funded Ratio | Total Normal Cost | Member Contributions <sup>2</sup> | Amortization of UAAL (30-year open) <sup>3</sup> | Net State Contribution (30-year open) <sup>3</sup> | Amortization of UAAL (30-year closed) <sup>4</sup> | Net State Contribution (30-year closed) <sup>4</sup> | Net State 30-year closed with 1 year Interest Adjustment <sup>4</sup> |
|-------------|-------------------------|---------------------------------|-----------------------------------|---|--------------|-------------------|-----------------------------------|--|--|--|--|---|
| 2015        | \$3,606.537             | \$17,104.607                    | \$39,520.687                      | \$22,416.080                                | 43.28 %      | \$730.020         | \$267.682                         | \$1,160.318                                      | \$1,622.656  |  |  |   |
| 2016        | 3,513.108               | 17,701.646                      | 40,923.301                        | 23,221.655                                  | 43.26        | 739.549           | 278.884                           | 1,205.004  | 1,665.669  | \$1,350.394  | \$1,811.060  | \$1,942.361   |
| 2017        | 3,458.320               | 18,594.326                      | 41,853.348                        | 23,259.022                                  | 44.43        | 719.225           | 278.643                           | 1,248.309  | 1,688.891  | \$1,424.261  | \$1,864.843  | \$2,000.044   |
| 2018        | 3,470.226               | 19,347.886                      | 45,258.751                        | 25,910.865                                  | 42.75        | 701.871           | 282.726                           | 1,250.317  | 1,669.462  | 1,442.888  | 1,862.033  | 1,997.030   |
| 2019        | 3,506.650               | 19,661.891                      | 46,443.937                        | 26,782.046                                  | 42.33        | 730.265           | 280.018                           | 1,392.034  | 1,842.281  | 1,789.119  | 2,239.366  | 2,390.524   |
| 2020        | 3,642.617               | 20,091.675                      | 47,580.470                        | 27,488.795                                  | 42.23        | 729.332           | 282.367                           | 1,414.304  | 1,861.269  | 1,852.066  | 2,299.031  | 2,454.215   |
| 2021        | 3,638.244               | 21,484.799                      | 48,898.480                        | 27,413.681                                  | 43.94        | 739.676           | 288.476                           | 1,451.626  | 1,902.826  | 1,852.066  | 2,303.266  | 2,458.736   |
| 2022        |                         |                                 |                                   |   |              | 765.300           | 296.399                           | 1,449.109  | 1,918.010  | 1,901.545  | 2,370.446  | 2,524.525   |

<sup>1</sup> Defined Benefit Plan payroll is rolled forward with one year of salary scale at 3.00% (3.25% from 2018 through 2020, 3.75% prior to fiscal year 2018) and uses capped payroll for members hired on and after January 1, 2011.

<sup>2</sup> Projected for Fiscal Year 2022 and actual for years prior to Fiscal Year 2022.

<sup>3</sup> A 30-year open period amortization policy is not a funding policy recommended by GRS. This illustrative contribution was included at the request of the Governor's Office. The amortization payment was calculated as a level percentage of total uncapped payroll (assumed to increase by 3.00% each year, 3.25% for fiscal years 2018 through 2021 and 3.75% for years prior to Fiscal Year 2019).

<sup>4</sup> GRS recommends a 30-year (or shorter) closed amortization period beginning with Fiscal Year 2015, 23 years remaining at Fiscal Year 2022. (The statutory contribution would apply to Fiscal Year 2023; therefore a one year interest adjustment was applied). The amortization payment was calculated as a level percentage of defined benefit plan pensionable (capped) payroll.

## **APPENDIX D**

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### **ACTUARIAL PROJECTIONS**

**Table 12**  
**Baseline Projections – Actuarial Valuation June 30, 2021**  
**Assumes Contributions Based on Table 14 & Investment Return of 6.50% Each Year**  
**(\$ in Millions)**

| Fiscal Year Ending | Total Payroll <sup>1</sup> | RSP Payroll  | DB Payroll <sup>1</sup> | SURS Contributions <sup>2</sup> | Member Contributions | Benefits     | Expenses  | Assets EOY    | AAL           | Funding Ratio | UAAL          | Debt Service | Maximum Contribution <sup>3</sup> | SURS Contribution % of Total Payroll |
|--------------------|----------------------------|--------------|-------------------------|---------------------------------|----------------------|--------------|-----------|---------------|---------------|---------------|---------------|--------------|-----------------------------------|--------------------------------------|
| 2021               | \$ 4,639.067               | \$ 1,106.791 | \$ 3,532.276            | \$ 1,978.743                    | \$ 288.476           | \$ 2,859.503 | \$ 19.389 | \$ 21,484.799 | \$ 48,898.480 | 43.94 %       | \$ 27,413.681 | \$ 139.615   | \$ 1,962.151                      | 42.65 %                              |
| 2022               | 4,906.777                  | 1,206.414    | 3,700.363               | 2,054.958                       | 296.399              | 3,045.764    | 23.371    | 22,834.005    | 49,699.352    | 45.94         | 26,865.347    | 146.736      | 2,058.734                         | 41.88                                |
| 2023               | 4,994.329                  | 1,270.644    | 3,723.685               | 2,070.405                       | 298.267              | 3,114.392    | 24.072    | 24,145.145    | 50,469.582    | 47.84         | 26,324.437    | 153.373      | 2,082.927                         | 41.46                                |
| 2024               | 5,097.777                  | 1,338.998    | 3,758.779               | 2,087.445                       | 301.078              | 3,215.529    | 24.794    | 25,453.835    | 51,174.310    | 49.74         | 25,720.475    | 164.417      | 2,099.606                         | 40.95                                |
| 2025               | 5,210.642                  | 1,407.642    | 3,803.000               | 2,079.468                       | 304.620              | 3,320.619    | 25.538    | 26,852.284    | 51,805.954    | 51.83         | 24,953.670    | 174.604      | 2,091.185                         | 39.91                                |
| 2026               | 5,328.838                  | 1,475.531    | 3,853.307               | 2,072.081                       | 308.650              | 3,422.007    | 26.304    | 27,495.952    | 52,364.596    | 52.51         | 24,868.644    | 179.149      | 2,088.464                         | 38.88                                |
| 2027               | 5,451.986                  | 1,543.689    | 3,908.297               | 2,056.228                       | 313.055              | 3,519.704    | 27.093    | 28,068.007    | 52,851.004    | 53.11         | 24,782.997    | 183.195      | 2,077.259                         | 37.72                                |
| 2028               | 5,579.895                  | 1,612.394    | 3,967.501               | 2,104.469                       | 317.797              | 3,615.574    | 27.906    | 28,632.150    | 53,264.148    | 53.76         | 24,631.998    | 191.634      | 2,121.852                         | 37.72                                |
| 2029               | 5,712.086                  | 1,682.338    | 4,029.748               | 2,154.325                       | 322.783              | 3,706.224    | 28.743    | 29,195.144    | 53,605.407    | 54.46         | 24,410.263    | 199.325      | 2,168.968                         | 37.72                                |
| 2030               | 5,847.857                  | 1,753.121    | 4,094.736               | 2,205.532                       | 327.988              | 3,800.281    | 29.606    | 29,754.993    | 53,866.895    | 55.24         | 24,111.902    | 211.160      | 2,213.425                         | 37.72                                |
| 2031               | 5,985.645                  | 1,825.475    | 4,160.169               | 2,257.499                       | 333.230              | 3,892.808    | 30.494    | 30,313.867    | 54,045.442    | 56.09         | 23,731.575    | 221.997      | 2,259.717                         | 37.72                                |
| 2032               | 6,128.196                  | 1,900.647    | 4,227.548               | 2,311.262                       | 338.627              | 3,974.340    | 31.409    | 30,885.037    | 54,147.402    | 57.04         | 23,262.365    | 226.944      | 2,313.874                         | 37.72                                |
| 2033               | 6,278.327                  | 1,979.042    | 4,299.285               | 2,367.884                       | 344.373              | 4,045.827    | 32.351    | 31,482.950    | 54,179.083    | 58.11         | 22,696.133    | 226.249      | 2,376.815                         | 37.72                                |
| 2034               | 6,432.690                  | 2,059.837    | 4,372.853               | 2,426.103                       | 350.266              | 4,110.617    | 33.321    | 32,118.025    | 54,143.761    | 59.32         | 22,025.736    | NA           | 2,667.064                         | 37.72                                |
| 2035               | 6,590.216                  | 2,142.939    | 4,447.277               | 2,485.514                       | 356.227              | 4,170.804    | 34.321    | 32,798.700    | 54,042.206    | 60.69         | 21,243.506    | NA           | 2,732.376                         | 37.72                                |
| 2036               | 6,749.900                  | 2,227.354    | 4,522.546               | 2,545.739                       | 362.256              | 4,224.206    | 35.351    | 33,535.820    | 53,877.193    | 62.24         | 20,341.373    | NA           | 2,798.583                         | 37.72                                |
| 2037               | 6,913.671                  | 2,314.908    | 4,598.763               | 2,607.506                       | 368.361              | 4,193.709    | 36.411    | 34,421.273    | 53,731.174    | 64.06         | 19,309.901    | NA           | 2,866.484                         | 37.72                                |
| 2038               | 7,081.668                  | 2,404.768    | 4,676.901               | 2,670.866                       | 374.620              | 4,232.185    | 37.504    | 35,395.293    | 53,534.512    | 66.12         | 18,139.219    | NA           | 2,936.138                         | 37.72                                |
| 2039               | 7,254.484                  | 2,496.113    | 4,758.371               | 2,736.044                       | 381.146              | 4,260.113    | 38.629    | 36,476.640    | 53,295.977    | 68.44         | 16,819.337    | NA           | 3,007.789                         | 37.72                                |
| 2040               | 7,432.748                  | 2,590.542    | 4,842.206               | 2,803.277                       | 387.861              | 4,280.697    | 39.788    | 37,682.149    | 53,021.984    | 71.07         | 15,339.835    | NA           | 3,081.699                         | 37.72                                |
| 2041               | 7,618.403                  | 2,686.842    | 4,931.561               | 2,873.297                       | 395.018              | 4,289.678    | 40.981    | 39,035.161    | 52,724.525    | 74.04         | 13,689.364    | NA           | 3,158.674                         | 37.72                                |
| 2042               | 7,808.665                  | 2,784.286    | 5,024.380               | 2,945.055                       | 402.453              | 4,287.542    | 42.211    | 40,558.781    | 52,416.251    | 77.38         | 11,857.470    | NA           | 3,237.559                         | 37.72                                |
| 2043               | 8,003.846                  | 2,883.260    | 5,120.585               | 3,018.668                       | 410.159              | 4,275.951    | 43.477    | 42,276.011    | 52,108.558    | 81.13         | 9,832.547     | NA           | 3,318.483                         | 37.72                                |
| 2044               | 8,202.461                  | 2,984.064    | 5,218.397               | 3,093.576                       | 417.994              | 4,256.042    | 44.781    | 44,209.452    | 51,811.916    | 85.33         | 7,602.464     | NA           | 3,400.831                         | 37.72                                |
| 2045               | 8,404.973                  | 3,087.065    | 5,317.909               | 3,169.954                       | 425.964              | 4,228.503    | 46.125    | 46,382.646    | 51,536.274    | 90.00         | 5,153.628     | NA           | 3,484.794                         | 37.72                                |

Projections are based on 55% of academic and 75% of non-academic new hires electing Tier 2 and 45% of academic and 25% of non-academic new hires electing RSP and 73,443 total active members (70,266 full time and 3,177 part time) in each future year.

- <sup>1</sup> Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.
- <sup>2</sup> Excludes RSP contributions. Includes employer contributions.
- <sup>3</sup> Maximum contribution after the impact of debt service. Maximum contribution is equal to the SURS contribution shown on Table 17 (before the impact of the bonds issued in 2004) minus the debt service.

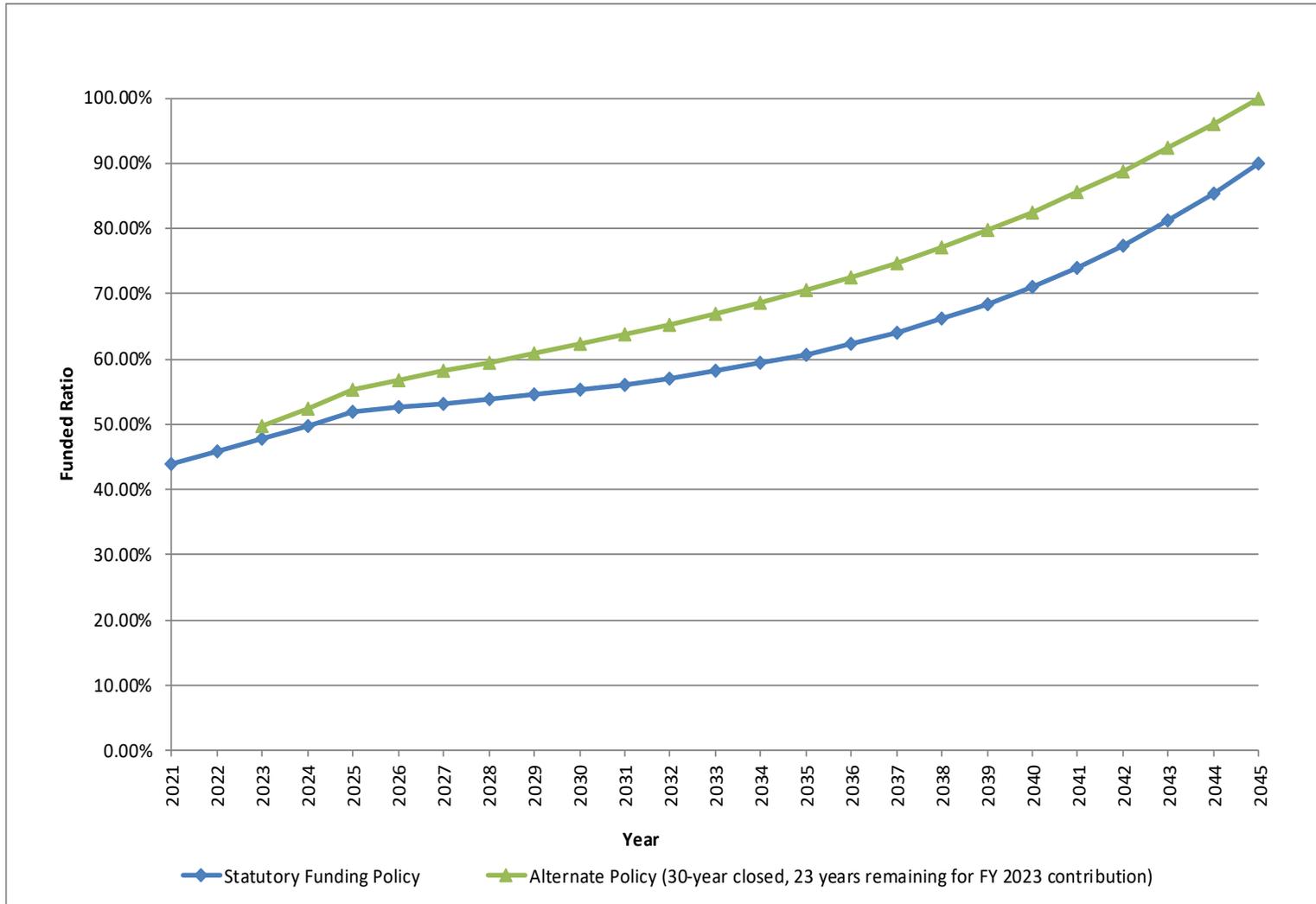


# Graph 1

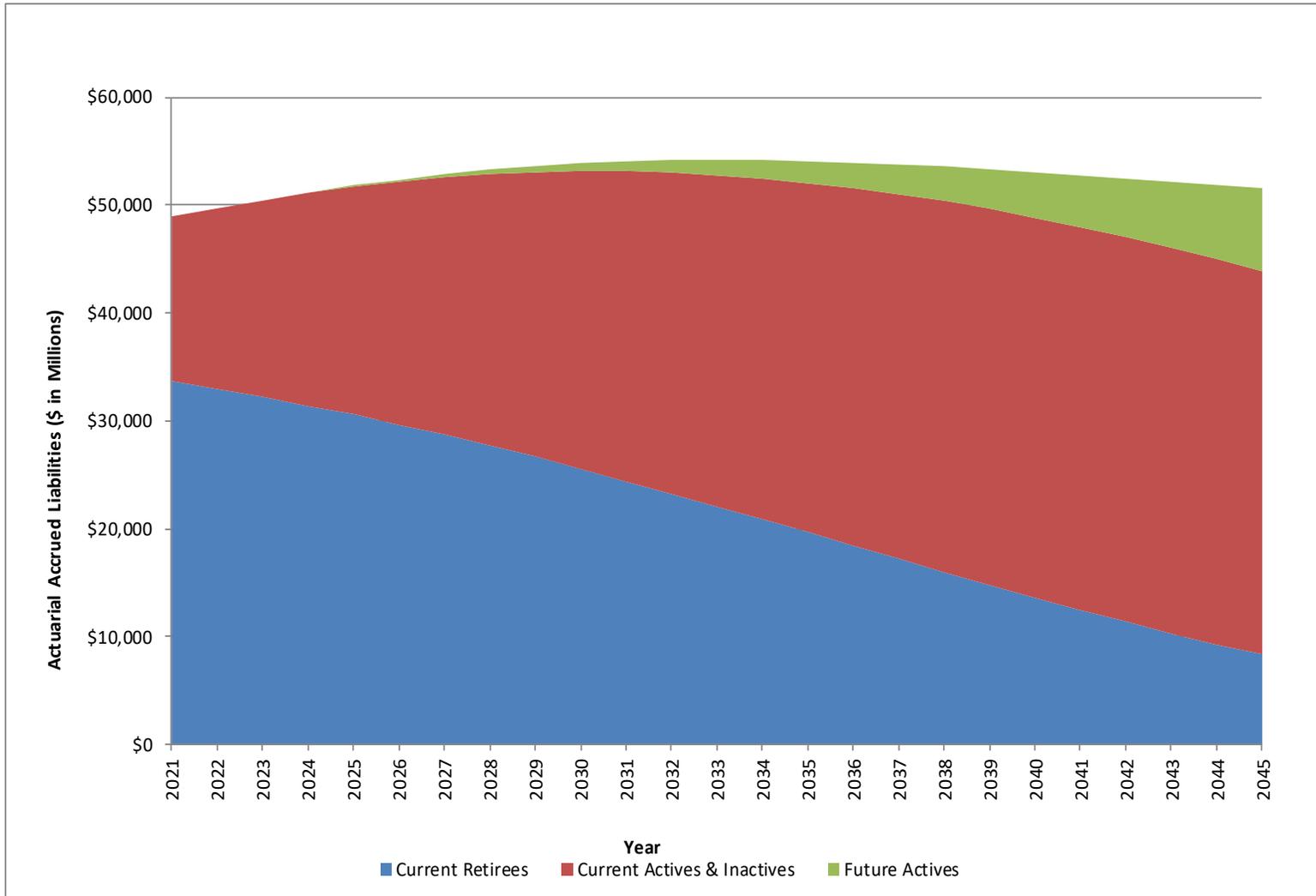
## Projected Funded Ratio Based on Statutory Contributions

### Actuarial Valuation as of June 30, 2021

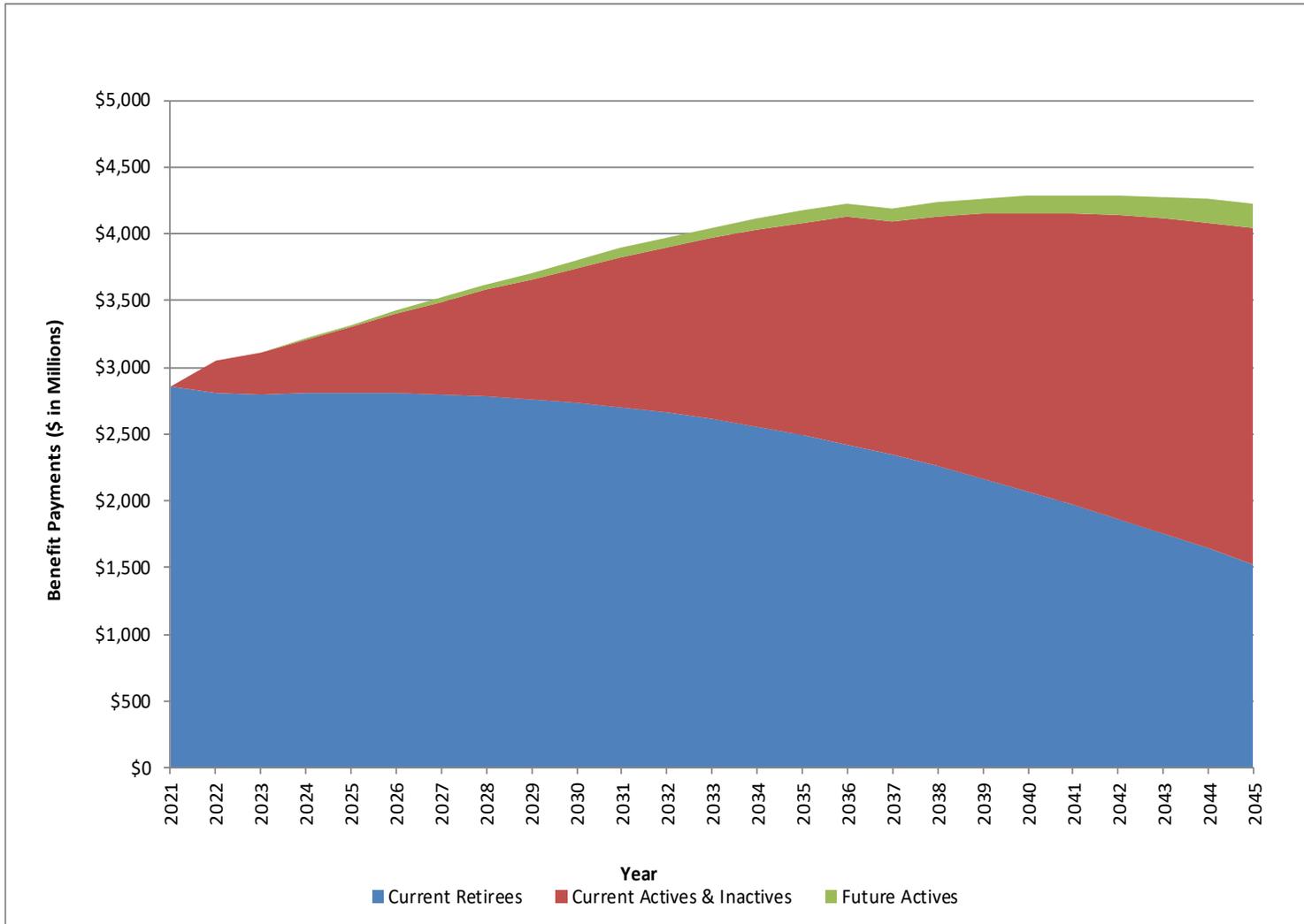
(\$ in Millions)



**Graph 2**  
**Projected Actuarial Accrued Liabilities**  
**Actuarial Valuation as of June 30, 2021**  
 (\$ in Millions)



### Graph 3 Projected Benefit Payments Actuarial Valuation as of June 30, 2021 (\$ in Millions)



**Table 13**  
**Projected Statutory Contributions for the Actuarial Valuation as of June 30, 2021**  
**Before Impact of Bonds Issued in 2004**  
(\$ in Millions)

| FYE   | SURS Cont. <sup>1</sup> | RSP Cont. <sup>1</sup> | Combined State and Employer Contribution |                       |
|-------|-------------------------|------------------------|--|-----------------------|
|       |                         |                        | \$                                       | % of Pay <sup>2</sup> |
| 2022  | \$ 2,205.470            | \$ 87.059              | \$ 2,292.529                             | 46.72 %               |
| 2023  | 2,236.299               | 90.469                 | 2,326.768                                | 46.59                 |
| 2024  | 2,264.023               | 95.156                 | 2,359.179                                | 46.28                 |
| 2025  | 2,265.789               | 100.012                | 2,365.801                                | 45.40                 |
| 2026  | 2,267.613               | 104.816                | 2,372.429                                | 44.52                 |
| 2027  | 2,260.453               | 109.640                | 2,370.093                                | 43.47                 |
| 2028  | 2,313.486               | 114.504                | 2,427.990                                | 43.51                 |
| 2029  | 2,368.294               | 119.455                | 2,487.749                                | 43.55                 |
| 2030  | 2,424.586               | 124.467                | 2,549.053                                | 43.59                 |
| 2031  | 2,481.714               | 129.590                | 2,611.304                                | 43.63                 |
| 2032  | 2,540.817               | 134.913                | 2,675.730                                | 43.66                 |
| 2033  | 2,603.063               | 140.463                | 2,743.526                                | 43.70                 |
| 2034  | 2,667.064               | 146.183                | 2,813.247                                | 43.73                 |
| 2035  | 2,732.376               | 152.066                | 2,884.442                                | 43.77                 |
| 2036  | 2,798.583               | 158.043                | 2,956.626                                | 43.80                 |
| 2037  | 2,866.484               | 164.242                | 3,030.726                                | 43.84                 |
| 2038  | 2,936.138               | 170.604                | 3,106.742                                | 43.87                 |
| 2039  | 3,007.789               | 177.072                | 3,184.861                                | 43.90                 |
| 2040  | 3,081.699               | 183.758                | 3,265.457                                | 43.93                 |
| 2041  | 3,158.674               | 190.577                | 3,349.251                                | 43.96                 |
| 2042  | 3,237.559               | 197.479                | 3,435.038                                | 43.99                 |
| 2043  | 3,318.483               | 204.489                | 3,522.972                                | 44.02                 |
| 2044  | 3,400.831               | 211.629                | 3,612.460                                | 44.04                 |
| 2045  | 3,484.794               | 218.926                | 3,703.720                                | 44.07                 |
| Total | \$64,922.081            | \$3,525.612            | \$68,447.693                             |                       |

<sup>1</sup> Assumes 75 percent of new hires elect Tier 2 and 25 percent elect to participate in the Retirement Savings Plan (RSP) for the Non-Academic members and 55 percent of new hires elect Tier 2 and 45 percent elect to participate in the Retirement Savings Plan (RSP) for the Academic members.

<sup>2</sup> Percent of pay amounts are calculated based on pensionable pay. Pensionable pay does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.



**Table 14**  
**Projected Statutory Contributions for the Actuarial Valuation as of June 30, 2021**  
**Including Impact of Bonds Issued in 2004**  
(\$ in Millions)

| FYE   | SURS Cont. <sup>1</sup> | RSP Cont. <sup>1</sup> | Combined State and Employer Contribution |                       | Debt Service |                       | SURS Alternate Policy Contribution <sup>3</sup> |               | Projected % of Alternate Policy Contributed <sup>4</sup> | Employer Contributions | Federal/Trust Fund Contributions | Qualified Plan State Contribution |
|-------|-------------------------|------------------------|--|-----------------------|--------------|-----------------------|---|---------------|--|------------------------|----------------------------------|-----------------------------------|
|       |                         |                        | \$                                       | % of Pay <sup>2</sup> | \$           | % of Pay <sup>2</sup> | SURS Cont.                                      | Total (w/RSP) |  |                        |                                  |                                   |
| 2022  | \$ 2,054.958            | \$ 87.059              | \$ 2,142.017                             | 43.65 %               | \$ 146.736   | 2.99 %                | \$ 2,458.736                                    | \$ 2,545.795  | 84.14 %  | \$ 5.369               | \$ 57.000                        | \$ 2,079.648                      |
| 2023  | 2,070.405               | 90.469                 | 2,160.874                                | 43.27                 | 153.373      | 3.07                  | 2,524.525                                       | 2,614.994     | 82.63  | 5.048                  | 62.000                           | 2,093.826                         |
| 2024  | 2,087.445               | 95.156                 | 2,182.601                                | 42.81                 | 164.417      | 3.23                  | 2,472.862                                       | 2,568.018     | 84.99  | 9.198                  | NA                               | 2,173.403                         |
| 2025  | 2,079.468               | 100.012                | 2,179.480                                | 41.83                 | 174.604      | 3.35                  | 2,424.725                                       | 2,524.737     | 86.33  | 8.784                  | NA                               | 2,170.696                         |
| 2026  | 2,072.081               | 104.816                | 2,176.897                                | 40.85                 | 179.149      | 3.36                  | 2,375.241                                       | 2,480.057     | 87.78  | 8.652                  | NA                               | 2,168.245                         |
| 2027  | 2,056.228               | 109.640                | 2,165.868                                | 39.73                 | 183.195      | 3.36                  | 2,313.913                                       | 2,423.553     | 89.37  | 8.494                  | NA                               | 2,157.374                         |
| 2028  | 2,104.469               | 114.504                | 2,218.973                                | 39.77                 | 191.634      | 3.43                  | 2,319.194                                       | 2,433.698     | 91.18  | 8.315                  | NA                               | 2,210.658                         |
| 2029  | 2,154.325               | 119.455                | 2,273.780                                | 39.81                 | 199.325      | 3.49                  | 2,331.484                                       | 2,450.939     | 92.77  | 8.204                  | NA                               | 2,265.576                         |
| 2030  | 2,205.532               | 124.467                | 2,329.999                                | 39.84                 | 211.160      | 3.61                  | 2,344.350                                       | 2,468.817     | 94.38  | 8.053                  | NA                               | 2,321.946                         |
| 2031  | 2,257.499               | 129.590                | 2,387.089                                | 39.88                 | 221.997      | 3.71                  | 2,357.264                                       | 2,486.854     | 95.99  | 7.866                  | NA                               | 2,379.223                         |
| 2032  | 2,311.262               | 134.913                | 2,446.175                                | 39.92                 | 226.944      | 3.70                  | 2,370.503                                       | 2,505.416     | 97.64  | 7.664                  | NA                               | 2,438.511                         |
| 2033  | 2,367.884               | 140.463                | 2,508.347                                | 39.95                 | 226.249      | 3.60                  | 2,383.823                                       | 2,524.286     | 99.37  | 7.401                  | NA                               | 2,500.946                         |
| 2034  | 2,426.103               | 146.183                | 2,572.286                                | 39.99                 |              |                       | 2,398.369                                       | 2,544.552     | 101.09   | 7.145                  | NA                               | 2,565.141                         |
| 2035  | 2,485.514               | 152.066                | 2,637.580                                | 40.02                 |              |                       | 2,413.278                                       | 2,565.344     | 102.82   | 6.863                  | NA                               | 2,630.717                         |
| 2036  | 2,545.739               | 158.043                | 2,703.782                                | 40.06                 |              |                       | 2,427.881                                       | 2,585.924     | 104.56   | 6.570                  | NA                               | 2,697.212                         |
| 2037  | 2,607.506               | 164.242                | 2,771.748                                | 40.09                 |              |                       | 2,441.630                                       | 2,605.872     | 106.37   | 6.220                  | NA                               | 2,765.528                         |
| 2038  | 2,670.866               | 170.604                | 2,841.470                                | 40.12                 |              |                       | 2,454.106                                       | 2,624.710     | 108.26   | 5.817                  | NA                               | 2,835.653                         |
| 2039  | 2,736.044               | 177.072                | 2,913.116                                | 40.16                 |              |                       | 2,465.085                                       | 2,642.157     | 110.26   | 5.357                  | NA                               | 2,907.759                         |
| 2040  | 2,803.277               | 183.758                | 2,987.035                                | 40.19                 |              |                       | 2,474.662                                       | 2,658.420     | 112.36   | 4.856                  | NA                               | 2,982.179                         |
| 2041  | 2,873.297               | 190.577                | 3,063.874                                | 40.22                 |              |                       | 2,484.232                                       | 2,674.809     | 114.55   | 4.347                  | NA                               | 3,059.527                         |
| 2042  | 2,945.055               | 197.479                | 3,142.534                                | 40.24                 |              |                       | 2,489.903                                       | 2,687.382     | 116.94   | 3.825                  | NA                               | 3,138.709                         |
| 2043  | 3,018.668               | 204.489                | 3,223.157                                | 40.27                 |              |                       | 2,488.060                                       | 2,692.549     | 119.71   | 3.350                  | NA                               | 3,219.807                         |
| 2044  | 3,093.576               | 211.629                | 3,305.205                                | 40.30                 |              |                       | 2,468.103                                       | 2,679.732     | 123.34   | 2.901                  | NA                               | 3,302.304                         |
| 2045  | 3,169.954               | 218.926                | 3,388.880                                | 40.32                 |              |                       | 2,389.175                                       | 2,608.101     | 129.94   | 2.503                  | NA                               | 3,386.377                         |
| Total | \$ 59,197.155           | \$ 3,525.612           | \$ 62,722.767                            |                       | \$ 2,278.782 |                       | \$ 58,071.103                                   | \$ 61,596.715 |  | \$ 152.800             | \$ 119.000                       | \$ 62,450.967                     |

<sup>1</sup> Assumes 75 percent of new hires elect Tier 2 and 25 percent elect to participate in the Retirement Savings Plan (RSP) for the Non-Academic members and 55 percent of new hires elect Tier 2 and 45 percent elect to participate in the Retirement Savings Plan (RSP) for the Academic members.

<sup>2</sup> Percent of pay amounts are calculated based on pensionable pay. Pensionable pay does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

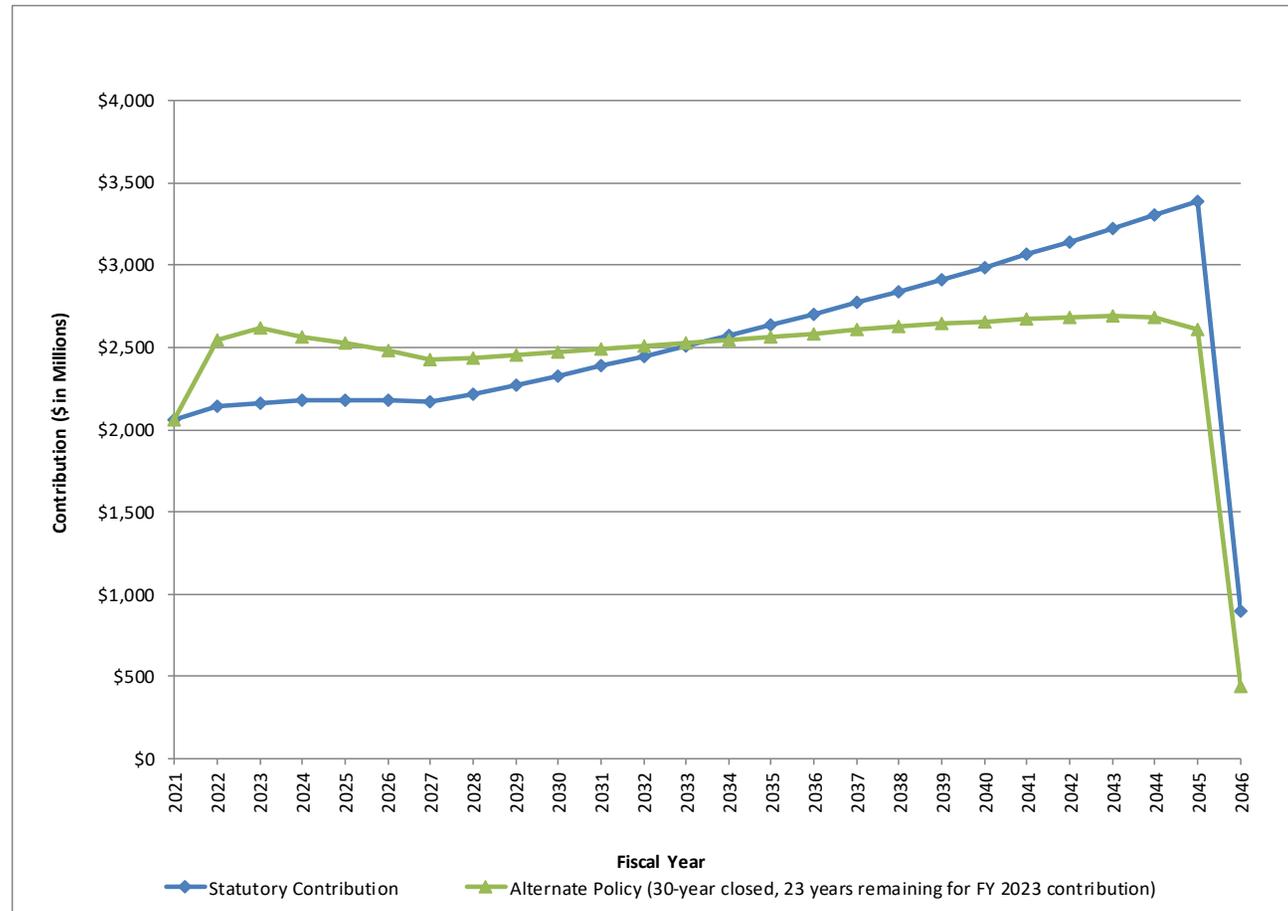
<sup>3</sup> Alternate funding policy of normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of defined benefit plan capped payroll beginning in FY 2016 with 23 years remaining as of FY 2023.

<sup>4</sup> Compares the SURS Statutory contribution (targets a funded ratio of 90% in 2045) against an alternate funding policy (targets a funded ratio of 100% in 2045).



## Graph 4

### Projected Statutory Contributions vs. Contributions under Alternate Policy (Normal Cost Plus 30-year Closed Period Level Percent of Pay Amortization) (23 years remaining in Amortization Period for FY 2023 Contribution) (\$ in Millions)



*Alternate funding policy of normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of defined benefit plan capped payroll beginning in FY 2016 and 23 years remaining in FY 2023. Alternate funding policy contributions based on actual assets as of the current valuation and the alternate policy contribution being made. The alternate funding policy contributions are projected to decrease after fiscal year 2023 as deferred asset gains are recognized in the actuarial value of assets.*

## **APPENDIX E**

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### **ADDITIONAL PROJECTION DETAILS**

Table 15

**Projections – Does Not Reflect Recognition of Deferred Asset Gains and Losses in Projected Actuarial Value of Assets (Impact of Bonds Issued in 2004 Included)**  
**Assumes Investment Return of 6.50% Each Year on Actuarial Value of Assets**  
**(\$ in Millions)**

| Fiscal Year Ending | Total Payroll <sup>1</sup> | RSP Payroll  | DB Payroll <sup>1</sup> | SURS Contributions <sup>2</sup> | Member Contributions | Benefits     | Expenses  | Assets EOY    | AAL           | Funding Ratio | UAAL          | Debt Service | Maximum Contribution <sup>3</sup> | SURS Contribution % of Total Payroll |
|--------------------|----------------------------|--------------|-------------------------|---------------------------------|----------------------|--------------|-----------|---------------|---------------|---------------|---------------|--------------|-----------------------------------|--------------------------------------|
| 2021               | \$ 4,639.067               | \$ 1,106.791 | \$ 3,532.276            | \$ 1,978.743                    | \$ 288.476           | \$ 2,859.503 | \$ 19.389 | \$ 21,484.799 | \$ 48,898.480 | 43.94 %       | \$ 27,413.681 | \$ 139.615   | \$ 1,962.151                      | 42.65 %                              |
| 2022               | 4,906.777                  | 1,206.414    | 3,700.363               | 2,054.958                       | 296.399              | 3,045.764    | 23.371    | 22,140.572    | 49,699.352    | 44.55         | 27,558.780    | 146.736      | 2,058.734                         | 41.88                                |
| 2023               | 4,994.329                  | 1,270.644    | 3,723.685               | 2,070.405                       | 298.267              | 3,114.392    | 24.072    | 22,785.294    | 50,469.582    | 45.15         | 27,684.288    | 153.373      | 2,082.927                         | 41.46                                |
| 2024               | 5,097.777                  | 1,338.998    | 3,758.779               | 2,143.367                       | 301.078              | 3,215.529    | 24.794    | 23,445.000    | 51,174.310    | 45.81         | 27,729.310    | 164.417      | 2,144.711                         | 42.05                                |
| 2025               | 5,210.642                  | 1,407.642    | 3,803.000               | 2,178.875                       | 304.620              | 3,320.619    | 25.538    | 24,078.668    | 51,805.954    | 46.48         | 27,727.286    | 174.604      | 2,178.875                         | 41.82                                |
| 2026               | 5,328.838                  | 1,475.531    | 3,853.307               | 2,220.788                       | 308.650              | 3,422.007    | 26.304    | 24,695.515    | 52,364.596    | 47.16         | 27,669.081    | 179.149      | 2,220.788                         | 41.67                                |
| 2027               | 5,451.986                  | 1,543.689    | 3,908.297               | 2,265.116                       | 313.055              | 3,519.704    | 27.093    | 25,301.112    | 52,851.004    | 47.87         | 27,549.892    | 183.195      | 2,265.116                         | 41.55                                |
| 2028               | 5,579.895                  | 1,612.394    | 3,967.501               | 2,314.116                       | 317.797              | 3,615.574    | 27.906    | 25,901.759    | 53,264.148    | 48.63         | 27,362.389    | 191.634      | 2,314.116                         | 41.47                                |
| 2029               | 5,712.086                  | 1,682.338    | 4,029.748               | 2,365.788                       | 322.783              | 3,706.224    | 28.743    | 26,505.504    | 53,605.407    | 49.45         | 27,099.903    | 199.325      | 2,365.788                         | 41.42                                |
| 2030               | 5,847.857                  | 1,753.121    | 4,094.736               | 2,414.923                       | 327.988              | 3,800.281    | 29.606    | 27,106.616    | 53,866.895    | 50.32         | 26,760.279    | 211.160      | 2,414.923                         | 41.30                                |
| 2031               | 5,985.645                  | 1,825.475    | 4,160.169               | 2,465.962                       | 333.230              | 3,892.808    | 30.494    | 27,708.477    | 54,045.442    | 51.27         | 26,336.965    | 221.997      | 2,465.962                         | 41.20                                |
| 2032               | 6,128.196                  | 1,900.647    | 4,227.548               | 2,525.031                       | 338.627              | 3,974.340    | 31.409    | 28,330.904    | 54,147.402    | 52.32         | 25,816.498    | 226.944      | 2,525.031                         | 41.20                                |
| 2033               | 6,278.327                  | 1,979.042    | 4,299.285               | 2,593.145                       | 344.373              | 4,045.827    | 32.351    | 28,995.264    | 54,179.083    | 53.52         | 25,183.819    | 226.249      | 2,593.145                         | 41.30                                |
| 2034               | 6,432.690                  | 2,059.837    | 4,372.853               | 2,688.551                       | 350.266              | 4,110.617    | 33.321    | 29,739.483    | 54,143.761    | 54.93         | 24,404.278    | NA           | 2,888.713                         | 41.80                                |
| 2035               | 6,590.216                  | 2,142.939    | 4,447.277               | 2,754.389                       | 356.227              | 4,170.804    | 34.321    | 30,543.029    | 54,042.206    | 56.52         | 23,499.177    | NA           | 2,959.453                         | 41.80                                |
| 2036               | 6,749.900                  | 2,227.354    | 4,522.546               | 2,821.129                       | 362.256              | 4,224.206    | 35.351    | 31,417.729    | 53,877.193    | 58.31         | 22,459.464    | NA           | 3,031.162                         | 41.80                                |
| 2037               | 6,913.671                  | 2,314.908    | 4,598.763               | 2,889.577                       | 368.361              | 4,193.709    | 36.411    | 32,456.601    | 53,731.174    | 60.41         | 21,274.573    | NA           | 3,104.706                         | 41.80                                |
| 2038               | 7,081.668                  | 2,404.768    | 4,676.901               | 2,959.792                       | 374.620              | 4,232.185    | 37.504    | 33,601.085    | 53,534.512    | 62.77         | 19,933.427    | NA           | 3,180.148                         | 41.80                                |
| 2039               | 7,254.484                  | 2,496.113    | 4,758.371               | 3,032.021                       | 381.146              | 4,260.113    | 38.629    | 34,871.252    | 53,295.977    | 65.43         | 18,424.725    | NA           | 3,257.754                         | 41.80                                |
| 2040               | 7,432.748                  | 2,590.542    | 4,842.206               | 3,106.526                       | 387.861              | 4,280.697    | 39.788    | 36,285.360    | 53,021.984    | 68.43         | 16,736.624    | NA           | 3,337.807                         | 41.80                                |
| 2041               | 7,618.403                  | 2,686.842    | 4,931.561               | 3,184.121                       | 395.018              | 4,289.678    | 40.981    | 37,868.348    | 52,724.525    | 71.82         | 14,856.177    | NA           | 3,421.178                         | 41.80                                |
| 2042               | 7,808.665                  | 2,784.286    | 5,024.380               | 3,263.641                       | 402.453              | 4,287.542    | 42.211    | 39,644.903    | 52,416.251    | 75.63         | 12,771.348    | NA           | 3,506.619                         | 41.80                                |
| 2043               | 8,003.846                  | 2,883.260    | 5,120.585               | 3,345.217                       | 410.159              | 4,275.951    | 43.477    | 41,639.727    | 52,108.558    | 79.91         | 10,468.831    | NA           | 3,594.268                         | 41.80                                |
| 2044               | 8,202.461                  | 2,984.064    | 5,218.397               | 3,428.229                       | 417.994              | 4,256.042    | 44.781    | 43,877.166    | 51,811.916    | 84.69         | 7,934.750     | NA           | 3,683.460                         | 41.80                                |
| 2045               | 8,404.973                  | 3,087.065    | 5,317.909               | 3,512.869                       | 425.964              | 4,228.503    | 46.125    | 46,382.646    | 51,536.274    | 90.00         | 5,153.628     | NA           | 3,774.402                         | 41.80                                |

<sup>1</sup> Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

<sup>2</sup> Excludes RSP contributions. Includes employer contributions.

<sup>3</sup> Maximum contribution after impact of debt service.



**Table 16**  
**Development of Market and Actuarial Value of Assets as of June 30, 2021**  
**after Bonds (Valuation Basis) and before Bonds (Hypothetical Basis)**

|    |  | After Bonds<br>(Valuation Basis) | Before Bonds<br>(Hypothetical) |
|----|--|----------------------------------|--------------------------------|
| 1  | Market Value at 6/30/2020  | \$19,617,015,606                 | \$17,323,378,042               |
| 2a | Employer and Non-Employer Contributing Entity Contributions <sup>1</sup> | 1,978,743,433                    | 2,101,766,117                  |
| 2b | Member Contributions   | 288,476,321                      | 288,476,321                    |
| 2c | Benefits and Expenses  | 2,878,891,685                    | 2,878,891,685                  |
| 2d | Net Non-Investment Cash Flow   | (611,671,931)                    | (488,649,247)                  |
| 3  | Investment Return<br>(Based on Estimated Rate of 24.66%)                 | 4,762,969,585                    | 4,215,748,853                  |
| 4  | Expected Return<br>(Based on Estimated Rate of 6.75%)                    | 1,303,841,708                    | 1,153,105,393                  |
| 5  | Market Value at 6/30/2021 (1+2d+3)                                       | 23,768,313,260                   | 21,050,477,648                 |
| 6  | Expected Market Value at 6/30/2021 (1+2d+4)                              | 20,309,185,383                   | 17,987,834,188                 |
| 7a | Actuarial Gain/(Loss) Current Year                                       | 3,459,127,877                    | 3,062,643,460                  |
| 7b | Actuarial Gain/(Loss) 1 Year Prior                                       | (767,412,581)                    | (676,460,110)                  |
| 7c | Actuarial Gain/(Loss) 2 Years Prior                                      | (150,007,091)                    | (131,557,100)                  |
| 7d | Actuarial Gain/(Loss) 3 Years Prior                                      | 183,313,712                      | 161,071,013                    |
| 7e | Actuarial Gain/(Loss) 4 Years Prior                                      | 779,748,280                      | 680,927,833                    |
| 8  | Actuarial Value at 6/30/2020   | 20,091,674,784                   | 17,742,866,398                 |
| 9  | Actuarial Value at 6/30/2021 (8+2d+4+.2*(7a+7b+7c+7d+7e))                | 21,484,798,600                   | 19,026,647,563                 |

<sup>1</sup>Hypothetical contributions (before bonds) are equal to the total contributions of \$2,187,128,000 minus actual fiscal year 2021 RSP contributions of \$85,361,883.

**Table 17**  
**Hypothetical Assets to Determine Maximum Contribution**  
**Projections – Reflects Recognition of Deferred Asset Gains and Losses in Projected Actuarial Value of**  
**Assets (Before Impact of Bonds Issued in 2004)**  
**(\$ in Millions)**

| Fiscal Year Ending | Total Payroll <sup>1</sup> | RSP Payroll  | DB Payroll <sup>1</sup> | SURS Contributions <sup>2</sup> | Member Contributions | Benefits     | Expenses  | Assets EOY    | AAL           | Funding Ratio | UAAL          | Debt Service | SURS Contribution % of Total Payroll |
|--------------------|----------------------------|--------------|-------------------------|---------------------------------|----------------------|--------------|-----------|---------------|---------------|---------------|---------------|--------------|--------------------------------------|
| 2021               | \$ 4,639.067               | \$ 1,106.791 | \$ 3,532.276            | \$ 2,101.766                    | \$ 288.476           | \$ 2,859.503 | \$ 19.389 | \$ 19,026.648 | \$ 48,898.480 | 38.91 %       | \$ 29,871.832 | NA           | 45.31 %                              |
| 2022               | 4,906.777                  | 1,206.414    | 3,700.363               | 2,205.470                       | 296.399              | 3,045.764    | 23.371    | 20,292.656    | 49,699.352    | 40.83         | 29,406.696    | NA           | 44.95                                |
| 2023               | 4,994.329                  | 1,270.644    | 3,723.685               | 2,236.299                       | 298.267              | 3,114.392    | 24.072    | 21,539.534    | 50,469.582    | 42.68         | 28,930.048    | NA           | 44.78                                |
| 2024               | 5,097.777                  | 1,338.998    | 3,758.779               | 2,264.023                       | 301.078              | 3,215.529    | 24.794    | 22,790.854    | 51,174.310    | 44.54         | 28,383.456    | NA           | 44.41                                |
| 2025               | 5,210.642                  | 1,407.642    | 3,803.000               | 2,265.789                       | 304.620              | 3,320.619    | 25.538    | 24,124.039    | 51,805.954    | 46.57         | 27,681.915    | NA           | 43.48                                |
| 2026               | 5,328.838                  | 1,475.531    | 3,853.307               | 2,267.613                       | 308.650              | 3,422.007    | 26.304    | 24,792.159    | 52,364.596    | 47.35         | 27,572.437    | NA           | 42.55                                |
| 2027               | 5,451.986                  | 1,543.689    | 3,908.297               | 2,260.453                       | 313.055              | 3,519.704    | 27.093    | 25,399.225    | 52,851.004    | 48.06         | 27,451.779    | NA           | 41.46                                |
| 2028               | 5,579.895                  | 1,612.394    | 3,967.501               | 2,313.486                       | 317.797              | 3,615.574    | 27.906    | 26,005.599    | 53,264.148    | 48.82         | 27,258.549    | NA           | 41.46                                |
| 2029               | 5,712.086                  | 1,682.338    | 4,029.748               | 2,368.294                       | 322.783              | 3,706.224    | 28.743    | 26,618.681    | 53,605.407    | 49.66         | 26,986.726    | NA           | 41.46                                |
| 2030               | 5,847.857                  | 1,753.121    | 4,094.736               | 2,424.586                       | 327.988              | 3,800.281    | 29.606    | 27,237.121    | 53,866.895    | 50.56         | 26,629.774    | NA           | 41.46                                |
| 2031               | 5,985.645                  | 1,825.475    | 4,160.169               | 2,481.714                       | 333.230              | 3,892.808    | 30.494    | 27,863.721    | 54,045.442    | 51.56         | 26,181.721    | NA           | 41.46                                |
| 2032               | 6,128.196                  | 1,900.647    | 4,227.548               | 2,540.817                       | 338.627              | 3,974.340    | 31.409    | 28,512.529    | 54,147.402    | 52.66         | 25,634.873    | NA           | 41.46                                |
| 2033               | 6,278.327                  | 1,979.042    | 4,299.285               | 2,603.063                       | 344.373              | 4,045.827    | 32.351    | 29,198.931    | 54,179.083    | 53.89         | 24,980.152    | NA           | 41.46                                |
| 2034               | 6,432.690                  | 2,059.837    | 4,372.853               | 2,667.064                       | 350.266              | 4,110.617    | 33.321    | 29,934.215    | 54,143.761    | 55.29         | 24,209.546    | NA           | 41.46                                |
| 2035               | 6,590.216                  | 2,142.939    | 4,447.277               | 2,732.376                       | 356.227              | 4,170.804    | 34.321    | 30,727.700    | 54,042.206    | 56.86         | 23,314.506    | NA           | 41.46                                |
| 2036               | 6,749.900                  | 2,227.354    | 4,522.546               | 2,798.583                       | 362.256              | 4,224.206    | 35.351    | 31,591.137    | 53,877.193    | 58.64         | 22,286.056    | NA           | 41.46                                |
| 2037               | 6,913.671                  | 2,314.908    | 4,598.763               | 2,866.484                       | 368.361              | 4,193.709    | 36.411    | 32,617.448    | 53,731.174    | 60.70         | 21,113.726    | NA           | 41.46                                |
| 2038               | 7,081.668                  | 2,404.768    | 4,676.901               | 2,936.138                       | 374.620              | 4,232.185    | 37.504    | 33,747.977    | 53,534.512    | 63.04         | 19,786.535    | NA           | 41.46                                |
| 2039               | 7,254.484                  | 2,496.113    | 4,758.371               | 3,007.789                       | 381.146              | 4,260.113    | 38.629    | 35,002.685    | 53,295.977    | 65.68         | 18,293.292    | NA           | 41.46                                |
| 2040               | 7,432.748                  | 2,590.542    | 4,842.206               | 3,081.699                       | 387.861              | 4,280.697    | 39.788    | 36,399.715    | 53,021.984    | 68.65         | 16,622.269    | NA           | 41.46                                |
| 2041               | 7,618.403                  | 2,686.842    | 4,931.561               | 3,158.674                       | 395.018              | 4,289.678    | 40.981    | 37,963.875    | 52,724.525    | 72.00         | 14,760.650    | NA           | 41.46                                |
| 2042               | 7,808.665                  | 2,784.286    | 5,024.380               | 3,237.559                       | 402.453              | 4,287.542    | 42.211    | 39,719.722    | 52,416.251    | 75.78         | 12,696.529    | NA           | 41.46                                |
| 2043               | 8,003.846                  | 2,883.260    | 5,120.585               | 3,318.483                       | 410.159              | 4,275.951    | 43.477    | 41,691.819    | 52,108.558    | 80.01         | 10,416.739    | NA           | 41.46                                |
| 2044               | 8,202.461                  | 2,984.064    | 5,218.397               | 3,400.831                       | 417.994              | 4,256.042    | 44.781    | 43,904.370    | 51,811.916    | 84.74         | 7,907.546     | NA           | 41.46                                |
| 2045               | 8,404.973                  | 3,087.065    | 5,317.909               | 3,484.794                       | 425.964              | 4,228.503    | 46.125    | 46,382.646    | 51,536.274    | 90.00         | 5,153.628     | NA           | 41.46                                |

<sup>1</sup> Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

<sup>2</sup> Excludes RSP contributions. Includes employer contributions.



**Table 18**

**Hypothetical Assets to Determine Maximum Contribution**

**Projections – Does Not Reflect Recognition of Deferred Asset Gains and Losses in Projected Actuarial Value of Assets  
(Before Impact of Bonds Issued in 2004)**

**Assumes Investment Return of 6.50% Each Year on Actuarial Value of Assets**

**(\$ in Millions)**

| Fiscal Year Ending | Total Payroll <sup>1</sup> | RSP Payroll  | DB Payroll <sup>1</sup> | SURS Contributions <sup>2</sup> | Member Contributions | Benefits     | Expenses  | Assets EOY    | AAL           | Funding Ratio | UAAL          | Debt Service | SURS Contribution % of Total Payroll |
|--------------------|----------------------------|--------------|-------------------------|---------------------------------|----------------------|--------------|-----------|---------------|---------------|---------------|---------------|--------------|--------------------------------------|
| 2021               | \$ 4,639.067               | \$ 1,106.791 | \$ 3,532.276            | \$ 2,101.766                    | \$ 288.476           | \$ 2,859.503 | \$ 19.389 | \$ 19,026.648 | \$ 48,898.480 | 38.91 %       | \$ 29,871.832 | NA           | 45.31 %                              |
| 2022               | 4,906.777                  | 1,206.414    | 3,700.363               | 2,205.470                       | 296.399              | 3,045.764    | 23.371    | 19,677.968    | 49,699.352    | 39.59         | 30,021.384    | NA           | 44.95                                |
| 2023               | 4,994.329                  | 1,270.644    | 3,723.685               | 2,236.299                       | 298.267              | 3,114.392    | 24.072    | 20,333.821    | 50,469.582    | 40.29         | 30,135.761    | NA           | 44.78                                |
| 2024               | 5,097.777                  | 1,338.998    | 3,758.779               | 2,309.128                       | 301.078              | 3,215.529    | 24.794    | 21,005.246    | 51,174.310    | 41.05         | 30,169.064    | NA           | 45.30                                |
| 2025               | 5,210.642                  | 1,407.642    | 3,803.000               | 2,353.478                       | 304.620              | 3,320.619    | 25.538    | 21,660.518    | 51,805.954    | 41.81         | 30,145.436    | NA           | 45.17                                |
| 2026               | 5,328.838                  | 1,475.531    | 3,853.307               | 2,399.936                       | 308.650              | 3,422.007    | 26.304    | 22,305.065    | 52,364.596    | 42.60         | 30,059.531    | NA           | 45.04                                |
| 2027               | 5,451.986                  | 1,543.689    | 3,908.297               | 2,448.311                       | 313.055              | 3,519.704    | 27.093    | 22,944.337    | 52,851.004    | 43.41         | 29,906.667    | NA           | 44.91                                |
| 2028               | 5,579.895                  | 1,612.394    | 3,967.501               | 2,505.751                       | 317.797              | 3,615.574    | 27.906    | 23,589.558    | 53,264.148    | 44.29         | 29,674.590    | NA           | 44.91                                |
| 2029               | 5,712.086                  | 1,682.338    | 4,029.748               | 2,565.113                       | 322.783              | 3,706.224    | 28.743    | 24,248.712    | 53,605.407    | 45.24         | 29,356.695    | NA           | 44.91                                |
| 2030               | 5,847.857                  | 1,753.121    | 4,094.736               | 2,626.083                       | 327.988              | 3,800.281    | 29.606    | 24,921.047    | 53,866.895    | 46.26         | 28,945.848    | NA           | 44.91                                |
| 2031               | 5,985.645                  | 1,825.475    | 4,160.169               | 2,687.960                       | 333.230              | 3,892.808    | 30.494    | 25,609.945    | 54,045.442    | 47.39         | 28,435.497    | NA           | 44.91                                |
| 2032               | 6,128.196                  | 1,900.647    | 4,227.548               | 2,751.975                       | 338.627              | 3,974.340    | 31.409    | 26,330.170    | 54,147.402    | 48.63         | 27,817.232    | NA           | 44.91                                |
| 2033               | 6,278.327                  | 1,979.042    | 4,299.285               | 2,819.394                       | 344.373              | 4,045.827    | 32.351    | 27,097.969    | 54,179.083    | 50.02         | 27,081.114    | NA           | 44.91                                |
| 2034               | 6,432.690                  | 2,059.837    | 4,372.853               | 2,888.713                       | 350.266              | 4,110.617    | 33.321    | 27,925.429    | 54,143.761    | 51.58         | 26,218.332    | NA           | 44.91                                |
| 2035               | 6,590.216                  | 2,142.939    | 4,447.277               | 2,959.453                       | 356.227              | 4,170.804    | 34.321    | 28,822.685    | 54,042.206    | 53.33         | 25,219.521    | NA           | 44.91                                |
| 2036               | 6,749.900                  | 2,227.354    | 4,522.546               | 3,031.162                       | 362.256              | 4,224.206    | 35.351    | 29,802.314    | 53,877.193    | 55.32         | 24,074.879    | NA           | 44.91                                |
| 2037               | 6,913.671                  | 2,314.908    | 4,598.763               | 3,104.706                       | 368.361              | 4,193.709    | 36.411    | 30,958.194    | 53,731.174    | 57.62         | 22,772.980    | NA           | 44.91                                |
| 2038               | 7,081.668                  | 2,404.768    | 4,676.901               | 3,180.148                       | 374.620              | 4,232.185    | 37.504    | 32,232.687    | 53,534.512    | 60.21         | 21,301.825    | NA           | 44.91                                |
| 2039               | 7,254.484                  | 2,496.113    | 4,758.371               | 3,257.754                       | 381.146              | 4,260.113    | 38.629    | 33,646.863    | 53,295.977    | 63.13         | 19,649.114    | NA           | 44.91                                |
| 2040               | 7,432.748                  | 2,590.542    | 4,842.206               | 3,337.807                       | 387.861              | 4,280.697    | 39.788    | 35,220.065    | 53,021.984    | 66.43         | 17,801.919    | NA           | 44.91                                |
| 2041               | 7,618.403                  | 2,686.842    | 4,931.561               | 3,421.178                       | 395.018              | 4,289.678    | 40.981    | 36,978.449    | 52,724.525    | 70.14         | 15,746.076    | NA           | 44.91                                |
| 2042               | 7,808.665                  | 2,784.286    | 5,024.380               | 3,506.619                       | 402.453              | 4,287.542    | 42.211    | 38,947.911    | 52,416.251    | 74.31         | 13,468.340    | NA           | 44.91                                |
| 2043               | 8,003.846                  | 2,883.260    | 5,120.585               | 3,594.268                       | 410.159              | 4,275.951    | 43.477    | 41,154.448    | 52,108.558    | 78.98         | 10,954.110    | NA           | 44.91                                |
| 2044               | 8,202.461                  | 2,984.064    | 5,218.397               | 3,683.460                       | 417.994              | 4,256.042    | 44.781    | 43,623.740    | 51,811.916    | 84.20         | 8,188.176     | NA           | 44.91                                |
| 2045               | 8,404.973                  | 3,087.065    | 5,317.909               | 3,774.402                       | 425.964              | 4,228.503    | 46.125    | 46,382.647    | 51,536.274    | 90.00         | 5,153.627     | NA           | 44.91                                |

<sup>1</sup> Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

<sup>2</sup> Excludes RSP contributions. Includes employer contributions.



**Table 19**  
**Additional Details – Total Normal Cost Dollars**  
(\$ in Millions)

| Fiscal<br>Year<br>Ending | Total Normal Cost <sup>1</sup> |            |          |            | Admin Expense |          |          |           | Normal Cost with Admin Expense |            |          |            |
|--------------------------|--------------------------------|------------|----------|------------|---------------|----------|----------|-----------|--------------------------------|------------|----------|------------|
|                          | Tier 2                         |            |          |            | Tier 2        |          |          |           | Tier 2                         |            |          |            |
|                          | Tier 1                         | Current    | Future   | Total      | Tier 1        | Current  | Future   | Total     | Tier 1                         | Current    | Future   | Total      |
| 2022                     | \$ 585.472                     | \$ 156.458 | \$ 0.000 | \$ 741.929 | \$ 14.345     | \$ 9.026 | \$ 0.000 | \$ 23.371 | \$ 599.816                     | \$ 165.484 | \$ 0.000 | \$ 765.300 |
| 2023                     | 554.673                        | 151.127    | 24.623   | 730.423    | 13.806        | 8.696    | 1.570    | 24.072    | 568.479                        | 159.823    | 26.193   | 754.495    |
| 2024                     | 524.885                        | 146.464    | 48.226   | 719.575    | 13.235        | 8.370    | 3.189    | 24.794    | 538.120                        | 154.834    | 51.415   | 744.369    |
| 2025                     | 495.712                        | 142.938    | 70.810   | 709.460    | 12.630        | 8.117    | 4.792    | 25.538    | 508.342                        | 151.055    | 75.602   | 734.999    |
| 2026                     | 467.498                        | 140.390    | 92.436   | 700.324    | 12.020        | 7.944    | 6.340    | 26.304    | 479.518                        | 148.334    | 98.776   | 726.628    |
| 2027                     | 440.440                        | 138.538    | 113.863  | 692.841    | 11.412        | 7.814    | 7.868    | 27.093    | 451.852                        | 146.351    | 121.731  | 719.934    |
| 2028                     | 414.452                        | 137.207    | 135.420  | 687.079    | 10.800        | 7.704    | 9.402    | 27.906    | 425.252                        | 144.911    | 144.823  | 714.986    |
| 2029                     | 388.794                        | 136.173    | 157.085  | 682.052    | 10.179        | 7.609    | 10.956   | 28.743    | 398.973                        | 143.781    | 168.041  | 710.795    |
| 2030                     | 363.038                        | 135.361    | 178.917  | 677.316    | 9.551         | 7.528    | 12.526   | 29.606    | 372.589                        | 142.889    | 191.443  | 706.921    |
| 2031                     | 337.156                        | 134.744    | 201.105  | 673.005    | 8.917         | 7.458    | 14.119   | 30.494    | 346.073                        | 142.201    | 215.224  | 703.498    |
| 2032                     | 311.225                        | 134.331    | 223.520  | 669.076    | 8.278         | 7.393    | 15.739   | 31.409    | 319.502                        | 141.723    | 239.259  | 700.484    |
| 2033                     | 285.960                        | 134.147    | 245.936  | 666.043    | 7.645         | 7.329    | 17.377   | 32.351    | 293.604                        | 141.476    | 263.312  | 698.392    |
| 2034                     | 261.478                        | 134.164    | 268.266  | 663.908    | 7.026         | 7.269    | 19.026   | 33.321    | 268.505                        | 141.433    | 287.292  | 697.230    |
| 2035                     | 237.116                        | 134.349    | 290.676  | 662.141    | 6.412         | 7.209    | 20.700   | 34.321    | 243.527                        | 141.559    | 311.376  | 696.462    |
| 2036                     | 212.551                        | 134.585    | 313.313  | 660.449    | 5.795         | 7.146    | 22.410   | 35.351    | 218.346                        | 141.730    | 335.722  | 695.798    |
| 2037                     | 187.795                        | 134.738    | 336.218  | 658.751    | 5.178         | 7.073    | 24.160   | 36.411    | 192.973                        | 141.810    | 360.378  | 695.161    |
| 2038                     | 163.165                        | 134.790    | 359.395  | 657.350    | 4.566         | 6.991    | 25.946   | 37.504    | 167.731                        | 141.781    | 385.341  | 694.853    |
| 2039                     | 139.457                        | 134.836    | 382.797  | 657.090    | 3.974         | 6.902    | 27.752   | 38.629    | 143.432                        | 141.738    | 410.549  | 695.719    |
| 2040                     | 117.279                        | 134.731    | 406.329  | 658.339    | 3.417         | 6.802    | 29.569   | 39.788    | 120.696                        | 141.532    | 435.898  | 698.126    |
| 2041                     | 97.548                         | 134.309    | 429.982  | 661.839    | 2.911         | 6.684    | 31.386   | 40.981    | 100.459                        | 140.993    | 461.368  | 702.820    |
| 2042                     | 80.799                         | 133.554    | 453.606  | 667.959    | 2.470         | 6.549    | 33.192   | 42.211    | 83.269                         | 140.103    | 486.797  | 710.169    |
| 2043                     | 66.586                         | 132.415    | 477.347  | 676.348    | 2.085         | 6.396    | 34.996   | 43.477    | 68.671                         | 138.811    | 512.343  | 719.825    |
| 2044                     | 54.613                         | 130.673    | 501.240  | 686.526    | 1.753         | 6.218    | 36.810   | 44.781    | 56.366                         | 136.892    | 538.050  | 731.308    |
| 2045                     | 44.511                         | 128.161    | 525.348  | 698.020    | 1.464         | 6.014    | 38.646   | 46.125    | 45.975                         | 134.175    | 563.995  | 744.145    |
| 2046                     | 36.004                         | 124.997    | 549.648  | 710.649    | 1.215         | 5.788    | 40.506   | 47.508    | 37.219                         | 130.785    | 590.154  | 758.158    |

<sup>1</sup> Normal Cost excludes expense portion.

Values may not add due to rounding.



**Table 20**  
**Additional Details – Normal Cost Rates**  
(\$ in Millions)

| Fiscal<br>Year<br>Ending | Expected Defined Benefit Plan Pay <sup>1</sup> |              |           |              | Total Normal Cost Rate <sup>1</sup> |         |        |        |                    | Employer Normal Cost Rate |        |        |
|--------------------------|--|--------------|-----------|--------------|-------------------------------------|---------|--------|--------|--------------------|---------------------------|--------|--------|
|                          | Tier 1   | Tier 2       |           | Total        | Tier 1                              | Tier 2  |        | Total  | Combined<br>Tier 2 | Tier 1                    | Tier 2 | Total  |
|                          |  | Current      | Future    |              |                                     | Current | Future |        |                    |                           |        |        |
| 2022                     | \$ 2,254.052                                   | \$ 1,418.260 | \$ 0.000  | \$ 3,672.312 | 26.61%                              | 11.67%  |        | 20.84% | 11.67%             | 18.60%                    | 3.66%  | 12.83% |
| 2023                     | 2,116.471                                      | 1,333.075    | 240.705   | 3,690.251    | 26.86%                              | 11.99%  | 10.88% | 20.45% | 11.82%             | 18.85%                    | 3.81%  | 12.44% |
| 2024                     | 1,985.238                                      | 1,255.590    | 478.363   | 3,719.191    | 27.11%                              | 12.33%  | 10.75% | 20.01% | 11.89%             | 19.10%                    | 3.88%  | 12.00% |
| 2025                     | 1,858.616                                      | 1,194.464    | 705.144   | 3,758.224    | 27.35%                              | 12.65%  | 10.72% | 19.56% | 11.93%             | 19.34%                    | 3.92%  | 11.55% |
| 2026                     | 1,737.456                                      | 1,148.181    | 916.414   | 3,802.051    | 27.60%                              | 12.92%  | 10.78% | 19.11% | 11.97%             | 19.59%                    | 3.96%  | 11.10% |
| 2027                     | 1,622.065                                      | 1,110.611    | 1,118.289 | 3,850.965    | 27.86%                              | 13.18%  | 10.89% | 18.69% | 12.03%             | 19.85%                    | 4.02%  | 10.68% |
| 2028                     | 1,511.753                                      | 1,078.366    | 1,316.122 | 3,906.241    | 28.13%                              | 13.44%  | 11.00% | 18.30% | 12.10%             | 20.12%                    | 4.09%  | 10.29% |
| 2029                     | 1,404.512                                      | 1,049.847    | 1,511.657 | 3,966.016    | 28.41%                              | 13.70%  | 11.12% | 17.92% | 12.17%             | 20.40%                    | 4.16%  | 9.91%  |
| 2030                     | 1,299.320                                      | 1,024.155    | 1,704.022 | 4,027.497    | 28.68%                              | 13.95%  | 11.23% | 17.55% | 12.25%             | 20.67%                    | 4.24%  | 9.54%  |
| 2031                     | 1,196.141                                      | 1,000.354    | 1,893.965 | 4,090.460    | 28.93%                              | 14.22%  | 11.36% | 17.20% | 12.35%             | 20.92%                    | 4.34%  | 9.19%  |
| 2032                     | 1,095.213                                      | 978.117      | 2,082.406 | 4,155.736    | 29.17%                              | 14.49%  | 11.49% | 16.86% | 12.45%             | 21.16%                    | 4.44%  | 8.85%  |
| 2033                     | 998.417  | 957.222      | 2,269.451 | 4,225.090    | 29.41%                              | 14.78%  | 11.60% | 16.53% | 12.55%             | 21.40%                    | 4.54%  | 8.52%  |
| 2034                     | 905.954  | 937.242      | 2,453.275 | 4,296.471    | 29.64%                              | 15.09%  | 11.71% | 16.23% | 12.64%             | 21.63%                    | 4.63%  | 8.22%  |
| 2035                     | 816.177  | 917.753      | 2,635.085 | 4,369.015    | 29.84%                              | 15.42%  | 11.82% | 15.94% | 12.75%             | 21.83%                    | 4.74%  | 7.93%  |
| 2036                     | 728.334  | 898.041      | 2,816.348 | 4,442.723    | 29.98%                              | 15.78%  | 11.92% | 15.66% | 12.85%             | 21.97%                    | 4.84%  | 7.65%  |
| 2037                     | 642.499  | 877.531      | 2,997.539 | 4,517.569    | 30.03%                              | 16.16%  | 12.02% | 15.39% | 12.96%             | 22.02%                    | 4.95%  | 7.38%  |
| 2038                     | 559.333  | 856.359      | 3,178.088 | 4,593.780    | 29.99%                              | 16.56%  | 12.12% | 15.13% | 13.07%             | 21.98%                    | 5.06%  | 7.12%  |
| 2039                     | 480.810  | 834.972      | 3,357.292 | 4,673.074    | 29.83%                              | 16.98%  | 12.23% | 14.89% | 13.17%             | 21.82%                    | 5.16%  | 6.88%  |
| 2040                     | 408.357  | 812.960      | 3,534.217 | 4,755.534    | 29.56%                              | 17.41%  | 12.33% | 14.68% | 13.28%             | 21.55%                    | 5.27%  | 6.67%  |
| 2041                     | 343.973  | 789.830      | 3,708.862 | 4,842.665    | 29.21%                              | 17.85%  | 12.44% | 14.51% | 13.39%             | 21.20%                    | 5.38%  | 6.50%  |
| 2042                     | 288.687  | 765.463      | 3,879.513 | 4,933.663    | 28.84%                              | 18.30%  | 12.55% | 14.39% | 13.50%             | 20.83%                    | 5.49%  | 6.38%  |
| 2043                     | 241.170  | 739.645      | 4,047.322 | 5,028.137    | 28.47%                              | 18.77%  | 12.66% | 14.32% | 13.60%             | 20.46%                    | 5.59%  | 6.31%  |
| 2044                     | 200.563  | 711.641      | 4,212.662 | 5,124.866    | 28.10%                              | 19.24%  | 12.77% | 14.27% | 13.71%             | 20.09%                    | 5.70%  | 6.26%  |
| 2045                     | 165.808  | 681.039      | 4,376.397 | 5,223.244    | 27.73%                              | 19.70%  | 12.89% | 14.25% | 13.80%             | 19.72%                    | 5.79%  | 6.24%  |
| 2046                     | 136.082  | 648.505      | 4,538.445 | 5,323.032    | 27.35%                              | 20.17%  | 13.00% | 14.24% | 13.90%             | 19.34%                    | 5.89%  | 6.23%  |

<sup>1</sup>Expected pay for members in the defined benefit plans at June 30. Used to develop normal cost as a percent of pay.

Values may not add due to rounding.



**Table 21**  
**Additional Details – Number of Members, Contributions and Payroll**  
(\$ in Millions)

| Fiscal Year Ending | RSP Total Active Members | Number of Defined Benefit Plan Active |         |        |        | Defined Benefit Plan Payroll <sup>1</sup> |              |           |              | Member Contributions |            |           |            |
|--------------------|--------------------------|---------------------------------------|---------|--------|--------|---|--------------|-----------|--------------|----------------------|------------|-----------|------------|
|                    |                          | Tier 2                                |         |        |        | Tier 2                                    |              |           |              | Tier 2               |            |           |            |
|                    |                          | Tier 1                                | Current | Future | Total  | Tier 1                                    | Current      | Future    | Total        | Tier 1               | Current    | Future    | Total      |
| 2021               | 13,046                   | 31,911                                | 28,486  | 0      | 60,397 | \$ 2,229.774                              | \$ 1,302.501 | \$ 0.000  | \$ 3,532.276 |                      |            |           | \$ 288.476 |
| 2022               | 14,268                   | 28,640                                | 25,025  | 5,510  | 59,175 | 2,137.294                                 | 1,332.087    | 230.982   | 3,700.363    | \$ 171.197           | \$ 106.700 | \$ 18.502 | 296.399    |
| 2023               | 15,486                   | 25,646                                | 21,796  | 10,515 | 57,957 | 2,008.212                                 | 1,255.482    | 459.991   | 3,723.685    | 160.858              | 100.564    | 36.845    | 298.267    |
| 2024               | 16,538                   | 22,961                                | 19,197  | 14,747 | 56,905 | 1,882.772                                 | 1,190.405    | 685.602   | 3,758.779    | 150.810              | 95.351     | 54.917    | 301.078    |
| 2025               | 17,269                   | 20,673                                | 17,474  | 18,027 | 56,174 | 1,761.849                                 | 1,142.133    | 899.018   | 3,803.000    | 141.124              | 91.485     | 72.011    | 304.620    |
| 2026               | 17,853                   | 18,640                                | 16,167  | 20,783 | 55,590 | 1,646.385                                 | 1,104.120    | 1,102.802 | 3,853.307    | 131.876              | 88.440     | 88.334    | 308.650    |
| 2027               | 18,374                   | 16,788                                | 15,052  | 23,229 | 55,069 | 1,536.444                                 | 1,071.772    | 1,300.081 | 3,908.297    | 123.070              | 85.849     | 104.136   | 313.055    |
| 2028               | 18,838                   | 15,101                                | 14,079  | 25,425 | 54,605 | 1,430.704                                 | 1,043.356    | 1,493.441 | 3,967.501    | 114.599              | 83.573     | 119.625   | 317.797    |
| 2029               | 19,252                   | 13,539                                | 13,224  | 27,428 | 54,191 | 1,326.460                                 | 1,017.710    | 1,685.578 | 4,029.748    | 106.249              | 81.519     | 135.015   | 322.783    |
| 2030               | 19,632                   | 12,095                                | 12,454  | 29,262 | 53,811 | 1,224.649                                 | 994.453      | 1,875.634 | 4,094.736    | 98.094               | 79.656     | 150.238   | 327.988    |
| 2031               | 19,983                   | 10,748                                | 11,764  | 30,948 | 53,460 | 1,124.081                                 | 972.425      | 2,063.663 | 4,160.169    | 90.040               | 77.891     | 165.299   | 333.230    |
| 2032               | 20,312                   | 9,516                                 | 11,135  | 32,480 | 53,131 | 1,026.601                                 | 951.969      | 2,248.978 | 4,227.548    | 82.231               | 76.253     | 180.143   | 338.627    |
| 2033               | 20,617                   | 8,396                                 | 10,553  | 33,877 | 52,826 | 934.134                                   | 932.349      | 2,432.802 | 4,299.285    | 74.825               | 74.681     | 194.867   | 344.373    |
| 2034               | 20,901                   | 7,366                                 | 10,020  | 35,156 | 52,542 | 845.088                                   | 913.573      | 2,614.192 | 4,372.853    | 67.692               | 73.177     | 209.397   | 350.266    |
| 2035               | 21,169                   | 6,411                                 | 9,519   | 36,344 | 52,274 | 757.811                                   | 894.912      | 2,794.554 | 4,447.277    | 60.701               | 71.682     | 223.844   | 356.227    |
| 2036               | 21,416                   | 5,526                                 | 9,049   | 37,452 | 52,027 | 672.491                                   | 875.670      | 2,974.385 | 4,522.546    | 53.867               | 70.141     | 238.248   | 362.256    |
| 2037               | 21,648                   | 4,706                                 | 8,595   | 38,494 | 51,795 | 589.114                                   | 855.346      | 3,154.303 | 4,598.763    | 47.188               | 68.513     | 252.660   | 368.361    |
| 2038               | 21,865                   | 3,951                                 | 8,164   | 39,463 | 51,578 | 509.042                                   | 834.667      | 3,333.192 | 4,676.901    | 40.774               | 66.857     | 266.989   | 374.620    |
| 2039               | 22,063                   | 3,281                                 | 7,753   | 40,346 | 51,380 | 434.857                                   | 813.837      | 3,509.677 | 4,758.371    | 34.833               | 65.188     | 281.125   | 381.146    |
| 2040               | 22,249                   | 2,689                                 | 7,356   | 41,149 | 51,194 | 366.709                                   | 791.742      | 3,683.755 | 4,842.206    | 29.373               | 63.419     | 295.069   | 387.861    |
| 2041               | 22,408                   | 2,198                                 | 6,970   | 41,867 | 51,035 | 308.514                                   | 768.540      | 3,854.507 | 4,931.561    | 24.712               | 61.560     | 308.746   | 395.018    |
| 2042               | 22,550                   | 1,790                                 | 6,587   | 42,516 | 50,893 | 258.198                                   | 743.887      | 4,022.295 | 5,024.380    | 20.682               | 59.585     | 322.186   | 402.453    |
| 2043               | 22,674                   | 1,452                                 | 6,209   | 43,108 | 50,769 | 215.264                                   | 717.777      | 4,187.544 | 5,120.585    | 17.243               | 57.494     | 335.422   | 410.159    |
| 2044               | 22,788                   | 1,171                                 | 5,829   | 43,655 | 50,655 | 178.492                                   | 688.736      | 4,351.169 | 5,218.397    | 14.297               | 55.168     | 348.529   | 417.994    |
| 2045               | 22,892                   | 940                                   | 5,445   | 44,166 | 50,551 | 147.041                                   | 657.491      | 4,513.377 | 5,317.909    | 11.778               | 52.665     | 361.521   | 425.964    |

<sup>1</sup> Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in the Tier 2 participating in the Traditional and Portable plans.

Values may not add due to rounding.



**Table 22**  
**Additional Details – Present Value of Future Benefits and Benefit Payments**  
(\$ in Millions)

| Fiscal Year Ending | Present Value of Future Benefits |                   |                |                |            |               | Benefit Payments |                   |                |                |          |              |
|--------------------|----------------------------------|-------------------|----------------|----------------|------------|---------------|------------------|-------------------|----------------|----------------|----------|--------------|
|                    | Current Retirees                 | Current Inactives | Tier 1 Actives | Tier 2 Actives |            | Total         | Current Retirees | Current Inactives | Tier 1 Actives | Tier 2 Actives |          | Total        |
|                    |                                  |                   |                | Current        | Future     |               |                  |                   |                | Current        | Future   |              |
| 2021               | \$ 33,661.717                    | \$ 3,081.538      | \$ 15,788.527  | \$ 2,711.727   | \$ 0.000   | \$ 55,243.509 |                  |                   |                |                |          | \$ 2,859.503 |
| 2022               | 32,951.000                       | 3,201.686         | 16,701.224     | 2,837.236      | 253.884    | 55,945.030    | \$ 2,808.878     | \$ 77.668         | \$ 110.038     | \$ 49.180      | \$ 0.000 | 3,045.764    |
| 2023               | 32,209.780                       | 3,315.412         | 17,605.516     | 2,967.975      | 528.542    | 56,627.225    | 2,793.671        | 91.458            | 175.668        | 52.017         | 1.578    | 3,114.392    |
| 2024               | 31,410.568                       | 3,424.758         | 18,488.868     | 3,108.535      | 825.474    | 57,258.203    | 2,803.179        | 102.865           | 252.916        | 50.735         | 5.834    | 3,215.529    |
| 2025               | 30,555.224                       | 3,528.755         | 19,341.023     | 3,261.493      | 1,143.347  | 57,829.842    | 2,807.233        | 114.935           | 338.784        | 47.574         | 12.093   | 3,320.619    |
| 2026               | 29,646.286                       | 3,625.779         | 20,161.779     | 3,426.965      | 1,482.976  | 58,343.785    | 2,805.291        | 128.243           | 422.883        | 45.083         | 20.507   | 3,422.007    |
| 2027               | 28,686.600                       | 3,714.653         | 20,946.669     | 3,606.718      | 1,844.935  | 58,799.575    | 2,797.217        | 142.251           | 509.333        | 41.667         | 29.236   | 3,519.704    |
| 2028               | 27,679.033                       | 3,791.843         | 21,691.722     | 3,803.041      | 2,227.941  | 59,193.580    | 2,783.167        | 159.171           | 597.372        | 36.933         | 38.931   | 3,615.574    |
| 2029               | 26,627.191                       | 3,856.112         | 22,393.523     | 4,016.721      | 2,633.886  | 59,527.433    | 2,762.608        | 176.553           | 686.210        | 32.479         | 48.374   | 3,706.224    |
| 2030               | 25,535.147                       | 3,905.855         | 23,044.966     | 4,244.824      | 3,062.850  | 59,793.642    | 2,735.312        | 194.677           | 779.210        | 31.962         | 59.120   | 3,800.281    |
| 2031               | 24,407.525                       | 3,939.332         | 23,641.430     | 4,484.964      | 3,515.502  | 59,988.753    | 2,701.005        | 213.572           | 873.517        | 34.664         | 70.050   | 3,892.808    |
| 2032               | 23,249.448                       | 3,957.400         | 24,177.201     | 4,733.928      | 4,000.551  | 60,118.528    | 2,659.494        | 230.612           | 969.896        | 41.239         | 73.099   | 3,974.340    |
| 2033               | 22,066.473                       | 3,960.174         | 24,651.007     | 4,991.596      | 4,518.932  | 60,188.182    | 2,610.677        | 246.569           | 1,063.686      | 48.487         | 76.408   | 4,045.827    |
| 2034               | 20,864.706                       | 3,945.726         | 25,060.856     | 5,257.905      | 5,072.058  | 60,201.251    | 2,554.378        | 263.433           | 1,155.504      | 56.342         | 80.960   | 4,110.617    |
| 2035               | 19,650.523                       | 3,913.147         | 25,400.894     | 5,532.786      | 5,661.438  | 60,158.788    | 2,490.715        | 280.091           | 1,248.965      | 64.810         | 86.223   | 4,170.804    |
| 2036               | 18,430.598                       | 3,861.657         | 25,666.826     | 5,816.046      | 6,289.073  | 60,064.200    | 2,419.804        | 296.364           | 1,342.191      | 74.005         | 91.842   | 4,224.206    |
| 2037               | 17,211.801                       | 3,869.968         | 25,854.849     | 6,107.116      | 6,957.102  | 60,000.836    | 2,341.873        | 235.174           | 1,434.436      | 84.277         | 97.949   | 4,193.709    |
| 2038               | 16,001.335                       | 3,866.187         | 25,959.829     | 6,405.294      | 7,666.122  | 59,898.767    | 2,257.035        | 247.415           | 1,526.747      | 95.722         | 105.266  | 4,232.185    |
| 2039               | 14,806.250                       | 3,850.749         | 25,981.567     | 6,710.025      | 8,416.504  | 59,765.095    | 2,165.888        | 258.472           | 1,614.021      | 108.153        | 113.579  | 4,260.113    |
| 2040               | 13,633.562                       | 3,822.723         | 25,918.581     | 7,020.427      | 9,209.778  | 59,605.071    | 2,068.913        | 269.698           | 1,697.488      | 121.852        | 122.746  | 4,280.697    |
| 2041               | 12,490.096                       | 3,782.737         | 25,773.332     | 7,335.076      | 10,046.442 | 59,427.683    | 1,966.734        | 279.521           | 1,773.234      | 137.288        | 132.901  | 4,289.678    |
| 2042               | 11,382.302                       | 3,731.595         | 25,549.197     | 7,652.376      | 10,928.667 | 59,244.137    | 1,860.147        | 287.813           | 1,840.527      | 154.536        | 144.519  | 4,287.542    |
| 2043               | 10,316.152                       | 3,669.928         | 25,249.092     | 7,970.618      | 11,857.750 | 59,063.540    | 1,750.019        | 294.791           | 1,900.024      | 173.609        | 157.508  | 4,275.951    |
| 2044               | 9,297.099                        | 3,597.838         | 24,876.971     | 8,287.472      | 12,836.156 | 58,895.536    | 1,637.232        | 301.006           | 1,950.905      | 194.999        | 171.900  | 4,256.042    |
| 2045               | 8,329.870                        | 3,516.104         | 24,437.770     | 8,599.635      | 13,865.788 | 58,749.167    | 1,522.827        | 305.811           | 1,992.469      | 219.500        | 187.896  | 4,228.503    |

Values may not add due to rounding.



**Table 23**  
**Additional Details – Actuarial Accrued Liability and Employer Normal Cost Dollars**  
(\$ in Millions)

| Fiscal Year Ending | Actuarial Accrued Liability |                   |                |                |           |               | Fiscal Year Ending | Employer Normal Cost Dollar |           |            |
|--------------------|-----------------------------|-------------------|----------------|----------------|-----------|---------------|--------------------|-----------------------------|-----------|------------|
|                    | Current Retirees            | Current Inactives | Tier 1 Actives | Tier 2 Actives |           | Total         |                    | Tier 1                      | Tier 2    | Total      |
|                    |                             |                   |                | Current        | Future    |               |                    |                             |           |            |
| 2021               | \$ 33,661.717               | \$ 3,081.538      | \$ 11,355.073  | \$ 800.152     | \$ 0.000  | \$ 48,898.480 | 2022               | \$ 428.619                  | \$ 40.282 | \$ 468.901 |
| 2022               | 32,951.000                  | 3,201.686         | 12,583.795     | 962.871        | 0.000     | 49,699.352    | 2023               | 407.621                     | 48.607    | 456.228    |
| 2023               | 32,209.780                  | 3,315.412         | 13,792.870     | 1,127.738      | 23.782    | 50,469.582    | 2024               | 387.310                     | 55.981    | 443.291    |
| 2024               | 31,410.568                  | 3,424.758         | 14,970.076     | 1,299.832      | 69.076    | 51,174.310    | 2025               | 367.218                     | 63.161    | 430.379    |
| 2025               | 30,555.224                  | 3,528.755         | 16,105.079     | 1,482.735      | 134.161   | 51,805.954    | 2026               | 347.642                     | 70.336    | 417.978    |
| 2026               | 29,646.286                  | 3,625.779         | 17,197.952     | 1,677.468      | 217.111   | 52,364.596    | 2027               | 328.782                     | 78.097    | 406.879    |
| 2027               | 28,686.600                  | 3,714.653         | 18,244.721     | 1,886.473      | 318.557   | 52,851.004    | 2028               | 310.653                     | 86.536    | 397.189    |
| 2028               | 27,679.033                  | 3,791.843         | 19,241.857     | 2,112.576      | 438.839   | 53,264.148    | 2029               | 292.724                     | 95.288    | 388.012    |
| 2029               | 26,627.191                  | 3,856.112         | 20,185.647     | 2,356.904      | 579.553   | 53,605.407    | 2030               | 274.495                     | 104.438   | 378.933    |
| 2030               | 25,535.147                  | 3,905.855         | 21,068.230     | 2,616.810      | 740.853   | 53,866.895    | 2031               | 256.033                     | 114.235   | 370.268    |
| 2031               | 24,407.525                  | 3,939.332         | 21,884.145     | 2,890.183      | 924.257   | 54,045.442    | 2032               | 237.271                     | 124.586   | 361.857    |
| 2032               | 23,249.448                  | 3,957.400         | 22,626.874     | 3,174.114      | 1,139.566 | 54,147.402    | 2033               | 218.779                     | 135.240   | 354.019    |
| 2033               | 22,066.473                  | 3,960.174         | 23,295.016     | 3,468.832      | 1,388.588 | 54,179.083    | 2034               | 200.813                     | 146.151   | 346.964    |
| 2034               | 20,864.706                  | 3,945.726         | 23,886.567     | 3,774.617      | 1,672.145 | 54,143.761    | 2035               | 182.826                     | 157.409   | 340.235    |
| 2035               | 19,650.523                  | 3,913.147         | 24,394.978     | 4,091.731      | 1,991.827 | 54,042.206    | 2036               | 164.479                     | 169.063   | 333.542    |
| 2036               | 18,430.598                  | 3,861.657         | 24,814.875     | 4,420.212      | 2,349.851 | 53,877.193    | 2037               | 145.785                     | 181.015   | 326.800    |
| 2037               | 17,211.801                  | 3,869.968         | 25,141.323     | 4,759.600      | 2,748.482 | 53,731.174    | 2038               | 126.957                     | 193.276   | 320.233    |
| 2038               | 16,001.335                  | 3,866.187         | 25,368.307     | 5,109.292      | 3,189.391 | 53,534.512    | 2039               | 108.599                     | 205.974   | 314.573    |
| 2039               | 14,806.250                  | 3,850.749         | 25,495.514     | 5,468.933      | 3,674.531 | 53,295.977    | 2040               | 91.323                      | 218.942   | 310.265    |
| 2040               | 13,633.562                  | 3,822.723         | 25,521.965     | 5,837.704      | 4,206.030 | 53,021.984    | 2041               | 75.747                      | 232.055   | 307.802    |
| 2041               | 12,490.096                  | 3,782.737         | 25,451.605     | 6,214.081      | 4,786.006 | 52,724.525    | 2042               | 62.587                      | 245.129   | 307.716    |
| 2042               | 11,382.302                  | 3,731.595         | 25,289.941     | 6,596.342      | 5,416.071 | 52,416.251    | 2043               | 51.428                      | 258.238   | 309.666    |
| 2043               | 10,316.152                  | 3,669.928         | 25,041.699     | 6,982.594      | 6,098.185 | 52,108.558    | 2044               | 42.069                      | 271.245   | 313.314    |
| 2044               | 9,297.099                   | 3,597.838         | 24,712.458     | 7,370.079      | 6,834.442 | 51,811.916    | 2045               | 34.197                      | 283.984   | 318.181    |
| 2045               | 8,329.870                   | 3,516.104         | 24,308.499     | 7,754.873      | 7,626.928 | 51,536.274    | 2046               | 29.454                      | 286.507   | 315.961    |

Values may not add due to rounding.



**Table 24**  
**Additional Details – Payroll and Payroll in Excess of Governor’s Pay**  
(\$ in Millions)

| Fiscal<br>Year<br>Ending | Defined Benefit Plan Payroll <sup>1</sup> |              |           |              | Defined Benefit Plan Payroll in Excess<br>of Governor's Pay <sup>2</sup> |          |           |
|--------------------------|---|--------------|-----------|--------------|--|----------|-----------|
|                          | Tier 1                                    | Tier 2       |           | Total        | Tier 1   | Tier 2   |           |
|                          |   | Current      | Future    |              |  | Current  | Total     |
| 2021                     | \$ 2,229.774                              | \$ 1,302.501 | \$ 0.000  | \$ 3,532.276 | \$ 54.838  | \$ 0.000 | \$ 54.838 |
| 2022                     | 2,137.294                                 | 1,332.087    | 230.982   | 3,700.363    | 69.709   | 0.000    | 69.709    |
| 2023                     | 2,008.212                                 | 1,255.482    | 459.991   | 3,723.685    | 65.716   | 0.000    | 65.716    |
| 2024                     | 1,882.772                                 | 1,190.405    | 685.602   | 3,758.779    | 63.905   | 0.000    | 63.905    |
| 2025                     | 1,761.849                                 | 1,142.133    | 899.018   | 3,803.000    | 61.942   | 0.000    | 61.942    |
| 2026                     | 1,646.385                                 | 1,104.120    | 1,102.802 | 3,853.307    | 59.851   | 0.000    | 59.851    |
| 2027                     | 1,536.444                                 | 1,071.772    | 1,300.081 | 3,908.297    | 58.249   | 0.000    | 58.249    |
| 2028                     | 1,430.704                                 | 1,043.356    | 1,493.441 | 3,967.501    | 56.402   | 0.000    | 56.402    |
| 2029                     | 1,326.460                                 | 1,017.710    | 1,685.578 | 4,029.748    | 54.375   | 0.000    | 54.375    |
| 2030                     | 1,224.649                                 | 994.453      | 1,875.634 | 4,094.736    | 52.326   | 0.000    | 52.326    |
| 2031                     | 1,124.081                                 | 972.425      | 2,063.663 | 4,160.169    | 49.963   | 0.000    | 49.963    |
| 2032                     | 1,026.601                                 | 951.969      | 2,248.978 | 4,227.548    | 47.704   | 0.000    | 47.704    |
| 2033                     | 934.134                                   | 932.349      | 2,432.802 | 4,299.285    | 45.330   | 0.000    | 45.330    |
| 2034                     | 845.088                                   | 913.573      | 2,614.192 | 4,372.853    | 43.002   | 0.000    | 43.002    |
| 2035                     | 757.811                                   | 894.912      | 2,794.554 | 4,447.277    | 40.447   | 0.000    | 40.447    |
| 2036                     | 672.491                                   | 875.670      | 2,974.385 | 4,522.546    | 37.728   | 0.000    | 37.728    |
| 2037                     | 589.114                                   | 855.346      | 3,154.303 | 4,598.763    | 34.821   | 0.000    | 34.821    |
| 2038                     | 509.042                                   | 834.667      | 3,333.192 | 4,676.901    | 31.788   | 0.000    | 31.788    |
| 2039                     | 434.857                                   | 813.837      | 3,509.677 | 4,758.371    | 28.819   | 0.000    | 28.819    |
| 2040                     | 366.709                                   | 791.742      | 3,683.755 | 4,842.206    | 25.782   | 0.000    | 25.782    |
| 2041                     | 308.514                                   | 768.540      | 3,854.507 | 4,931.561    | 22.968   | 0.000    | 22.968    |
| 2042                     | 258.198                                   | 743.887      | 4,022.295 | 5,024.380    | 20.254   | 0.000    | 20.254    |
| 2043                     | 215.264                                   | 717.777      | 4,187.544 | 5,120.585    | 17.793   | 0.000    | 17.793    |
| 2044                     | 178.492                                   | 688.736      | 4,351.169 | 5,218.397    | 15.507   | 0.000    | 15.507    |
| 2045                     | 147.041                                   | 657.491      | 4,513.377 | 5,317.909    | 13.390   | 0.000    | 13.390    |

<sup>1</sup> Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

<sup>2</sup> Governor’s pay is \$184,800 in 2022 and is projected to increase annually by 1.125 percent.

Values may not add due to rounding.



**Table 25**  
**Additional Details – Statutorily Required Employer Contributions**  
(\$ in Millions)

| Fiscal Year Ending | Applicable Employer Normal Cost Rates |        | Employer Normal Cost Contributions for Pay in Excess of the Governor's Pay <sup>1</sup> |          |          | Total Employer Contributions Required by Statute <sup>2</sup> |          |          |
|--------------------|---------------------------------------|--------|---|----------|----------|---|----------|----------|
|                    | Tier 1                                | Total  | Tier 1  | Tier 2   | Total    | Tier 1  | Tier 2   | Total    |
| 2023               | 18.60%                                | 12.83% |   |          | \$ 5.048 | \$ 0.000  | \$ 0.000 | \$ 5.048 |
| 2024               | 18.85%                                | 12.44% | \$ 9.198  | \$ 0.000 | 9.198    | 9.198   | 0.000    | 9.198    |
| 2025               | 19.10%                                | 12.00% | 8.784   | 0.000    | 8.784    | 8.784   | 0.000    | 8.784    |
| 2026               | 19.34%                                | 11.55% | 8.652   | 0.000    | 8.652    | 8.652   | 0.000    | 8.652    |
| 2027               | 19.59%                                | 11.10% | 8.494   | 0.000    | 8.494    | 8.494   | 0.000    | 8.494    |
| 2028               | 19.85%                                | 10.68% | 8.315   | 0.000    | 8.315    | 8.315   | 0.000    | 8.315    |
| 2029               | 20.12%                                | 10.29% | 8.204   | 0.000    | 8.204    | 8.204   | 0.000    | 8.204    |
| 2030               | 20.40%                                | 9.91%  | 8.053   | 0.000    | 8.053    | 8.053   | 0.000    | 8.053    |
| 2031               | 20.67%                                | 9.54%  | 7.866   | 0.000    | 7.866    | 7.866   | 0.000    | 7.866    |
| 2032               | 20.92%                                | 9.19%  | 7.664   | 0.000    | 7.664    | 7.664   | 0.000    | 7.664    |
| 2033               | 21.16%                                | 8.85%  | 7.401   | 0.000    | 7.401    | 7.401   | 0.000    | 7.401    |
| 2034               | 21.40%                                | 8.52%  | 7.145   | 0.000    | 7.145    | 7.145   | 0.000    | 7.145    |
| 2035               | 21.63%                                | 8.22%  | 6.863   | 0.000    | 6.863    | 6.863   | 0.000    | 6.863    |
| 2036               | 21.83%                                | 7.93%  | 6.570   | 0.000    | 6.570    | 6.570   | 0.000    | 6.570    |
| 2037               | 21.97%                                | 7.65%  | 6.220   | 0.000    | 6.220    | 6.220   | 0.000    | 6.220    |
| 2038               | 22.02%                                | 7.38%  | 5.817   | 0.000    | 5.817    | 5.817   | 0.000    | 5.817    |
| 2039               | 21.98%                                | 7.12%  | 5.357   | 0.000    | 5.357    | 5.357   | 0.000    | 5.357    |
| 2040               | 21.82%                                | 6.88%  | 4.856   | 0.000    | 4.856    | 4.856   | 0.000    | 4.856    |
| 2041               | 21.55%                                | 6.67%  | 4.347   | 0.000    | 4.347    | 4.347   | 0.000    | 4.347    |
| 2042               | 21.20%                                | 6.50%  | 3.825   | 0.000    | 3.825    | 3.825   | 0.000    | 3.825    |
| 2043               | 20.83%                                | 6.38%  | 3.350   | 0.000    | 3.350    | 3.350   | 0.000    | 3.350    |
| 2044               | 20.46%                                | 6.31%  | 2.901   | 0.000    | 2.901    | 2.901   | 0.000    | 2.901    |
| 2045               | 20.09%                                | 6.26%  | 2.503   | 0.000    | 2.503    | 2.503   | 0.000    | 2.503    |
| 2046               | 19.72%                                | 6.24%  | 2.140   | 0.000    | 2.140    | 2.140   | 0.000    | 2.140    |
| 2047               | 19.34%                                | 6.23%  | 1.813   | 0.000    | 1.813    | 1.813   | 0.000    | 1.813    |

<sup>1</sup> FY 2023 amount based on excess pay amount as provided by SURS and the total employer normal cost rate. Amounts in FY 2024 and thereafter based on excess pay amount projected by GRS and the employer normal cost rate by tier. SURS may want to consider having employer normal cost contributions be based on the normal cost rate by tier. 30% of future Tier 1 excess pay employer contributions that would have been calculated are not included because they are already assumed to be part of the federal and trust funds contributions.

<sup>2</sup> Projected employer contributions do not include 6% employer billing contributions. No additional assumption is made for earnings greater than 6% during the final average salary (FAS) period. The participant's employer is required to make contributions equal to the present value of the increase in benefits attributable to member pay increases in excess of 6% during the FAS period. These contributions are collected when the participant retires.

Values may not add due to rounding.



## **APPENDIX F**

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### **HISTORICAL SCHEDULES**

**Table 26**  
**Historical Schedule of Funding Status**  
(\$ in Thousands)

| As of June 30 | Actuarial Value<br>of Assets | AAL           | UAAL         | Funded Ratio | Payroll/DB* | UAAL as % of Payroll |
|---------------|------------------------------|---------------|--------------|--------------|-------------|----------------------|
| 2007          | \$ 15,985,730                | \$ 23,362,079 | \$ 7,376,349 | 68.43        | \$3,180,985 | 231.89 %             |
| 2008          | 14,586,325                   | 24,917,678    | 10,331,353   | 58.54        | 3,303,220   | 312.77               |
| 2009          | 11,032,973                   | 26,316,231    | 15,283,258   | 41.92        | 3,463,922   | 441.21               |
| 2009 **       | 14,281,998                   | 26,316,231    | 12,034,233   | 54.27        | 3,463,922   | 347.42               |
| 2010 ***      | 13,966,643                   | 30,120,427    | 16,153,784   | 46.37        | 3,491,071   | 462.72               |
| 2011          | 13,945,680                   | 31,514,336    | 17,568,656   | 44.25        | 3,460,838   | 507.64               |
| 2012          | 13,949,905                   | 33,170,216    | 19,220,311   | 42.06        | 3,477,166   | 552.76               |
| 2013          | 14,262,621                   | 34,373,104    | 20,110,483   | 41.49        | 3,533,858   | 569.08               |
| 2014 ***      | 15,844,714                   | 37,429,515    | 21,584,801   | 42.33        | 3,522,246   | 612.81               |
| 2015          | 17,104,607                   | 39,520,687    | 22,416,080   | 43.28        | 3,606,537   | 621.54               |
| 2016          | 17,701,646                   | 40,923,301    | 23,221,655   | 43.26        | 3,513,108   | 661.00               |
| 2017          | 18,594,326                   | 41,853,348    | 23,259,022   | 44.43        | 3,458,320   | 672.55               |
| 2018 ***      | 19,347,886                   | 45,258,751    | 25,910,865   | 42.75        | 3,470,226   | 746.66               |
| 2019          | 19,661,891                   | 46,443,937    | 26,782,046   | 42.33        | 3,506,650   | 763.75               |
| 2020          | 20,091,675                   | 47,580,470    | 27,488,795   | 42.23        | 3,642,617   | 754.64               |
| 2021          | 21,484,799                   | 48,898,480    | 27,413,681   | 43.94        | 3,638,244   | 753.49               |

AAL – Actuarial Accrued Liability.

UAAL – Unfunded Actuarial Accrued Liability.

\* Payroll is rolled forward with salary scale for one year and uses capped payroll for members hired on and after January 1, 2011.

\*\* Assets at Actuarial Value (Market Value through first 2009, then Actuarial Value).

\*\*\* Investment rate of return assumption decreased from 8.50 percent to 7.75 percent in plan year 2010, decreased from 7.75 percent to 7.25 percent in plan year 2014, decreased from 7.25 percent to 6.75 percent in plan year 2018, and decreased from 6.75 percent to 6.50 percent in plan year 2021.



**Table 27**  
**Historical Comparison of ARC and State Contributions**  
(\$ in Millions)

| Fiscal Year | (1)<br>Total Normal Cost | (2)<br>Amortization of UAAL | (3)<br>(1) + (2)<br>Total ADC | (4)<br>Member Contribution | (5)<br>(3) - (4)<br>Net State ARC* | (6)<br>Actual State Contribution | (7)<br>(6) / (5)<br>State Cont. as Percent of Net ARC |
|-------------|--------------------------|-----------------------------|-------------------------------|----------------------------|------------------------------------|----------------------------------|---|
| 2003        |                          |                             | \$ 843.8                      | \$ 246.3                   | \$ 597.5                           | \$ 285.3                         | 47.74 %   |
| 2004        |                          |                             | 934.8                         | 243.8                      | 691.0                              | 1,757.5                          | 254.36  |
| 2005        |                          |                             | 859.7                         | 251.9                      | 607.8                              | 285.4                            | 46.96   |
| 2006        |                          |                             | 914.9                         | 252.9                      | 662.0                              | 180.0                            | 27.19   |
| 2007        |                          |                             | 968.3                         | 262.4                      | 705.9                              | 261.1                            | 36.99   |
| 2008        |                          |                             | 971.6                         | 264.1                      | 707.5                              | 344.9                            | 48.75   |
| 2009        |                          |                             | 1,147.3                       | 273.3                      | 874.0                              | 451.6                            | 51.67   |
| 2010 **     |                          |                             | 1,278.3                       | 275.0                      | 1,003.3                            | 696.6                            | 69.43   |
| 2011 ***    | \$ 723.798               | \$ 795.427                  | 1,519.2                       | 260.2                      | 1,259.0                            | 773.6                            | 61.44   |
| 2012        | 700.972                  | 1,000.612                   | 1,701.584                     | 258.236                    | 1,443.348                          | 985.815                          | 68.30   |
| 2013        | 699.747                  | 1,094.681                   | 1,794.428                     | 245.141                    | 1,549.287                          | 1,401.481                        | 90.46   |
| 2014        | 698.225                  | 1,145.380                   | 1,843.605                     | 283.081                    | 1,560.524                          | 1,502.864                        | 96.31   |

\* ARC - Annual Required Contribution as defined in GASB Statements No. 25 and 27. The ARC is the Actuarially Determined Contribution ("ADC") net of member contributions.

\*\* Assets at Actuarial Value (Market Value through 2009, then Actuarial Value beginning with Fiscal Year 2010).

\*\*\* Investment rate of return assumption decreased from 8.50 percent to 7.75 percent in Fiscal Year 2011.

Beginning in Fiscal Year 2011, dollars are shown rounded to three decimal places.

Information beginning with Fiscal Year 2015 can be found in Table 11 of the report.



## Table 28

### Historical Schedule of Contributions

(\$ in Thousands)

| FY Ending<br>June 30, | Actuarially<br>Determined<br>Contribution | Actual<br>Contribution | Contribution<br>Deficiency<br>(Excess) | Covered<br>Payroll | Actual Contribution<br>as a % of<br>Covered Payroll |
|-----------------------|---|------------------------|--|--------------------|---|
| 2012                  | \$ 1,443,348                              | \$ 985,815             | \$ 457,533                             | \$ 3,477,166       | 28.35 %   |
| 2013                  | 1,549,287                                 | 1,401,481              | 147,806                                | 3,533,858          | 39.66   |
| 2014                  | 1,560,524                                 | 1,502,864              | 57,660                                 | 3,522,246          | 42.67   |
| 2015                  | 1,622,656                                 | 1,528,525              | 94,130                                 | 3,606,537          | 42.38   |
| 2016                  | 1,811,060                                 | 1,582,295              | 228,765                                | 3,513,108          | 45.04   |
| 2017                  | 1,864,843                                 | 1,650,551              | 214,292                                | 3,458,320          | 47.73   |
| 2018                  | 1,862,033                                 | 1,607,880              | 254,153                                | 3,470,226          | 46.33   |
| 2019                  | 2,239,366                                 | 1,642,054              | 597,312                                | 3,506,650          | 46.83   |
| 2020                  | 2,299,031                                 | 1,838,786              | 460,245                                | 3,642,617          | 50.48   |
| 2021                  | 2,303,266                                 | 1,978,743              | 324,523                                | 3,638,244          | 54.39   |

*For Fiscal Years 2015 and prior, the Actuarially Determined Contribution is equal to normal cost plus 30-year open period amortization of the unfunded actuarial accrued liability as a level percentage of total payroll.*

*For Fiscal Years 2016 and after, the Actuarially Determined Contribution is equal to net normal cost plus 29-year closed period amortization of the unfunded actuarial accrued liability (from June 30, 2016) as a level percentage of defined benefit plan pensionable (capped) payroll.*

*Covered employee payroll is equal to defined benefit payroll from the actuarial valuation as of the same date and rolled forward with one year of wage inflation.*



## **APPENDIX G**

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### **ACTUARIAL METHODS AND ASSUMPTIONS**

# Actuarial Methods and Assumptions

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## Projected Unit Credit Method

The Projected Unit Credit Method is mandated under Section 15-155 of the SURS Article of the Illinois Pension Code as the funding method to be used for SURS.

The concept of this method is that funding of benefits should occur as benefits are accrued (earned) by active members of SURS.

The Normal Cost (“NC”) for a fiscal year under this method is the actuarial present value of all benefits expected to be accrued during the fiscal year adjusted for future expected salary increases. The Actuarial Accrued Liability (“AAL”) under this method is the actuarial present value of all benefits accrued to the valuation date. To the extent that the assets of the fund are insufficient to cover the AAL, an Unfunded Actuarial Accrued Liability (“UAAL”) develops. Under the classical application of this method, the contribution for a year is the NC for that year plus an amount to amortize the UAAL.

## Funding Policy to Calculate Statutory Contributions

Under Section 15-155 of the Illinois Pension Code, the employer/State contribution is determined such that the assets of SURS reach 90% of the AAL by the end of FY 2045.

This contribution is determined as a level percentage of pay for all years except that the contribution rates through 2010 shall grade in equal steps to the desired level contribution rate. *We have assumed the contribution would be based on pensionable (capped) payroll for members hired on or after January 1, 2011 (“Tier 2 members”).* Pensionable pay does not include amounts in excess of the pay cap (\$116,740 in 2021 for Tier 2, increased by the lesser of 3% and 1/2 of the increase in CPI-U as measured in the preceding 12-month calendar year) that is applicable to members hired on or after January 1, 2011, participating in the defined benefit plans.

Public Act 100-0023 (Effective July 6, 2017) made the following changes to the SURS funding policy:

### State Contributions

- Requires the State to make additional contributions to SURS in FY 2018, FY 2019 and FY 2020 equal to 2 percent of the total payroll of each employee who participates in the Optional Hybrid Plan or who participates in the Tier 2 plan in lieu of the Optional Hybrid Plan.
- Requires any change in an actuarial assumption that increases or decreases the required State contribution to be implemented in equal annual amounts over a five-year period beginning in the State fiscal year in which the change first applies to the required State contribution.
  - For changes that first applied in FY 2014, FY 2015, FY 2016 or FY 2017, the impact is calculated based on a five-year period and the applicable portion is recognized during the remaining fiscal years in that five-year period.



# Actuarial Methods and Assumptions

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## Employer Contributions

- Requires employers to contribute the employer normal cost of the portion of an employee's earnings that exceeds the amount of salary set for the governor, for academic years beginning on or after July 1, 2017. (Applicable to Tier 1 and Tier 2 employees.)

Public Act 100-0587 (Effective June 4, 2018) made the following changes to the SURS funding policy:

## Employer Contributions

- For academic years beginning on or after July 1, 2018, and for earnings paid under a contract or collective bargaining agreement entered into, amended or renewed on or after the effective date of the amendatory Act (June 5, 2018), if a participant's earnings for any academic year with the same employer as the previous academic year used to determine the final average salary increased by more than 3.00%, then the participant's employer shall pay the System the present value of the increase in benefits resulting from the portion of the increase in earnings that is in excess of 3.00%. Prior to the effective date of Public Act 100-0587, the payment from employers was for pay increases in excess of 6.00%.

PA 101-0010 rescinded the change to 3% from PA 100-0587. Therefore, employers make contributions equal to the present value of the increase in benefit attributable to members who receive pay increases in excess of 6% during the final average salary (FAS) period.

The 6% employer billing rule is assumed to apply to all current and future Tier 1 and Tier 2 members.

## Statutory Contributions Related to the Optional Hybrid Plan

SURS is currently not moving forward with the implementation of the Optional Hybrid Plan (OHP) created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so. Therefore, contributions related to the OHP are not included in the actuarial valuation, including contributions for employer normal cost, additional 2 percent of payroll contributions and unfunded liability contributions.

## Phase In of the Financial Impact of Assumption Changes

On the following page is a table with the recognition schedule for the phase in of actuarial assumption changes required under Public Act 100-0023. The following actuarial assumption changes were made:

1. Beginning with the June 30, 2018 actuarial valuation, there were changes to the economic and demographic actuarial assumptions.
2. Beginning with the June 30, 2021 actuarial valuation, there were changes to the economic and demographic actuarial assumptions.



## Actuarial Methods and Assumptions

| Valuation Year Ending 6/30                     | 2020                         | 2021       | 2022   | 2023   | 2024   | 2025   |
|--|------------------------------|------------|--------|--------|--------|--------|
| Applicable Fiscal Year Ending 6/30             | 2022                         | 2023       | 2024   | 2025   | 2026   | 2027   |
|  | <b>\$ in Millions</b>        |            |        |        |        |        |
|  | <b>After Impact of Bonds</b> |            |        |        |        |        |
| Contribution Before Assumption Change:         |                              |            |        |        |        |        |
| (1) Contribution Dollar                        | \$ 2,142.0                   | \$ 2,159.5 |        |        |        |        |
| (2) Contribution Rate                          | 43.78%                       | 43.41%     |        |        |        |        |
| Contribution After Assumption Change:          |                              |            |        |        |        |        |
| (3) Contribution Dollar                        | 2,142.0                      | 2,146.5    |        |        |        |        |
| (4) Contribution Rate                          | 43.78%                       | 42.98%     |        |        |        |        |
| (5) Assumption Impact as Percentage of Payroll |                              |            |        |        |        |        |
| =(4)-(2)                                       | 0.00%                        | -0.43%     |        |        |        |        |
| (6) Assumption Change Impact Recognized        |                              |            |        |        |        |        |
| This Year (5 year recognition)                 |                              |            |        |        |        |        |
| (6a) From This Year                            | 0.00%                        | -0.09%     |        |        |        |        |
| (6b) From One Year Ago                         | 0.00%                        | 0.00%      | -0.09% |        |        |        |
| (6c) From Two Years Ago                        | 0.67%                        | 0.00%      | 0.00%  | -0.09% |        |        |
| (6d) From Three Years Ago                      | 0.00%                        | 0.67%      | 0.00%  | 0.00%  | -0.09% |        |
| (6e) From Four Years Ago                       | 0.00%                        | 0.00%      | 0.68%  | 0.00%  | 0.00%  | -0.07% |
| (6f) Total Recognized Assumption Change Impact | 0.67%                        | 0.58%      | 0.59%  | -0.09% | -0.09% | -0.07% |

### Contribution Related to Pay in Excess of Governor's Pay

Following is a table with the estimated contributions required under Public Act 100-0023 to be made by employers for pay in excess of the Governor's pay. (Information calculated and provided by SURS.)

| Year                         | \$ in Millions |  |  |                           |                         |                                     |                                  |
|------------------------------|----------------|--|--|---------------------------|-------------------------|-------------------------------------|----------------------------------|
|                              | Governor's Pay | Pay for Preceding Fiscal Year for Affected Members |  | Employer Normal Cost Rate | Excess Pay * ER NC Rate | Additional Adjustments <sup>1</sup> | Estimated Employer Contributions |
|                              |                | Excess Pay   |  |                           |                         |                                     |                                  |
| July 1, 2017 - June 30, 2018 | \$ 177,500     | \$ 46.831  |  | 12.46%                    | \$ 5.835                | \$ (1.579)                          | \$ 4.256                         |
| July 1, 2018 - June 30, 2019 | 177,500        | 47.193   |  | 12.29%                    | 5.800                   | (1.654)                             | 4.146                            |
| July 1, 2019 - June 30, 2020 | 177,500        | 55.726   |  | 13.02%                    | 7.256                   | (2.132)                             | 5.124                            |
| July 1, 2020 - June 30, 2021 | 177,500        | 60.295   |  | 12.70%                    | 7.657                   | (2.128)                             | 5.529                            |
| July 1, 2021 - June 30, 2022 | 181,700        | 58.515   |  | 12.32%                    | 7.209                   | (1.840)                             | 5.369                            |
| July 1, 2022 - June 30, 2023 | 184,800        | 54.838   |  | 12.83%                    | 7.036                   | (1.988)                             | 5.048                            |

<sup>1</sup> Additional adjustments for members with pay in excess of the Governor's pay whose employers' already make normal cost contributions.



# Actuarial Methods and Assumptions

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## Asset Valuation Method

Prior to the actuarial valuation as of June 30, 2009, market value of assets was used. Under Section 15-155(l) of the Illinois Pension Code, beginning with the actuarial valuation as of June 30, 2009, the asset value is the actuarial value of assets which is calculated by recognizing 20% of the investment gain or loss (the difference between the actual investment return and the expected investment return) on the market value of assets for each of the five following fiscal years. This method was not applied retroactively to recognize a portion of investment gains or losses from previous fiscal years.

Following is a table with the investment return assumption used in recent actuarial valuations.

| Valuation Date                      | Investment Return Assumption |
|-------------------------------------|------------------------------|
| Prior to June 30, 2010              | 8.50%                        |
| June 30, 2010 through June 30, 2013 | 7.75%                        |
| June 30, 2014 through June 30, 2017 | 7.25%                        |
| June 30, 2018 through June 30, 2020 | 6.75%                        |
| June 30, 2021                       | 6.50%                        |

# Actuarial Methods and Assumptions

## Actuarial Assumptions

### (Most Adopted Effective with the June 30, 2021, Actuarial Valuation)

Under Section 15-155(a) of the Illinois Pension Code, the Board adopts the assumptions after consultation with the actuary. All actuarial assumptions are expectations of future experience and are not market measures. The rationale for the actuarial assumptions may be found in the experience study report covering the period June 30, 2017 through June 30, 2021, issued to the Board of Trustees on June 1, 2021.

**Rate of Investment Return.** For all purposes under the system the rate of investment return is assumed to be 6.50% per annum beginning with the **June 30, 2021** actuarial valuation. This assumption is net of investment expenses.

**Price Inflation (Increase in Consumer Price Index "CPI").** The assumed rate is 2.25% per annum.

**Effective Rate of Interest.** The actuarial valuation assumed rate credited to member accounts is 6.50% per annum, beginning with the June 30, 2021 actuarial valuation.

**Cost of Living Adjustment "Automatic Annual Increase (AAI)."** The assumed rate is 3.00% per annum based on the benefit provision of 3.00% annual compound increases for members hired before January 1, 2011, who have not elected the AAI buyout and 1.50% simple (non-compound) increases for members who have elected the buyout. The assumed rate is 1.125% for members hired on or after January 1, 2011, based on the benefit provision of increases equal to ½ of the increase in CPI-U with a maximum increase of 3.00%.

**Annual Compensation Increases.** Each member's compensation is assumed to increase by 3.00% each year, 2.25% reflecting salary inflation and 0.75% reflecting standard of living increases. That rate is increased for members with less than 35 years of service to reflect merit, longevity and promotion increases. The rates are based on service at the beginning of the year and are as follows:

| Service Year | Total Increase |              |
|--------------|----------------|--------------|
|              | Under Age 50   | 50 and Older |
| 0            | 12.75%         | 12.00%       |
| 1            | 12.75%         | 12.00%       |
| 2            | 9.00%          | 8.25%        |
| 3            | 7.75%          | 7.00%        |
| 4            | 6.75%          | 6.00%        |
| 5            | 6.25%          | 5.50%        |
| 6            | 6.00%          | 5.25%        |
| 7            | 5.50%          | 4.75%        |
| 8-10         | 5.00%          | 4.25%        |
| 11-14        | 4.50%          | 3.75%        |
| 15-18        | 4.25%          | 3.50%        |
| 19           | 4.00%          | 3.25%        |
| 20-33        | 3.75%          | 3.25%        |
| 34+          | 3.50%          | 3.00%        |



## Actuarial Methods and Assumptions

**General Wage Inflation.** The assumed rate of general wage inflation is 3.00%.

**Mortality.** The mortality assumptions are as follows:

Members classified as an employee type of academic:

| Applicable Group               | Base Mortality Table   | Male Scaling Factor | Female Scaling Factor |
|--------------------------------|--|---------------------|-----------------------|
| Pre-retirement                 | Pub-2010 Employee Mortality Table (for Teachers)                     | 101%                | 97%                   |
| Post-retirement (non-disabled) | Pub-2010 Healthy Retiree Mortality Table (for Teachers)              | 99%                 | 105%                  |
| Post-retirement (disabled)     | Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees) | 112%                | 110%                  |

Members classified as an employee type of non-academic:

| Applicable Group               | Base Mortality Table   | Male Scaling Factor | Female Scaling Factor |
|--------------------------------|--|---------------------|-----------------------|
| Pre-retirement                 | Pub-2010 Employee Mortality Table (for General Employees)            | 114%                | 105%                  |
| Post-retirement (non-disabled) | Pub-2010 Healthy Retiree Mortality Table (for General Employees)     | 99%                 | 107%                  |
| Post-retirement (disabled)     | Pub-2010 Disabled Retiree Mortality Table (for Non-Safety Employees) | 112%                | 110%                  |

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the Society of Actuaries (SOA) MP-2020 projection scale. The assumptions are generational mortality tables and include a margin for improvement.

Following are the future life expectancies for post-retirement (non-disabled) mortality:

| Age | Future Life Expectancy (years) in 2021 |        |              |        | Future Life Expectancy (years) in 2035 |        |              |        |
|-----|--|--------|--------------|--------|--|--------|--------------|--------|
|     | Academic                               |        | Non-Academic |        | Academic                               |        | Non-Academic |        |
|     | Male                                   | Female | Male         | Female | Male                                   | Female | Male         | Female |
| 35  | 53.42                                  | 55.17  | 51.01        | 53.34  | 54.48                                  | 56.13  | 52.30        | 54.46  |
| 40  | 48.18                                  | 49.91  | 45.74        | 48.04  | 49.23                                  | 50.88  | 47.03        | 49.17  |
| 45  | 42.94                                  | 44.67  | 40.51        | 42.76  | 43.99                                  | 45.64  | 41.77        | 43.88  |
| 50  | 37.74                                  | 39.44  | 35.39        | 37.59  | 38.78                                  | 40.41  | 36.63        | 38.70  |
| 55  | 32.61                                  | 34.31  | 30.50        | 32.64  | 33.65                                  | 35.27  | 31.70        | 33.72  |
| 60  | 27.65                                  | 29.37  | 25.79        | 27.82  | 28.65                                  | 30.29  | 26.92        | 28.84  |
| 65  | 22.90                                  | 24.57  | 21.31        | 23.14  | 23.82                                  | 25.42  | 22.32        | 24.07  |
| 70  | 18.38                                  | 19.90  | 17.06        | 18.65  | 19.19                                  | 20.67  | 17.93        | 19.48  |
| 75  | 14.18                                  | 15.49  | 13.15        | 14.46  | 14.87                                  | 16.17  | 13.87        | 15.17  |



## Actuarial Methods and Assumptions

**Disability.** A table of disability incidence with rates follows:

| Age        | Academic  |           | Non-Academic |           |
|------------|-----------|-----------|--------------|-----------|
|            | Male      | Female    | Male         | Female    |
| 20         | 0.007410% | 0.016400% | 0.027170%    | 0.037720% |
| 21         | 0.007590% | 0.017350% | 0.027830%    | 0.039905% |
| 22         | 0.007770% | 0.018300% | 0.028490%    | 0.042090% |
| 23         | 0.007950% | 0.019250% | 0.029150%    | 0.044275% |
| 24         | 0.008130% | 0.020200% | 0.029810%    | 0.046460% |
| 25         | 0.008310% | 0.021150% | 0.030470%    | 0.048645% |
| 26         | 0.008490% | 0.022100% | 0.031130%    | 0.050830% |
| 27         | 0.008670% | 0.023050% | 0.031790%    | 0.053015% |
| 28         | 0.008850% | 0.024050% | 0.032450%    | 0.055315% |
| 29         | 0.009000% | 0.025000% | 0.033000%    | 0.057500% |
| 30         | 0.009450% | 0.027050% | 0.034650%    | 0.062215% |
| 31         | 0.009900% | 0.029100% | 0.036300%    | 0.066930% |
| 32         | 0.010350% | 0.031150% | 0.037950%    | 0.071645% |
| 33         | 0.010770% | 0.033200% | 0.039490%    | 0.076360% |
| 34         | 0.011220% | 0.035250% | 0.041140%    | 0.081075% |
| 35         | 0.011850% | 0.037250% | 0.043450%    | 0.085675% |
| 36         | 0.012450% | 0.039300% | 0.045650%    | 0.090390% |
| 37         | 0.013080% | 0.041350% | 0.047960%    | 0.095105% |
| 38         | 0.013710% | 0.043400% | 0.050270%    | 0.099820% |
| 39         | 0.014310% | 0.045450% | 0.052470%    | 0.104535% |
| 40         | 0.016080% | 0.047500% | 0.058960%    | 0.109250% |
| 41         | 0.017850% | 0.049550% | 0.065450%    | 0.113965% |
| 42         | 0.019620% | 0.051600% | 0.071940%    | 0.118680% |
| 43         | 0.021390% | 0.053650% | 0.078430%    | 0.123395% |
| 44         | 0.023160% | 0.055700% | 0.084920%    | 0.128110% |
| 45         | 0.025350% | 0.057750% | 0.092950%    | 0.132825% |
| 46         | 0.027570% | 0.059800% | 0.101090%    | 0.137540% |
| 47         | 0.029790% | 0.061850% | 0.109230%    | 0.142255% |
| 48         | 0.031980% | 0.063900% | 0.117260%    | 0.146970% |
| 49         | 0.034200% | 0.065950% | 0.125400%    | 0.151685% |
| 50         | 0.036420% | 0.068000% | 0.133540%    | 0.156400% |
| 51         | 0.038610% | 0.070050% | 0.141570%    | 0.161115% |
| 52         | 0.040830% | 0.072100% | 0.149710%    | 0.165830% |
| 53         | 0.043050% | 0.074150% | 0.157850%    | 0.170545% |
| 54         | 0.045240% | 0.076200% | 0.165880%    | 0.175260% |
| 55 & Older | 0.046560% | 0.078250% | 0.170720%    | 0.179975% |

Disability rates apply during the retirement eligibility period.

Members are assumed to first receive disability benefits (DB) and then receive disability retirement annuity (DRA) benefits.



## Actuarial Methods and Assumptions

**Retirement.** Upon eligibility, active members are assumed to retire as follows:

| Age      | Tier 1                        |           |                |           |                            |              |
|----------|-------------------------------|-----------|----------------|-----------|----------------------------|--------------|
|          | Normal (Unreduced) Retirement |           |                |           | Early (Reduced) Retirement |              |
|          | Academic                      |           | Non-Academic   |           | Academic                   | Non-Academic |
|          | Under 40 Years                | 40+ Years | Under 40 Years | 40+ Years |                            |              |
| Under 50 | 55.0%                         |           | 55.0%          |           |                            |              |
| 50       | 55.0%                         |           | 40.0%          |           |                            |              |
| 51       | 40.0%                         |           | 30.0%          |           |                            |              |
| 52       | 40.0%                         |           | 30.0%          |           |                            |              |
| 53       | 30.0%                         |           | 30.0%          |           |                            |              |
| 54       | 30.0%                         |           | 30.0%          |           |                            |              |
| 55       | 20.0%                         | 30.0%     | 25.0%          | 37.5%     | 7.0%                       | 4.0%         |
| 56       | 20.0%                         | 30.0%     | 25.0%          | 37.5%     | 5.5%                       | 4.0%         |
| 57       | 20.0%                         | 30.0%     | 25.0%          | 37.5%     | 4.0%                       | 4.0%         |
| 58       | 20.0%                         | 30.0%     | 25.0%          | 37.5%     | 5.0%                       | 4.0%         |
| 59       | 20.0%                         | 30.0%     | 25.0%          | 37.5%     | 5.5%                       | 4.0%         |
| 60       | 13.0%                         | 19.5%     | 20.0%          | 30.0%     |                            |              |
| 61       | 13.0%                         | 19.5%     | 15.0%          | 22.5%     |                            |              |
| 62       | 13.0%                         | 19.5%     | 15.0%          | 22.5%     |                            |              |
| 63       | 13.0%                         | 19.5%     | 15.0%          | 22.5%     |                            |              |
| 64       | 13.0%                         | 19.5%     | 15.0%          | 22.5%     |                            |              |
| 65       | 17.0%                         | 25.5%     | 25.0%          | 37.5%     |                            |              |
| 66       | 17.0%                         | 25.5%     | 25.0%          | 37.5%     |                            |              |
| 67       | 17.0%                         | 25.5%     | 25.0%          | 37.5%     |                            |              |
| 68       | 17.0%                         | 25.5%     | 25.0%          | 37.5%     |                            |              |
| 69       | 17.0%                         | 25.5%     | 25.0%          | 37.5%     |                            |              |
| 70       | 17.0%                         | 25.5%     | 20.0%          | 30.0%     |                            |              |
| 71-79    | 15.0%                         | 22.5%     | 20.0%          | 30.0%     |                            |              |
| 80+      | 100.0%                        | 100.0%    | 100.0%         | 100.0%    |                            |              |

*The Non-Academic retirement rates apply to Police and Firefighters.*



## Actuarial Methods and Assumptions

| Tier 2 |                               |              |        |                            |              |
|--------|-------------------------------|--------------|--------|----------------------------|--------------|
| Age    | Normal (Unreduced) Retirement |              |        | Early (Reduced) Retirement |              |
|        | Academic                      | Non-Academic | Police | Academic                   | Non-Academic |
| 60     |                               |              | 60.0%  |                            |              |
| 61     |                               |              | 25.0%  |                            |              |
| 62     |                               |              | 25.0%  | 25.0%                      | 35.0%        |
| 63     |                               |              | 25.0%  | 10.0%                      | 15.0%        |
| 64     |                               |              | 25.0%  | 10.0%                      | 15.0%        |
| 65     |                               |              | 15.0%  | 10.0%                      | 15.0%        |
| 66     |                               |              | 15.0%  | 10.0%                      | 15.0%        |
| 67     | 35.0%                         | 35.0%        | 15.0%  |                            |              |
| 68     | 17.0%                         | 25.0%        | 25.0%  |                            |              |
| 69     | 17.0%                         | 25.0%        | 25.0%  |                            |              |
| 70     | 17.0%                         | 20.0%        | 20.0%  |                            |              |
| 71-79  | 15.0%                         | 20.0%        | 20.0%  |                            |              |
| 80+    | 100.0%                        | 100.0%       | 100.0% |                            |              |

*A rate equal to 1.5 times the Tier 2 rate shown is used if the member has 40 or more years of service and is younger than 80 years old. The Tier 2 rates shown above are for members with less than 40 years of service.*

Members who retire are assumed to elect the most valuable option on a present value basis – refund of contributions (or portable lump sum retirement, if applicable) or a retirement annuity.

For purposes of the projections in the actuarial valuation, members of the Retirement Savings Plan are assumed to retire in accordance with the Tier 1 and Tier 2 retirement rates (based on hire date).

## Actuarial Methods and Assumptions

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**General Turnover.** A table of termination rates based on the most recent experience study period. The assumption is a table of turnover rates by years of service. A sample of these rates follows:

| Years of Service | Academic | Non-Academic |
|------------------|----------|--------------|
| 0                | 15.00%   | 15.00%       |
| 1                | 15.00    | 15.00        |
| 2                | 12.00    | 15.00        |
| 3                | 11.00    | 14.00        |
| 4                | 10.00    | 12.00        |
| 5                | 9.00     | 10.00        |
| 6                | 8.00     | 9.00         |
| 7                | 7.00     | 8.00         |
| 8                | 6.00     | 7.00         |
| 9                | 5.00     | 6.00         |
| 10               | 4.00     | 5.00         |
| 11               | 4.00     | 5.00         |
| 12               | 3.00     | 3.50         |
| 13               | 3.00     | 3.50         |
| 14               | 3.00     | 3.50         |
| 15               | 2.50     | 3.00         |
| 16               | 2.50     | 3.00         |
| 17               | 2.50     | 3.00         |
| 18               | 2.50     | 3.00         |
| 19               | 2.50     | 3.00         |
| 20               | 2.00     | 2.00         |
| 21               | 2.00     | 2.00         |
| 22               | 2.00     | 2.00         |
| 23               | 2.00     | 2.00         |
| 24               | 2.00     | 2.00         |
| 25               | 1.50     | 1.50         |
| 26               | 1.50     | 1.50         |
| 27               | 1.50     | 1.50         |
| 28               | 1.50     | 1.50         |
| 29               | 1.50     | 1.50         |

A termination rate of 100 percent is assumed at three years of service for members classified as part time for valuation purposes.

Members who terminate with at least five years of service (10 years of service for Tier 2 members) are assumed to elect the most valuable option on a present value basis – refund of contributions or a deferred benefit.

Termination rate for 29 years of service used for Tier 2 members until retirement eligibility is met.



## Actuarial Methods and Assumptions

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**Operational Expenses.** The amount of operational expenses for administration incurred in the latest fiscal year are supplied by SURS staff and incorporated in the Normal Cost. Estimated administrative expenses for FY 2023 and after are assumed to increase by 3.00%.

**Marital Status.** Members are assumed to be married in the following proportions:

| Age   | Males | Females |
|-------|-------|---------|
| 20-24 | 10 %  | 25 %    |
| 25-29 | 35    | 45      |
| 30-34 | 60    | 65      |
| 35-39 | 70    | 70      |
| 40-44 | 75    | 75      |
| 45-49 | 80    | 75      |
| 50-54 | 80    | 75      |
| 55-59 | 80    | 75      |
| 60-64 | 80    | 70      |
| 65-69 | 80    | 70      |
| 70-74 | 80    | 70      |
| 75-79 | 80    | 70      |
| 80-84 | 80    | 70      |
| 85-89 | 80    | 70      |

**Spouse Age.** The female spouse is assumed to be three years younger than the male spouse.

**Benefit Commencement Age.** Inactive members eligible for a deferred benefit are assumed to commence benefits at their earliest normal retirement age. For Tier 1 members this is age 62 with at least five years of service, age 60 with at least eight years of service or immediately if at least 30 years of service. For Tier 2 members, this is age 67 with 10 or more years of service.

**Load on Final Average Salary.** No load is assumed to account for higher than assumed pay increases in final years of employment before retirement.

**Load on Liabilities for Service Retirees With Non-finalized Benefits.** A load of 10% on liabilities for service retirees whose benefits have not been finalized as of the valuation date is assumed to account for finalized benefits that on average are 10% higher than 100% of the preliminary estimated benefit. A load of 5% is used if a “best formula” benefit was provided in the data by Staff.

**Valuation of Inactives.** An annuity benefit is estimated based on information provided by staff for Tier 1 inactive members with five or more years of service and Tier 2 members with 10 or more years of service.

**Assumption for Missing Data.** Members with an unknown gender are assumed to be female. Active and inactive members with an unknown date of birth are assumed to be 37 years old at the valuation date. An assumed spouse date of birth is calculated for current service retirees in the traditional plan for



## Actuarial Methods and Assumptions

purposes of calculating future survivor benefits. The female spouse is assumed to be three years younger than the male spouse. 70% of current total male retirees and 80% of current total female retirees in the traditional plan who have not elected a survivor refund are assumed to have a spouse at the valuation date.

**Reciprocal Service.** Reciprocal service is included for current inactive members for purposes of determining vesting eligibility and eligibility age to commence benefits.

The recently updated actuarial assumptions (including retirement and termination rates) were based on SURS service only. Therefore, reciprocal service was not included for current active members.

**Projection Assumptions.** The number of total active members throughout the projection period will remain the same as the total number of active members in the defined benefit plans and the RSP in the current valuation.

Future new hires are assumed to elect to participate in the offered plans as follows:

- Academic
  - 45% elect to participate in the Retirement Savings Plan
  - 55% elect to participate in the Tier 2 Plan
- Non-Academic
  - 25% elect to participate in the Retirement Savings Plan
  - 75% elect to participate in the Tier 2 Plan

New entrants have an average age of 36.8 and average capped pay of \$43,292 and average uncapped pay of \$45,565 (2021 dollars). These values are based on the average age and average pay of current members. The new entrant data is based on the age at hire and assumed pay at hire (using the actuarial assumptions, inflated to 2021 dollars) of current active members with service between one and four years.

### Academic

| Summary of New Entrants - Academic |              |                 |                 |                |                 |                 |              |                 |                 |
|------------------------------------|--------------|-----------------|-----------------|----------------|-----------------|-----------------|--------------|-----------------|-----------------|
| Age                                | Number Males | Average Pay     |                 | Number Females | Average Pay     |                 | Total Number | Average Pay     |                 |
|                                    |              | Tier 2          | Tier 2          |                | Tier 2          | Tier 2          |              |                 |                 |
|                                    |              | Capped Male     | Uncapped Male   |                | Capped Female   | Uncapped Female |              | Capped Total    | Uncapped Total  |
| <20                                | 2            | \$46,423        | \$46,423        | 2              | \$34,714        | \$34,714        | 4            | \$40,568        | \$40,568        |
| 20 - 24                            | 74           | 28,716          | 28,716          | 96             | 30,642          | 30,642          | 170          | 29,804          | 29,804          |
| 25 - 29                            | 308          | 45,082          | 48,422          | 393            | 42,895          | 44,061          | 701          | 43,856          | 45,977          |
| 30 - 34                            | 427          | 59,409          | 66,698          | 574            | 51,395          | 56,549          | 1,001        | 54,814          | 60,878          |
| 35 - 39                            | 424          | 53,116          | 61,094          | 475            | 47,854          | 51,967          | 899          | 50,336          | 56,272          |
| 40 - 44                            | 266          | 52,270          | 62,487          | 300            | 43,204          | 47,122          | 566          | 47,465          | 54,343          |
| 45 - 49                            | 191          | 43,273          | 49,475          | 212            | 40,229          | 44,675          | 403          | 41,672          | 46,950          |
| 50 - 54                            | 141          | 45,309          | 54,497          | 151            | 39,231          | 43,161          | 292          | 42,166          | 48,635          |
| 55 - 59                            | 122          | 44,509          | 52,812          | 130            | 33,093          | 36,664          | 252          | 38,620          | 44,482          |
| 60 - 64                            | 90           | 33,655          | 44,608          | 79             | 30,968          | 35,193          | 169          | 32,399          | 40,207          |
| 65 - 69                            | 10           | 23,525          | 25,224          | 2              | 8,223           | 8,223           | 12           | 20,975          | 22,391          |
| <b>Total</b>                       | <b>2,055</b> | <b>\$49,267</b> | <b>\$56,438</b> | <b>2,414</b>   | <b>\$44,026</b> | <b>\$47,704</b> | <b>4,469</b> | <b>\$46,436</b> | <b>\$51,721</b> |

## Actuarial Methods and Assumptions

### Non-Academic

| Summary of New Entrants - Non-Academic |                 |                 |                  |                   |                  |                    |                 |                 |                   |
|--|-----------------|-----------------|------------------|-------------------|------------------|--------------------|-----------------|-----------------|-------------------|
| Age                                    | Number<br>Males | Average Pay     |                  | Number<br>Females | Average Pay      |                    | Total<br>Number | Average Pay     |                   |
|  |                 | Tier 2          |                  |                   | Tier 2           |                    |                 | Tier 2          |                   |
|  |                 | Capped<br>Male  | Uncapped<br>Male |                   | Capped<br>Female | Uncapped<br>Female |                 | Capped<br>Total | Uncapped<br>Total |
| <20                                    | 45              | \$21,401        | \$21,401         | 47                | \$19,229         | \$19,229           | 92              | \$20,291        | \$20,291          |
| 20 - 24                                | 646             | 32,652          | 32,652           | 1,094             | 30,919           | 30,919             | 1,740           | 31,562          | 31,562            |
| 25 - 29                                | 1,239           | 41,746          | 41,818           | 1,866             | 40,292           | 40,390             | 3,105           | 40,872          | 40,960            |
| 30 - 34                                | 976             | 47,297          | 48,817           | 1,449             | 43,226           | 43,898             | 2,425           | 44,865          | 45,878            |
| 35 - 39                                | 598             | 50,844          | 52,562           | 1,089             | 43,879           | 44,588             | 1,687           | 46,347          | 47,414            |
| 40 - 44                                | 466             | 50,584          | 52,709           | 794               | 44,319           | 45,626             | 1,260           | 46,636          | 48,246            |
| 45 - 49                                | 419             | 49,900          | 53,695           | 719               | 42,414           | 44,169             | 1,138           | 45,170          | 47,676            |
| 50 - 54                                | 353             | 48,657          | 52,190           | 553               | 40,681           | 42,475             | 906             | 43,789          | 46,260            |
| 55 - 59                                | 253             | 50,351          | 58,875           | 423               | 39,922           | 42,725             | 676             | 43,825          | 48,769            |
| 60 - 64                                | 120             | 49,463          | 59,239           | 165               | 38,119           | 42,040             | 285             | 42,895          | 49,282            |
| 65 - 69                                | 4               | 66,862          | 66,862           | 5                 | 20,099           | 20,099             | 9               | 40,882          | 40,882            |
| <b>Total</b>                           | <b>5,119</b>    | <b>\$45,115</b> | <b>\$47,021</b>  | <b>8,204</b>      | <b>\$40,443</b>  | <b>\$41,302</b>    | <b>13,323</b>   | <b>\$42,238</b> | <b>\$43,500</b>   |

**RSP Contribution Assumptions.** The projected RSP contributions are equal to 7.6% of RSP payroll, plus estimated RSP expenses minus RSP employer forfeitures. Estimated RSP expenses for FY 2022 are \$1,043,478 and actual FY 2021 RSP employer forfeitures used to reduce the certified contributions for FY 2023 are \$7,175,000 (as provided by SURS). Estimated RSP expenses for FY 2023 and after are assumed to increase by 3.00%. Estimated RSP employer forfeitures used to reduce the certified contributions for FY 2024 and after are assumed to be 7.5% of the gross RSP employer contribution.

**Pensionable Earnings Greater than 6%.** The participant's employer is required to pay the present value of the increase in benefits resulting from the portion of the increase in excess of 6.00% for earnings used in the calculation of the final average salary. The projections include a component paid for by employers for earnings increases greater than 6.00% in the calculation of the final average salary.

**Governor's Pay.** The governor's pay is \$181,700 as of June 30, 2021, and budgeted as \$184,800 as of June 30, 2022, and is expected to increase each year by the assumed rate of increase in the Tier 2 pay cap (1/2 the increase in CPI or 1.125%).

## Actuarial Methods and Assumptions

**Buyout Election Assumption.** 0% of eligible Tier 1 active members are assumed to elect to receive a reduced and delayed AAI benefit at retirement and an accelerated pension benefit option in accordance with Public Acts 100-0587 and 101-0010. 0% of eligible inactive members are assumed to elect to receive an accelerated pension benefit option in lieu of an annuity at retirement in accordance with Public Acts 100-0587 and 101-0010.

|                                     | Through 5/31/2020 |            |              | Through 6/30/2021 |            |              |
|-------------------------------------|-------------------|------------|--------------|-------------------|------------|--------------|
|                                     | <u>AAI</u>        | <u>VIB</u> | <u>Total</u> | <u>AAI</u>        | <u>VIB</u> | <u>Total</u> |
| Number Eligible for the buyout*     | 2,454             | 23,669     | 26,123       | 5,765             | 23,669     | 29,434       |
| Buyout applications received        | 80                | 59         | 139          | 221               | 94         | 315          |
| Buyout election forms sent          | 22                | 31         | 53           | 106               | 67         | 173          |
| Buyout election forms approved      | 14                | 19         | 33           | 72                | 42         | 114          |
| Application %                       | 3.3%              | 0.2%       | 0.5%         | 3.8%              | 0.4%       | 1.1%         |
| Approved %                          | 0.6%              | 0.1%       | 0.1%         | 1.2%              | 0.2%       | 0.4%         |
| Approved buyout amount**            | \$1.4             | \$3.0      | \$4.3        | \$6.8             | \$17.5     | \$24.3       |
| Estimated Approved buyout (non EBA) | \$1.4             | \$3.0      | \$4.3        | \$6.8             | \$ 9.1     | \$15.9       |
| Estimated Liability Reduction       | \$2.0             | \$4.9      | \$6.9        | \$9.6             | \$15.2     | \$24.8       |

\* Number eligible for the VIB buyout is the number of vested Tier 1 inactive members included in the actuarial valuation as of June 30, 2019 who are in the Traditional or Portable Plan.

\*\* Includes amounts attributable to benefits that would have been payable from the Excess Benefit Arrangement (EBA). There was one \$11.2 million VIB buyout of which \$8.4 million was payable from the EBA.

**Treatment of Benefits in Excess of the Internal Revenue Code Section 415 Limits.** The benefit amounts in excess of the IRC Section 415 limits for current retirees are paid through the Excess Benefit Arrangement (EBA) and are not reported in the actuarial valuation data. Therefore, the liabilities and the required contributions for these EBA benefits are not reflected in the actuarial valuation results. The amount of the estimated EBA payments for the upcoming fiscal year are provided by SURS Staff and included in the Statutory contribution requirement. Following are the estimates used in the previous and current valuations:

| Valuation Year | Applicable Fiscal Year | Estimated EBA Payments |
|----------------|------------------------|------------------------|
| 2018           | 2020                   | \$17.065 million       |
| 2019           | 2021                   | \$18.000 million       |
| 2020           | 2022                   | \$21.500 million       |
| 2021           | 2023                   | \$24.200 million       |



## Actuarial Methods and Assumptions

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**Estimated Federal/Trust Fund Employer Contributions.** Following are the estimated employer contributions provided by SURS that reduce the estimated State contributions.

| Valuation Year | Applicable Fiscal Year | Estimated Federal/Trust Fund Payments |
|----------------|------------------------|---------------------------------------|
| 2018           | 2020                   | \$52.0 million                        |
| 2019           | 2021                   | \$52.5 million                        |
| 2020           | 2022                   | \$57.0 million                        |
| 2021           | 2023                   | \$62.0 million                        |

## **APPENDIX H**

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### **SUMMARY OF BENEFIT PROVISIONS OF SURS**

## Summary of Benefit Provisions of SURS

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It should be noted that the purpose of this Appendix is to describe the benefit structures of SURS for which actuarial values have been generated. There is no description of the Retirement Savings Plan (RSP) and many portions of the defined plans are described in a manner which may not be legally complete or precise.

It is not our intent to provide an exhaustive description of all benefits provided under SURS or the policies and procedures utilized by SURS staff. A more precise description of the provisions of SURS is contained in the Member's Guide, published by SURS staff. Of course, the statute is controlling.



# Summary of Benefit Provisions of SURS

## Plans

There are two defined benefit plans available under SURS, the Traditional Plan and the Portable Plan, and one defined contribution plan, the Retirement Savings Plan (RSP). A Member must select one of these plans within the first six months of participation. If no choice is made in that time, the Traditional Plan is deemed chosen. Effective September 1, 2020 the Retirement Savings Plan (RSP) has been renamed the Retirement Savings Plan (RSP).

New tiers of benefits have been established for members hired on or after January 1, 2011 (“Tier 2”). Members hired before January 1, 2011, participate in Tier 1. Members in Tiers 1 and 2 are eligible to choose either the Traditional or the Portable Plan. **SURS is currently not moving forward with the implementation of the optional hybrid plan created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so.**

Tier 2 members who participate in the Traditional and Portable Plans are subject to the pay caps established under Public Act 96-0889. The Tier 2 pay cap was \$106,800 in 2011 and increases by the lesser of (1) 3% and (2) ½ the increase in the Consumer Price Index-Urban (“CPI-U”) for the 12 months ending with the September proceeding each November 1.

The pay cap history is as follows:

| Year | CPI-U | ½ CPI-U | Tier 2 Pensionable Pay Cap |
|------|-------|---------|----------------------------|
| 2011 |       |         | \$106,800.00               |
| 2012 | 3.90% | 1.95%   | \$108,882.60               |
| 2013 | 2.00% | 1.00%   | \$109,971.43               |
| 2014 | 1.20% | 0.60%   | \$110,631.26               |
| 2015 | 1.70% | 0.85%   | \$111,571.63               |
| 2016 | 0.00% | 0.00%   | \$111,571.63               |
| 2017 | 1.50% | 0.75%   | \$112,408.42               |
| 2018 | 2.20% | 1.10%   | \$113,644.91               |
| 2019 | 2.30% | 1.15%   | \$114,951.83               |
| 2020 | 1.70% | 0.85%   | \$115,928.92               |
| 2021 | 1.40% | 0.70%   | \$116,740.42               |

The Tier 2 pay cap is calculated annually by the Illinois Department of Insurance.

The Retirement Savings Plan is a defined contribution plan under which members contribute 8.0% of compensation and the State contributes 7.6% of compensation. A portion of the employer contribution is used to fund disability benefits for RSP participants. Members hired on or after January 1, 2011, who participate in the RSP are not subject to the Tier 2 pay cap.

The provisions of the Traditional and Portable defined benefit plans are identical in many areas. The description below is primarily of the Traditional Plan. Where different, the Portable plan provisions will be described in *italics*.



# Summary of Benefit Provisions of SURS

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## Member Contributions

Most members in Tier 1 and Tier 2 contribute a total of 8% of pensionable compensation. Police officers and firefighters contribute a total of 9.5% of pensionable compensation, with the additional 1.5% allocated to the retirement annuity.

The total contribution is broken down as follows:

|                                | Tier 1 and Tier 2 |            |
|--------------------------------|-------------------|------------|
|                                | Police/Fire       | All Others |
| Retirement Annuity             | 8.0%              | 6.5%       |
| Survivor Benefits              | 1.0%              | 1.0%       |
| Annual Increases in Retirement | 0.5%              | 0.5%       |
| Total Contribution             | 9.5%              | 8.0%       |

*Portable Plan members contribute the same percent of compensation, but the breakdown set out above does not apply.*

The retirement annuity portion of the total contribution (8.0% of compensation for police officers and firefighters and 6.5% of compensation for all others) is annuitized for the money purchase formula (Rule 2) calculation for Tier 1 members.

Contributions for Tier 2 members are assumed not to be made on pay in excess of the pay cap.

Since January 1, 1981, the member contributions under SURS have been “picked up” for IRS purposes by employers.

## Effective Rate of Interest

The Effective Rate of Interest (“ERI”) is the interest rate that is applied to member contribution balances. Effective for the 2006 fiscal year, the ERI for the purpose of determining the money purchase benefit is established by the State Comptroller annually. The ERI for other purposes such as the calculation of purchases of service credit, refunds for excess contributions, portable plan refunds and lump sum portable retirements is determined by the SURS Board annually and certified to the Governor. For purposes of the actuarial valuation, the assumed ERI is 6.50% beginning with the actuarial valuation as of June 30, 2021.

For the purposes of withdrawal of contributions at termination or death by Traditional Plan Members, this rate is not greater than 4.5% by statute.



# Summary of Benefit Provisions of SURS

## Retirement Benefits

### Final Average Salary

Final average salary is equal to:

|               |  |
|---------------|--|
| <b>Tier 1</b> | High four consecutive year average compensation or the average of the last 48 consecutive months of employment.  |
| <b>Tier 2</b> | High final eight consecutive year average compensation within the last 10 years or the average of the last 96 consecutive months within the last 120 months. |

The Tier 2 pay cap history is shown in a table earlier in this section. We have assumed that the pay cap each year applies to the individual pay amounts that are used to develop the final average compensation.

The present value of the benefits for pay increases in excess of 6% during the final average earnings period immediately preceding retirement will be paid by the employer. The employer will pay this amount in a lump sum to the Retirement System.

### Normal Retirement

#### Eligibility

For police officers and firefighters, separation from service on or after the attainment of the earlier of:

| <b>Tier 1</b>              | <b>Tier 2</b>              |
|----------------------------|----------------------------|
| Age 55/20 Years of Service | Age 60/20 Years of Service |
| Age 50/25 Years of Service | Age 67/10 Years of Service |

For all other Tier 1 and Tier 2 members, separation from service on or after attainment of the earlier of:

| <b>Tier 1</b>               | <b>Tier 2</b>              |
|-----------------------------|----------------------------|
| Age 62/5 Years of Service   | Age 67/10 Years of Service |
| Age 60/8 Years of Service   |                            |
| Any age/30 Years of Service |                            |

#### Initial Benefit Amount

There are three alternate formulae. The initial benefit is the largest produced by one of the three:

1. General Formula (Applicable to all Tiers)
2. Money Purchase Formula (Applicable to Tier 1 only, hired before July 1, 2005)
3. Minimum Benefit (Applicable to all Tiers)

Following is a description of the benefits provided under each of the three alternate formulae.



## Summary of Benefit Provisions of SURS

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1. General Formula (Applicable to all Tiers): The following percentages of final average compensation for each year of service:

| Year of Service          | Tier 1 and Tier 2 |             |
|--------------------------|-------------------|-------------|
|                          | General           | Police/Fire |
| 1 <sup>st</sup> 10 Years | 2.20 %            | 2.25 %      |
| Next 10 Years            | 2.20              | 2.50        |
| Over 20                  | 2.20              | 2.75        |

2. Money Purchase Formula (Applicable to Tier 1 only, hired before July 1, 2005):
- The member contributions for retirement benefits (8.0% of compensation for police officers and firefighters and 6.5% of compensation for all others) accumulated with interest at the ERI, plus
  - An imputed employer contribution match at \$1.40 per dollar of member contribution accumulated with interest at the ERI.
  - The total of the accumulations in (a) and (b) is converted into an annuity using a life annuity factor that takes into account neither the automatic 50% spousal survivor benefit nor the automatic annual increases.

Members hired on or after July 1, 2005 no longer receive the Money Purchase Formula under the plan.

3. Minimum Benefit (Applicable to all Tiers) – A benefit for each year of service, up to 30, based on final annual pay, as follows:

|                   |      |
|-------------------|------|
| Under 3,500       | \$ 8 |
| \$3,500 - \$4,500 | 9    |
| \$4,500 - \$5,500 | 10   |
| \$5,500 - \$6,500 | 11   |
| \$6,500 - \$7,500 | 12   |
| \$7,500 - \$8,500 | 13   |
| \$8,500 - \$9,500 | 14   |
| Over \$9,500      | 15   |

Minimum Retirement Annuity – No retiree shall receive a retirement annuity less than \$25 per month for each year of service up to 30. The comparable benefit for survivor benefit recipients is \$17.50 per month for each year of service up to 30.

### Maximum Benefit

All Tiers have a maximum benefit equal to 80% of final average compensation.

Contribution waivers are applicable to members whose benefits are capped at 80% of final



## Summary of Benefit Provisions of SURS

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average compensation. Member contributions made once the maximum benefit is achieved are refunded to the member with interest (at the Effective Rate of Interest).

### Benefit Duration

The Normal Retirement benefit is payable for the lifetime of the retired member. If the retiree under the Traditional Plan has a spouse at date of retirement and if that spouse survives the retiree, the spouse will receive, upon the death of the retiree, a survivor benefit equal to the following percentage of the monthly benefit being paid to the retiree as of the date of death.

1. The survivor benefit for Tier 1 members is equal to 50% of the monthly benefit being paid to the retiree as of the date of death.
2. The survivor benefit for Tier 2 members is equal to 66 2/3% of the monthly benefit being paid to the retiree as of the date of death.

Such benefit will continue for the lifetime of the surviving spouse.

*For retirees under the Portable Plan, the normal form of benefit is a single-life annuity for unmarried participants and a reduced 50% joint and survivor benefit for married participants. With spousal consent, a member may designate a contingent annuitant to receive a joint and survivor annuity or elect a single-life annuity or lump sum distribution. Those receiving a joint and survivor annuity will have their benefit reduced to cover the cost of the option. The available joint and survivor options are 50%, 75% and 100%. A member may elect the 75% or 100% spousal joint and survivor annuity without consent.*

*Portable Plan members may also elect to receive their retirement benefit as a lump sum equal to member contributions with an equal employer match (if have the required years of service), accumulated with interest (at the Effective Rate of Interest that is certified annually by the SURS Board).*

*The required years of service is five years for all plans. (Must have 10 years if retirement age.)*

### Annual Increases

For Tier 1 members who have not elected the Automatic Annual Increase (AAI) buyout, each January 1 subsequent to retirement date, the monthly benefit being paid each retiree shall be increased by 3% (compound COLA). The adjustment for the first January after retirement shall be proportional based on the portion of the year retired. See page 84 for a description of the increase for members who have elected the AAI buyout.

For Tier 2 members, each January 1 subsequent to retirement date, the monthly benefit being paid each retiree shall be increased by fifty percent of the Consumer Price Index-Urban ("CPI-U") up to a maximum of 3% applied to the original benefit (simple COLA). The first increase will be granted upon the later of the attainment of age 67 or the first anniversary of the commencement of the annuity.



## Summary of Benefit Provisions of SURS

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The historical development of the Tier 2 Annual Increase as determined by the Illinois Department of Insurance can be found in the following table.

| Year | CPI-U | ½ CPI-U | Annual Increase |
|------|-------|---------|-----------------|
| 2011 |       |         | 3.00%           |
| 2012 | 3.90% | 1.95%   | 1.95%           |
| 2013 | 2.00% | 1.00%   | 1.00%           |
| 2014 | 1.20% | 0.60%   | 0.60%           |
| 2015 | 1.70% | 0.85%   | 0.85%           |
| 2016 | 0.00% | 0.00%   | 0.00%           |
| 2017 | 1.50% | 0.75%   | 0.75%           |
| 2018 | 2.20% | 1.10%   | 1.10%           |
| 2019 | 2.30% | 1.15%   | 1.15%           |
| 2020 | 1.70% | 0.85%   | 0.85%           |
| 2021 | 1.40% | 0.70%   | 0.70%           |

### Early Retirement

#### Eligibility

For Tier 1 members other than police and fire employees, separation from service on or after attainment of age 55 with 8 years of service, but not eligible for Normal Retirement.

For Tier 2 members, separation from service on or after attainment of age 62 with 10 years of service, but not eligible for Normal Retirement.

#### Benefits

The benefit amounts and all terms of benefit payment are the same as that for Normal Retirement, except that the benefit amounts calculated under the General Formula and the Minimum Formula shall be reduced by .5% for each month by which the retirement date precedes the 60<sup>th</sup> birthday for Tier 1 members and the 67<sup>th</sup> birthday for Tier 2 members.

## Benefits on Death before Retirement

### Survivor Benefits

#### Traditional Plan

##### Eligibility

Payable to eligible survivor(s) (spouse, child or dependent parent) for the death of an active member with at least 1.5 years of service or a terminated member with at least 10 years of service. For this purpose, service under the State Employees' Retirement System, the Teachers' Retirement System of the State of Illinois and the Public School Teachers' Pension Fund of Chicago is recognized.



# Summary of Benefit Provisions of SURS

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## Benefits

For Tier 1 members, an annuity to the eligible survivor(s) equal to the greater of:

1. 50% of the benefit accrued to the date of the death of the member, and
2. The lowest applicable benefit from the following list:
  - a) \$400 per month to a single eligible survivor or \$600 per month to two or more eligible survivors.
  - b) 30% (one survivor), or 60% (two survivors), or 80% (three or more survivors) of the member's final rate of earnings.
  - c) If member inactive, 80% of base retirement annuity.

For Tier 2 members, an annuity to the survivor(s) equal to 66 2/3% of the benefit accrued to the date of the death of the member.

Supplemental Minimum Survivor Annuity of \$17.50 per month times number of years of service credit, up to 30 years. No annual increases payable on the supplemental minimum survivor annuity.

## Benefit Duration

### *Surviving spouse*

May receive a lifetime benefit commencing at the later of the day following the member's date of death and the spouse's attainment of age 50. May be payable the day following the member's date of death if a dependent child in their care is also receiving benefits.

### *Dependent child*

Payable to unmarried child(ren) under age 18 (over 18 if disabled prior to age 18), and children age 18-22 if a qualified full-time student.

### *Dependent parent*

Payable to a parent of the member who was dependent upon the member at the time of their death. Payable at the later of the day following the member's date of death and the parent's attainment of age 55. The benefit continues until the parent dies.

## Annual Increases

For Tier 1 members, each January 1 subsequent to retirement date the monthly benefit being paid each survivor annuity recipient shall be increased by 3%. The first increase begins with the first January closest to the first anniversary of the survivor annuity.

For Tier 2 members, each January 1 subsequent to retirement date the monthly benefit being paid each survivor annuity recipient shall be increased fifty percent of the Consumer Price Index-Urban ("CPI-U") up to a maximum of 3% of the originally granted survivor annuity (simple COLA). The first increase will be granted upon January 1 following the first anniversary of the commencement of the survivor annuity.



# Summary of Benefit Provisions of SURS

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## Portable Plan

### Eligibility

Payable to an eligible spouse for the death of an active or inactive member with at least 1.5 years of SURS service.

### Benefits

An annuity to the eligible spouse equal to 50% of the member's earned retirement benefit after the reductions to pay for the cost of providing the pre-retirement survivor annuity. (Applicable to Tier 1 and Tier 2 members.)

### Benefit Duration

#### *Surviving spouse*

May receive a lifetime benefit commencing at the member's earliest retirement age.

### Annual Increases

For members hired before January 1, 2011 and for all members hired on or after January 1, 2011, each January 1 subsequent to retirement date the monthly benefit being paid each survivor annuity recipient shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

## Lump Sum Death Benefit

### Eligibility

Death of member prior to retirement.

## Traditional Plan

### Benefit

#### With Eligible Survivor

- $\frac{7}{8}$ <sup>ths</sup> of accumulated member contributions balance (includes all contributions and interest)

#### Without Eligible Survivor

- Refund of the total accumulated member contribution and interest; and
- An amount up to \$5,000 based on the annual final average earnings amount to a dependent beneficiary or \$2,500 to a non-dependent beneficiary. The additional death benefit is only



## Summary of Benefit Provisions of SURS

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payable if the member was active at death. If the member was inactive, this additional death benefit is not payable.

### Portable Plan

#### Benefit

##### With Eligible Spouse

- Refund of total accumulated member contributions at the full Effective Rate of Interest, plus, if the member has at least 1.5 years of service at death, a like amount of imputed employer contributions – less the actuarial equivalent of the Pre-Retirement Survivor Annuity.

##### Without Eligible Spouse

- Refund of total accumulated member contributions at the full Effective Rate of Interest, plus, if the member has at least 1.5 years of service at death, a like amount of imputed employer contributions.

## Benefits on Death after Retirement

In addition to survivor/spouse benefits payable from the System, the following death benefit is payable if a member does not have an eligible survivor/spouse/contingent annuitant:

- The greater of the total accumulated member contributions and interest minus the total retirement annuities paid to the member through the date of their death or \$1,000.

#### Eligibility

Payable to eligible survivor(s) (spouse, child or dependent parent) as long as the member did not take a refund of their survivor contributions at retirement.

### Traditional Plan

#### Benefits

For Tier 1 members, an annuity to the eligible survivor(s) equal to the greater of:

1. 50% of the annuity at the time of the member's death.
2. The lowest applicable benefit from the following list:
  - a) \$400 per month to a single eligible survivor or \$600 per month to two or more eligible survivors.
  - b) 30% (one survivor), or 60% (two survivors), or 80% (three or more survivors) of the member's final rate of earnings.
  - c) 80% of base retirement annuity.



## Summary of Benefit Provisions of SURS

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For Tier 2 members, an annuity to the survivor(s) equal to 66 2/3% of retirement annuity at the time of the member's death.

Supplemental Minimum Survivor Annuity of \$17.50 per month times number of years of service credit, up to 30 years. No annual increases payable on the supplemental minimum survivor annuity.

### Benefit Duration

#### *Surviving spouse*

May receive a lifetime benefit commencing at the later of the day following the member's date of death and the spouse's attainment of age 50. May be payable the day following the members' date of death if a dependent child in their care is also receiving benefits.

#### *Dependent child*

Payable to unmarried child(ren) under age 18 (over 18 if disabled prior to age 18), and children age 18-22 if a qualified full-time student.

#### *Dependent parent*

Payable to a parent of the member who was dependent upon the member at the time of their death. Payable at the later of the day following the member's date of death and the parent's attainment of age 55. The benefit continues until the parent dies.

## Portable Plan

### Benefits

A 50%, 75% or 100% Joint and Survivor annuity is payable to the Contingent Annuitant that the member chose at the time of retirement, if any. The member's retirement annuity is reduced to pay for the Joint and Survivor Annuity.

### Benefit Duration

#### *Surviving spouse*

May receive a lifetime benefit commencing at the member's earliest retirement age.

### Annual Increases

For members hired before January 1, 2011, and for all members hired on or after January 1, 2011,



## Summary of Benefit Provisions of SURS

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each January 1 on or after the survivor annuity shall be increased by 3% compounded. The first AAI begins with the January 1 on or after the commencement of the survivor annuity if retired January 14, 1991 or later. If the member retired prior to January 14, 1991, then January 1 on or closest to the 1st anniversary of the Survivor Annuity shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

### Benefits for Disability

#### Disability Benefit

##### Eligibility

Disablement after completing two years of service. The service requirement is waived if the disablement is accidental.

Disability definition – inability to perform the duties of “own occupation.”

Pregnancy and childbirth are, by definition, disablement.

##### Benefit

The greater of 50% of the basic compensation paid at date of disablement or 50% of the average earnings for the 24 months prior to the date of disablement. This base benefit level is offset dollar for dollar by each of the following:

1. Earnings while disabled in excess of the disability benefit.
2. Other disability insurance either fully or partially employer provided.
3. Worker’s compensation benefits.

##### Duration of Benefit

Benefits become payable on the later of the termination of salary and sick leave, or the 61<sup>st</sup> day after disablement and continue to the earlier of the following:

1. Recovery or death.
2. Benefits paid equal 50% of total compensation during the period of SURS service.
3. If disablement occurs prior to age 65, the disability benefit may not continue past the August 31 following 70<sup>th</sup> birthday.
4. If disablement occurs at or after attainment of age 65, completion of five years in disablement.

Survivor and death benefits are payable if a member dies while receiving disability benefits.

If, at discontinuance of the disability benefit, the member is eligible for a retirement benefit



## Summary of Benefit Provisions of SURS

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(based on service, which includes the period of disability and may also include time receiving a disability retirement annuity), the member may retire and receive that benefit. The member may commence the retirement benefit once age and service requirements are met. The early retirement reduction does not apply for members who began first participating prior to January 1, 2011 (Tier 1). The benefit is based on the greatest of three formulas (General Formula, Money Purchase and Minimum Benefit), subject to applicable maximums. Contributions are not made during the disability period. However, accumulated contributions continue to accrue interest.

### Annual Increases

Each January 1 subsequent to retirement date, the monthly benefit being paid each retiree shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

## Disability Retirement Annuity

### Eligibility

Continuing disablement after discontinuation of the disability benefit as a result of reaching the "50% of total earnings" limitation. Disability is defined in accordance with the Social Security disability definition.

### Benefit

35% of the compensation being earned at disablement.

### Duration of Benefit

Benefits become payable upon discontinuance of the disability benefit and continue to the earlier of the following:

1. Recovery or death
2. Election to receive a retirement benefit

Survivor and death benefits are payable if a member dies while receiving a disability retirement annuity.

### Annual Increases

Each January 1 subsequent to retirement date, the monthly benefit being paid each retiree shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

For members hired on or after January 1, 2011, if the member converts to a service retirement annuity (item 2 above), each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased fifty percent of the Consumer Price Index ("CPI") up to a maximum of 3% of the originally granted benefit. The first increase will be granted upon the later



## Summary of Benefit Provisions of SURS

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of the attainment of age 67 or the first anniversary of the commencement of the annuity.

### Benefits for Deferred Members

#### Eligibility

For members hired before January 1, 2011, separation from employment with at least five years of service and separation from employment with at least 10 years of service for members hired on or after January 1, 2011.

#### Benefit

Benefit as defined for normal retirement purposes, but calculated based on final average compensation and service at date of termination.

#### Commencement of Benefit

Benefits commence when member reaches the age condition for either normal or early retirement.

#### Annual Increases

For members hired before January 1, 2011, who have not elected the AAI buyout, each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased by 3%. The adjustment for the first January after retirement shall be proportional. See page 84 for a description of the increase for members who have elected the AAI buyout.

For members hired on or after January 1, 2011, each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased fifty percent of the Consumer Price Index ("CPI") up to a maximum of 3% applied to the original benefit. The first increase will be granted upon the later of the attainment of age 67 or the first anniversary of the commencement of the annuity.

### Member Refunds

Non-vested terminated members and members who elect a refund in lieu of a vested benefit receive the following amounts.

#### Traditional Plan

Refund of the total accumulated member contribution at 4.5% interest.

#### Portable Plan

Refund of total accumulated member contributions at the full Effective Rate of Interest that is



## Summary of Benefit Provisions of SURS

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certified annually by the SURS Board, plus, if the member has the required years of service, a like amount of imputed employer contributions.

The required years of service is five years for all plans. (Must have 10 years if retirement age.)

### Accelerated Pension Benefit Options

Under Public Act (PA) 100-0587 and PA 101-0010, SURS shall offer an accelerated pension benefit payment to eligible members beginning on the implementation date and until June 30, 2024.

There are two accelerated pension benefit payment options that will be offered:

1. For vested inactive members, a payment equal to 60% of the present value of the member's pension benefit in lieu of receiving any pension benefit.
2. For members eligible for retirement, a payment equal to 70% of the difference between: (i) the present value of the automatic annual increases (AAI) to a Tier 1 member's retirement and survivor's annuity under the current AAI provisions and (ii) the present value of the automatic annual increases to the Tier 1 member's retirement annuity under revised AAI provisions:
  - a. The current AAI provisions are an annual 3% increase of the prior year's benefit (compound COLA) payable as of the January 1 following the annuity start date (first increase is prorated).
  - b. The revised AAI provisions are an annual 1.5% increase of the originally granted benefit (simple COLA). The delayed AAI begins the January 1 following the first anniversary of the retirement date, or the January 1 following age 67, whichever is later. The survivor AAI is first payable 1 year after the survivor annuity commences.

### Defined Contribution Plan

Public Act 100-0769, effective August 10, 2018, requires the SURS Board of Trustees, as soon as practicable after the effective date of the legislation, to establish and maintain a defined contribution plan. The defined contribution benefit must be an optional benefit to any member who chooses to participate. SURS has established the Deferred Compensation Plan (DCP).

Projected administrative expenses for this plan are included in the Statutory contribution. Other costs are not reflected in this valuation.



## **APPENDIX I**

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### **GLOSSARY OF TERMS**

## Glossary of Terms

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**Actuarial Accrued Liability (“AAL”).** 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.”

**Actuarial Assumptions.** Estimates of future plan experience such as investment return, expected lifetimes and the likelihood of receiving a pension from the Pension Plan. Demographic, or “people” assumptions, include rates of mortality, retirement and separation. Economic, or “money” assumptions, include expected investment return, inflation and salary increases.

**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 Present Value of Future Plan Benefits (“APV”).** 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.

**Actuarial Value of Assets (“AVA”).** Smoothed value of assets that recognizes the difference between the expected investment return using the valuation assumption of 8.0 percent and the actual investment return over a five-year period. Dampens volatility of asset value over time.

**Actuarially Determined Contribution (“ADC”).** The sum of the gross normal cost (including employee contributions) and amortization of the unfunded actuarial accrued liability over a period not to exceed 30 years.

**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.

**Annual Required Contribution (“ARC”).** The sum of the normal cost (net of employee contributions) and amortization of the unfunded actuarial accrued liability over a period not to exceed 30 years. Was required for accounting purposes by the Governmental Accounting Standards Board (GASB) Statement Nos. 25 and 27.

**Asset Return.** The net investment return for the asset divided by the mean asset value. Example: if \$1.00 is invested and yields \$1.065 after a year, the asset return is 6.50 percent.

**Funded Ratio.** The actuarial value of assets divided by the actuarial accrued liability. Measures the portion of the actuarial accrued liability that is currently funded.

**Market Value of Assets (“MVA”).** The value of assets currently held in the trust available to pay for benefits of the Pension Plan. Each of the investments in the trust is valued at market price which is the price at which buyers and sellers trade similar items in the open market.



## Glossary of Terms

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**Normal Cost (“NC”).** 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.

**Unfunded Actuarial Accrued Liability (“UAAL”).** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”

## **APPENDIX J**

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### **STRESS TESTING SCENARIOS**



November 17, 2021

Board of Trustees  
State Universities Retirement System of Illinois  
1901 Fox Drive  
Champaign, Illinois 61820

**Re: Stress Testing Scenarios based on Actuarial Valuation Results as of June 30, 2021**

Dear Members of the Board:

At your request, we have performed stress testing of the required statutory contributions and funded ratio for the State Universities Retirement System of Illinois ("SURS") based on the results of the June 30, 2021 actuarial valuation. Risk measures, as illustrated in this letter, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the statutory and actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions. We have illustrated the statutory contributions and funded ratios under the stress testing scenarios. However, we are not able to opine on the sponsor's ability to pay the contribution requirements.

GRS has prepared this analysis exclusively for the Trustees of the State Universities Retirement System; GRS is not responsible for reliance upon this report by any other party. This report may be provided to parties other than SURS only in its entirety and only with the permission of SURS and the Board.

**Description of Stress Testing Scenarios**

**Volatile Investment Return Scenarios**

GRS recommended and performed four alternative investment return stress testing scenarios. Graphs of the total statutory contributions under each of these four scenarios can be found in Exhibits I(A) and I(B), a summary of the total statutory contributions can be found in Exhibits III(A) and III(B) and additional details of the results of these scenarios can be found in Exhibits IV(A) through V(B). The alternative investment return stress testing scenarios are based on the System earning the following rates of investment return (on average) over the period from fiscal year 2022 through 2045:

1. Scenarios 1 – 2: Volatile returns in each year from 2022 through 2045, with a 24-year geometric average of 6.50 percent
  - 6.50 percent is the investment return assumption used in the actuarial valuation as of June 30, 2021

2. Scenario 3: Volatile returns in each year from 2022 through 2045, with a 24-year geometric average of 5.75 percent
  - 5.75 percent is approximately the 50<sup>th</sup> percentile return based on the SURS target asset allocation and capital market assumptions from 12 investment consultants as presented in our June 2021 SURS Experience Review
3. Scenario 4: Volatile returns in each year from 2022 through 2045, with a 24-year geometric average of 4.80 percent
  - 4.80 percent is approximately the 40<sup>th</sup> percentile return based on the SURS target asset allocation and capital market assumptions from 12 investment consultants as presented in our June 2021 SURS Experience Review

We have also included a baseline scenario (the basis for the June 30, 2021 actuarial valuation results) which assumes a static return of 6.50 percent each year from 2022 through 2045.

In order to demonstrate the risk and volatility of the returns, we provided results assuming volatile returns with a geometric average equal to the actuarial valuation assumption and approximately the 50<sup>th</sup> and 40<sup>th</sup> percentile returns (60 percent probability that the average return will be higher than the 40<sup>th</sup> percentile return and 50 percent probability that the average return will be higher than the 50<sup>th</sup> percentile return). Please note that each volatile return scenario represents one possible trial that generates the targeted average geometric return, and that another equally likely trial that produces the same targeted average geometric return could produce significantly different contribution and funded ratio patterns.

In each investment return scenario, the discount rate used to determine liabilities remains at 6.50 percent, average future uncapped salary growth or wage inflation remains at 3.00 percent per year and the future active population remains constant at 70,266 active members (the number of combined total full-time active members as of June 30, 2021, in the SURS defined benefit plan and the Retirement Savings Plan "RSP"). The assumed election percentages for future new hires are 25 percent to the RSP and 75 percent to Tier 2 for Non-Academic members and 45 percent to the RSP and 55 percent to Tier 2 for Academic members for all investment return scenarios, which is the same as the baseline from the actuarial valuation as of June 30, 2021.

#### Number of Active Members Scenario

In addition to the four investment return scenarios, GRS performed two sensitivity scenarios based on a decrease in the number of future full-time active members. A summary of the number of full-time active members used in these scenarios and the total statutory contributions under these scenarios can be found in Exhibit III(B) and additional details of the results of this scenario can be found in Exhibit VI(A) and Exhibit VI(B). The alternate full-time active population scenarios are based on the System earning the annual assumed rate of return of 6.50 percent in each future year and the following membership changes:

4. Scenario 5: one percent decrease in the number of full-time active members for 10 years (70,266 full-time active members in 2021 to 63,546 full-time active members in 2031)



- Scenario 6: five percent decrease in the number of full-time active members for one year (70,266 full-time active members in 2021 to 66,753 full-time active members in 2022)

Future New Hire Plan Election Scenarios

Furthermore, GRS performed sensitivity scenarios based on changes to the plan election assumption of future new hires. A summary of the total statutory contributions under these scenarios can be found in Exhibit III(B) and additional details of the results of these scenarios can be found in Exhibits VII(A) through VII(B). The alternate plan election scenarios are based on the System earning the annual assumed rate of return of 6.50 percent in each future year and the following future new hire plan election changes:

- Scenario 7: The assumed election percentages for future new hires are 15 percent lower than the valuation assumption (10 percent of Non-Academic members and 30 percent of Academic members elect RSP)
- Scenario 8: The assumed election percentages for future new hires are 15 percent higher than the valuation assumption (40 percent of Non-Academic members and 60 percent of Academic members elect RSP)

The following exhibits and graphs are included in this letter:

| Exhibit | Scenario | Average of Volatile Returns | % of Non-Academic /Academic New Hires to RSP | Ultimate Number of Full-Time Actives             | Scenario Description   |
|---------|----------|-----------------------------|--|--|--|
| I(A)    | 1-2      | 6.50%                       | 25%/45%                                      | 70,266   | Graphs of the Projected Total Statutory Contributions and Funded Ratio   |
| I(B)    | 3-4      | 5.75%, 4.80%                | 25%/45%                                      | 70,266   |  |
| I(C)    | 5-8      | 6.50% Static                | Varies by Scenario                           | 70,266<br>(63,546 Scenario 5, 66,753 Scenario 6) | Graphs of the Projected Total Statutory Contributions and Funded Ratio under the Number of Active Member Sensitivity and Future New Hire Plan Election Scenarios |
| II      | 1-4      | 5.75%, 4.80%, 6.50%         | 25%/45%                                      | 70,266   | Graph of the Projected Annual Rates of Return used in the Volatile Investment Return Stress Testing Scenarios  |
| III(A)  | 1-8      | 5.75%, 4.80%, 6.50%         | Varies by Scenario                           | 70,266<br>(63,546 Scenario 5, 66,753 Scenario 6) | Comparison of Total Contributions, Unfunded Liability and Funded Ratio   |
| III(B)  | 1-8      | 5.75%, 4.80%, 6.50%         | Varies by Scenario                           | 70,266<br>(63,546 Scenario 5, 66,753 Scenario 6) | Comparison of Number of Full Time Active Members Used in the Stress Testing Scenarios and Total Statutory Contributions  |
| IV(A)   | 1        | 6.50%                       | 25%/45%                                      | 70,266   | Comparison of Actuarial Valuation Results and Volatile Investment Return Stress Testing Scenario   |
| IV(B)   | 2        | 6.50%                       | 25%/45%                                      | 70,266   |  |
| V(A)    | 3        | 5.75%                       | 25%/45%                                      | 70,266   |  |
| V(B)    | 4        | 4.80%                       | 25%/45%                                      | 70,266   |  |
| VI(A)   | 5        | 6.50% Static                | 25%/45%                                      | 63,546   | Comparison of Actuarial Valuation Results and Number of Active Member Sensitivity Scenario   |
| VI(B)   | 6        | 6.50% Static                | 25%/45%                                      | 66,753   |  |
| VII(A)  | 7        | 6.50% Static                | 10%/30%                                      | 70,266   | Comparison of Actuarial Valuation Results and Future New Hire Plan Election Scenario   |
| VII(B)  | 8        | 6.50% Static                | 40%/60%                                      | 70,266   |  |
| VIII    | 1-4      | 5.75%, 4.80%, 6.50%         | 25%/45%                                      | 70,266   | Comparison of Assumed Investment Returns Used in the Stress Testing Scenarios  |



GRS believes that these scenarios provide a plausible illustration of the potential future volatility of investment returns and a changing workforce and the resulting statutory contribution requirements based on the current assumptions and methods (including the current plan election assumptions). These scenarios are not intended to represent the full range of all possible outcomes. Annual returns will likely be significantly different from the returns shown in Exhibit VIII and the 24-year geometric average of actual returns may be either higher or lower than the assumption of 6.50 percent. The statutory contributions shown in this analysis are the combined amounts from both the State and the employers. Under the provisions of PA 100-0023, employers make contributions beginning in fiscal year 2018 for current members in excess of the Governor’s pay, and under PA 101-0010, and employers make contributions equal to the present value of the increase in benefit attributable to member pay increases in excess of 6.00 percent during the final average salary (FAS) period.

### **Analysis of Stress Testing Scenario Results**

Under the projected results from the actuarial valuation as of June 30, 2021 in which all future actuarial assumptions are assumed to be realized, the statutory contribution gradually increases by a steady rate (once the deferred asset gains and losses are fully recognized in the actuarial value of assets and the phase-in of assumption changes). There is also an increase in the funded ratio from 43.9 percent on an actuarial value of assets basis as of June 30, 2021 to 90 percent as of June 30, 2045 with a significant portion of the increase occurring in the last five years of the projection period. The funded ratio increases from about 71.1 percent to 90 percent between 2040 and 2045.

The following table presents a summary of the combined State and employer (“statutory”) contributions (including RSP) and the present value of the total statutory contributions during the fiscal years 2022 through 2045 under the alternative stress testing scenarios. The total statutory contributions do not include excess benefit arrangement (EBA) contributions. In addition, we have summarized the unfunded actuarial accrued liability (UAAL) based on the market value of assets as of June 30, 2045, and the present value of the market value UAAL for each scenario. The contributions and UAAL are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.

|  | Contributions* FY 2022-2045<br>(\$ in Millions) |                     |                             | MVA UAAL at 2045<br>(\$ in Millions) |             | Total PV<br>Contributions<br>+ UAAL |
|--|---|---------------------|-----------------------------|--------------------------------------|-------------|-------------------------------------|
|  | Total<br>Contributions                          | PV<br>Contributions | MVA Funded<br>Ratio in 2045 | UAAL                                 | PV of UAAL  |                                     |
| Baseline (6.50% Static)                              | \$62,722.766                                    | \$30,371.266        | 90.00%                      | \$5,153.627                          | \$1,136.900 | \$31,508.166                        |
| Scenario 1 (6.50% Volatile)                          | 58,673.624                                      | 30,727.855          | 80.77%                      | 9,910.048                            | 2,186.176   | 32,914.031                          |
| Scenario 2 (6.50% Volatile)                          | 60,697.915                                      | 29,433.038          | 87.38%                      | 6,503.781                            | 1,434.747   | 30,867.785                          |
| Scenario 3 (5.75% Volatile)                          | 72,295.028                                      | 33,585.790          | 92.68%                      | 3,771.873                            | 832.083     | 34,417.873                          |
| Scenario 4 (4.80% Volatile)                          | 74,245.186                                      | 33,763.314          | 78.70%                      | 10,979.243                           | 2,422.043   | 36,185.357                          |
| Scenario 5 (Decrease Actives 1% per year for 10 yrs) | 61,842.635                                      | 30,210.026          | 90.00%                      | 5,055.289                            | 1,115.207   | 31,325.233                          |
| Scenario 6 (Decrease Actives 5% in first year)       | 62,378.184                                      | 30,252.285          | 90.00%                      | 5,084.297                            | 1,121.606   | 31,373.891                          |
| Scenario 7 (-15% Of New Hires Elect RSP)             | 61,607.097                                      | 30,013.892          | 90.00%                      | 5,321.912                            | 1,174.024   | 31,187.916                          |
| Scenario 8 (+15% Of New Hires Elect RSP)             | 63,833.545                                      | 30,728.640          | 90.00%                      | 4,985.343                            | 1,099.777   | 31,828.417                          |

\*Combined State and employer contributions. Includes total RSP contributions. Excludes EBA contributions.



Because of the volatility and deviation of the returns from the actuarial assumption of 6.50 percent and the fact that the statutory contribution for fiscal year 2045 is determined based on the actuarial valuation results as of June 30, 2043, the funded ratios on both an actuarial value of assets basis and a market value of assets basis do not equal 90 percent in 2045. In Scenario 3 the market value funded ratio is greater than 90 percent in 2045 and in several of the scenarios the market value funded ratio is less than 90 percent. In order to better compare the future obligation between the scenarios and recognize that the unfunded liability and funded ratio as of June 30, 2045 are different under each scenario, we have included the sum of the present value of contributions between 2022 and 2045 and the present value of the market value UAAL as of June 30, 2045.

Based on the scenarios that are summarized above, the total statutory contributions and the present value of the statutory contributions and the unfunded actuarial liability (UAL) are highly dependent on both the annualized investment returns and the pattern of the investment returns. In the scenarios in which the average geometric return is 6.50 percent over the years 2022 through 2045 (Baseline and Scenarios 1-2), the amount of total statutory contributions varies up to \$4.0 billion between the scenarios and the sum of the present value of contributions and the present value of the market value UAAL at 2045 varies up to \$2.0 billion between the scenarios. In the scenarios in which the average geometric return is 5.75 percent and 4.80 percent over the years 2022 through 2045 (Scenarios 3-4), the amount of total statutory contributions varies up to \$2.0 billion between the scenarios and the sum of the present value of contributions and the present value of the market value UAAL at 2045 varies up to \$1.8 billion between the two scenarios. Although the average geometric return is 6.50 percent under Scenario 1 and 5.75 percent under Scenario 3, the sum of the present value of contributions and the present value of the market value UAAL at 2045 varies only by \$1.5 billion between the scenarios due to the patterns of the investment returns.

In each scenario, we have assumed that the State and the employers will make the statutory contribution when due. However, some scenarios result in very high contributions rates for extended periods of time and may jeopardize the sustainability of the System. We are not able to opine on the sponsor's ability to pay such high contribution requirements.

Due to the volatility of the investment returns, the minimum market value funded ratio during the projection period is less than 38 percent in Scenarios 1 and 4. The stress testing does not take into account the implication of potential required changes in asset allocation in order to maintain sufficient liquidity to make all required benefit payments.

To the best of our knowledge, this actuarial statement is complete and accurate, fairly presents the actuarial position of SURS as of June 30, 2021 under the alternative stress testing scenarios, and has been prepared in accordance with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Future actuarial measurements may differ significantly from the current measurements 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, contribution amounts or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

This letter is part of the SURS actuarial valuation as of June 30, 2021 and is subject to the same actuarial assumptions and disclosures as used in the presentation and the actuarial valuation report. The stress testing scenarios used future investment returns as shown in Exhibit VIII. All other assumptions and methods were the same as those used in the SURS actuarial valuation as of June 30, 2021 including the 6.50 percent discount rate used to determine liabilities in all stress testing scenarios and the assumed election percentages for future new hires of 25 percent of Non-Academic and 45 percent of Academic members elect the RSP and 75 percent of Non-Academic and 55 percent of Academic members elect Tier 2 for scenarios 1 through 6. The future new hire election scenarios use a static return assumption of 6.50 percent per year and vary the percentage of new hires assumed to elect the RSP and defined benefit plans.

In each projection scenario, the Statutory contribution in each year has been projected as though an actuarial valuation in each of those years was performed. The market value of assets at each projected valuation is assumed to be based on the rates of investment return and Statutory contributions in the preceding years, according to the Scenario being modeled, and the valuation interest rate going forward. At each projected actuarial valuation, an additional 20 percent of the investment gains and losses are recognized in the actuarial value of assets. The actuarial value of assets is projected to earn the actuarial valuation rate of 6.50 percent from the valuation date to 2045. This iterative process is followed for each projection year through 2045.

This analysis was prepared using our proprietary valuation model and related software and spreadsheet models used to calculate the statutory contributions in each future year through 2045 under the SURS statutory funding policy. In our professional judgment, the models used have the capability to provide results that are consistent with the purposes of the valuation and have no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled. We are relying on the GRS actuaries and Internal Software, Training, and Processes Team who developed and maintain the model.

Numerous additional assumptions could be varied in stress testing scenarios, such as payroll growth, inflation and other member behavior. The stress testing analysis performed focused on variations in investment return, a changing workforce and new hire plan elections, which are likely three of the most significant stressors on the System. GRS can perform additional stress testing scenarios at the Board's request.

The statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution. Meeting the statutory requirement does not mean that the



undersigned agree that adequate actuarial funding has been achieved; we recommend the development and adherence to a funding policy that funds the normal cost of the plan as well as an amortization payment that would seek to pay off the total unfunded accrued liability over a closed period of no less than 15 years and no more than the period of time in order to attain 100 percent funding by the year 2045 (23 years remaining in the actuarial valuation as of June 30, 2021, which calculated the fiscal year 2023 contribution).

This report reflects the impact of COVID-19 through June 30, 2021. However, this report does not reflect the longer term and still developing future impact of COVID-19, which is likely to further influence demographic experience and economic expectations. We will continue to monitor these developments and their impact on the System and the actuarial assumptions. Actual experience will be reflected in each subsequent annual valuation, as experience emerges.

The signing actuaries are independent of the plan sponsor.

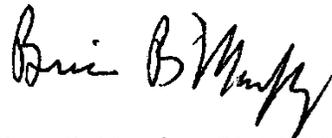
Amy Williams and Brian B. Murphy are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein.

Sincerely,

Gabriel, Roeder, Smith & Company



Amy Williams, ASA, FCA, MAAA  
Senior Consultant



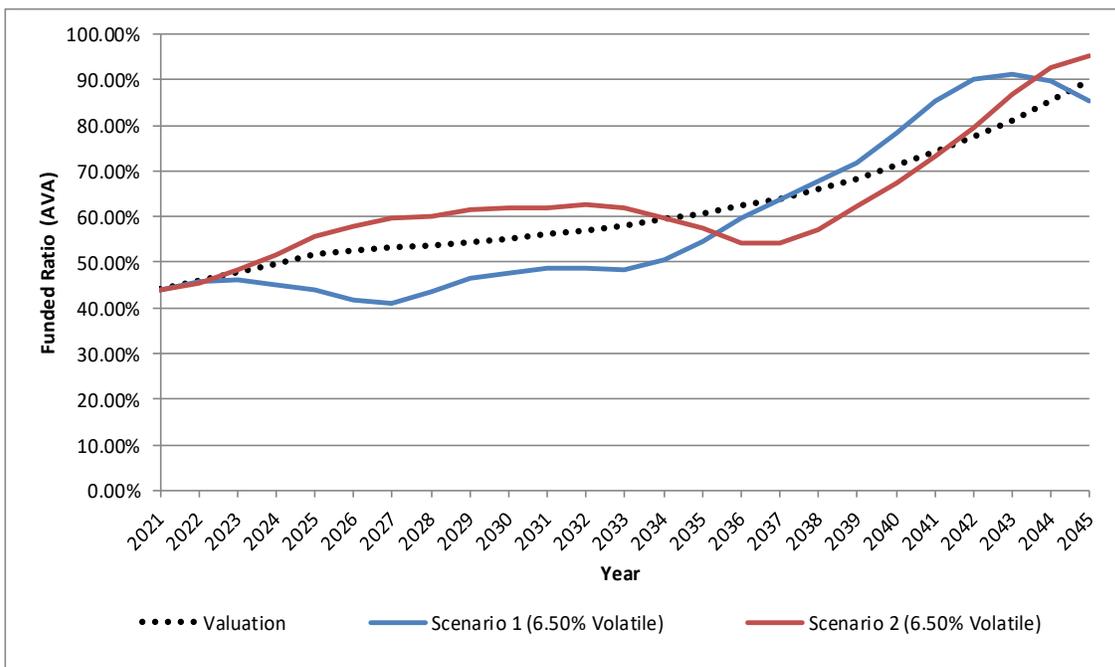
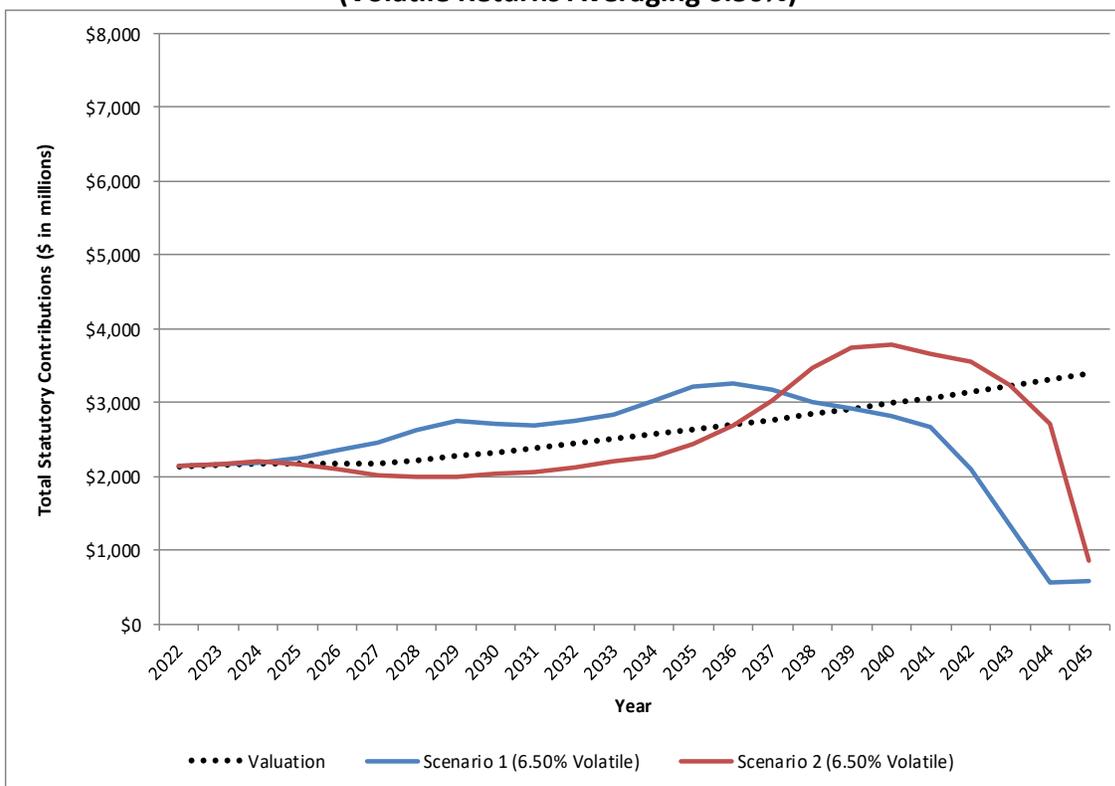
Brian B. Murphy, FSA, EA, MAAA, FCA, PhD  
Senior Consultant

AW/BBM:rl

cc: Kristen Brundirks, Gabriel, Roeder, Smith & Company  
Kevin Noelke, Gabriel, Roeder, Smith & Company

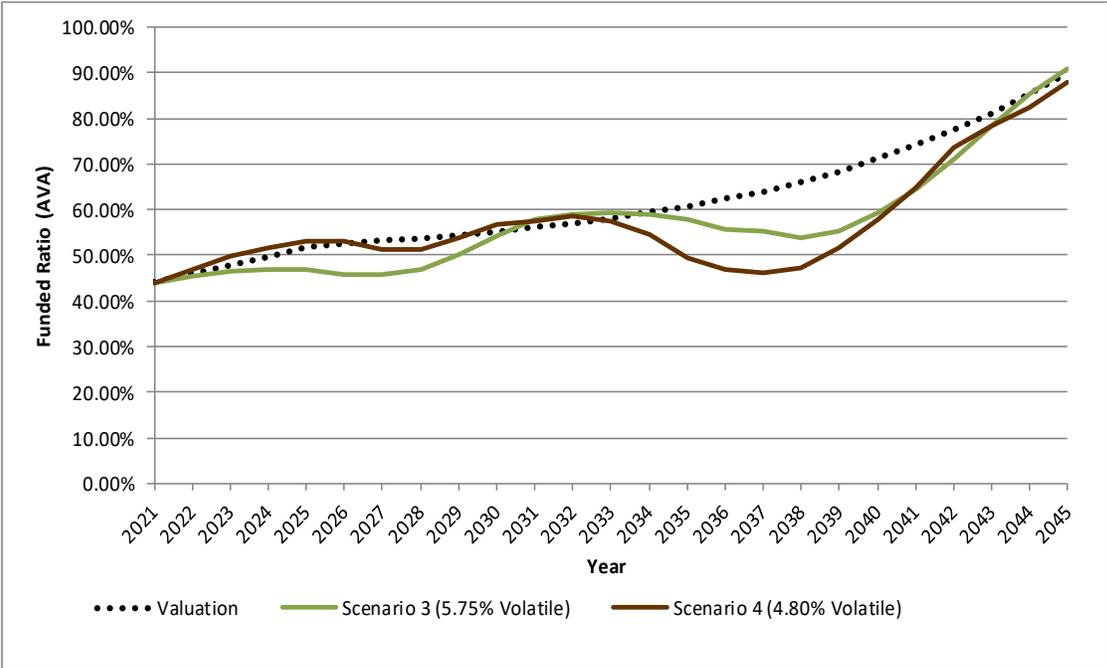
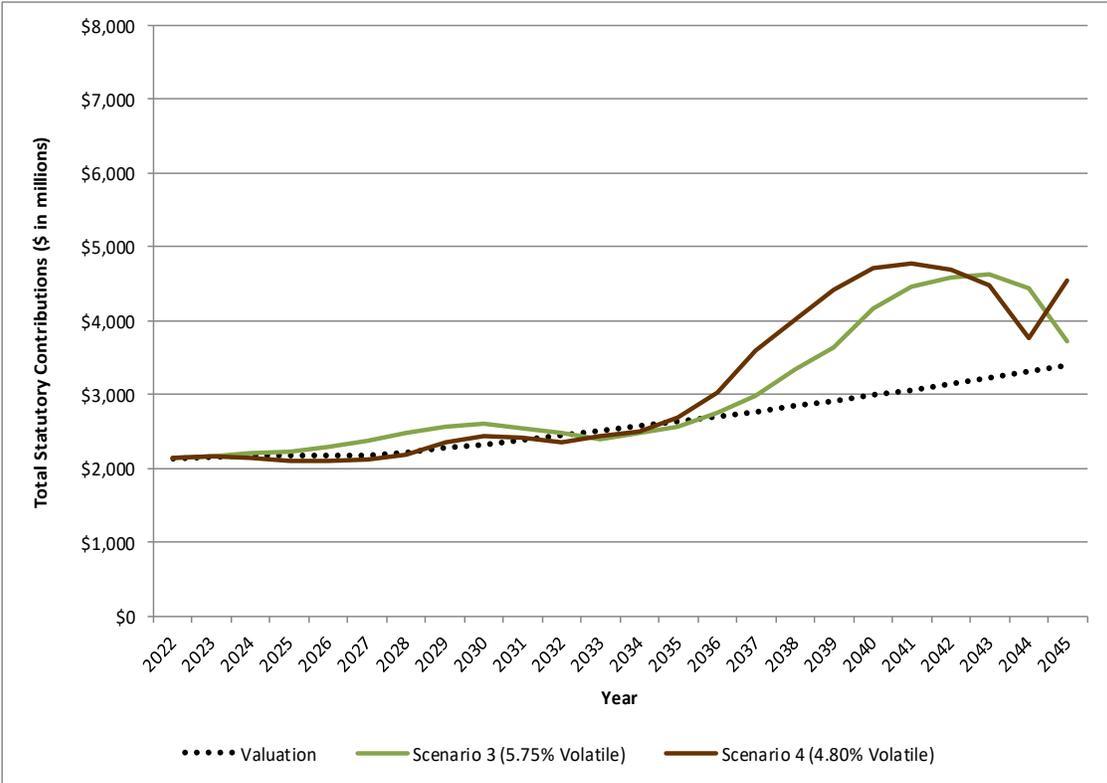


**State Universities Retirement System  
Comparison of Total Statutory Contributions and Funded Ratio  
Assuming an Annual Return of 6.50% (Valuation Assumption) and  
Rates under the Volatile Investment Return Stress Testing Scenarios  
(Volatile Returns Averaging 6.50%)**



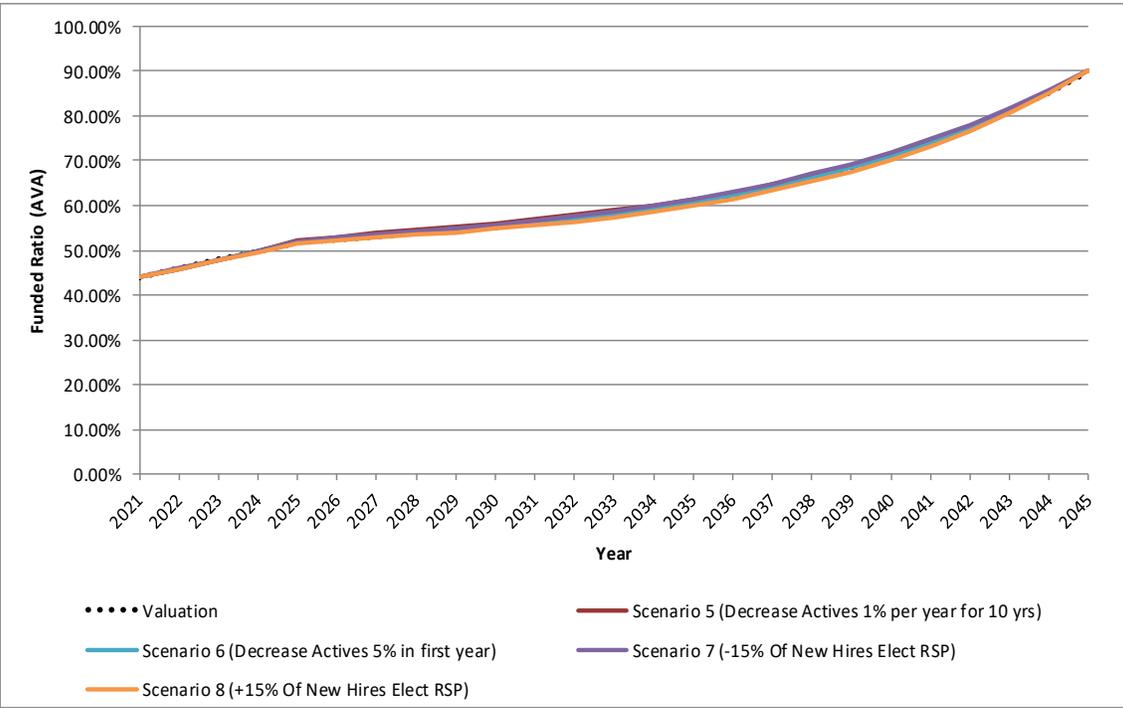
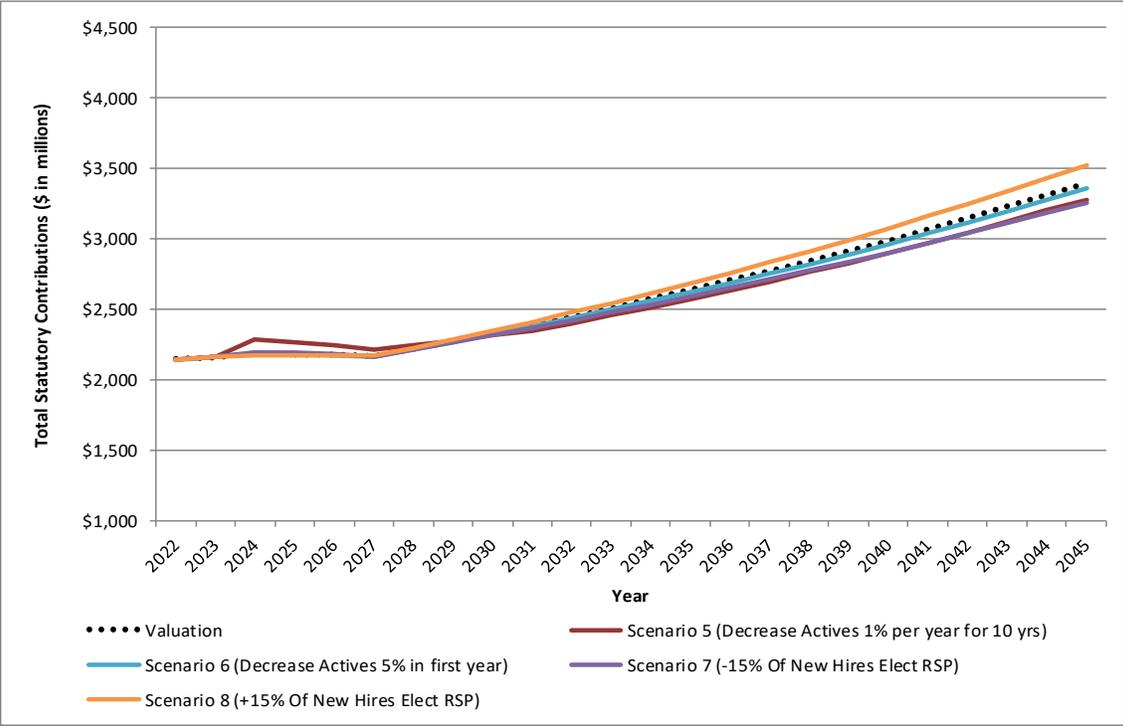
Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

**State Universities Retirement System**  
**Comparison of Total Statutory Contributions and Funded Ratio**  
**Assuming an Annual Return of 6.50% (Valuation Assumption) and**  
**Rates under the Volatile Investment Return Stress Testing Scenarios**  
**(Volatile Returns Averaging 5.75% and 4.80%)**



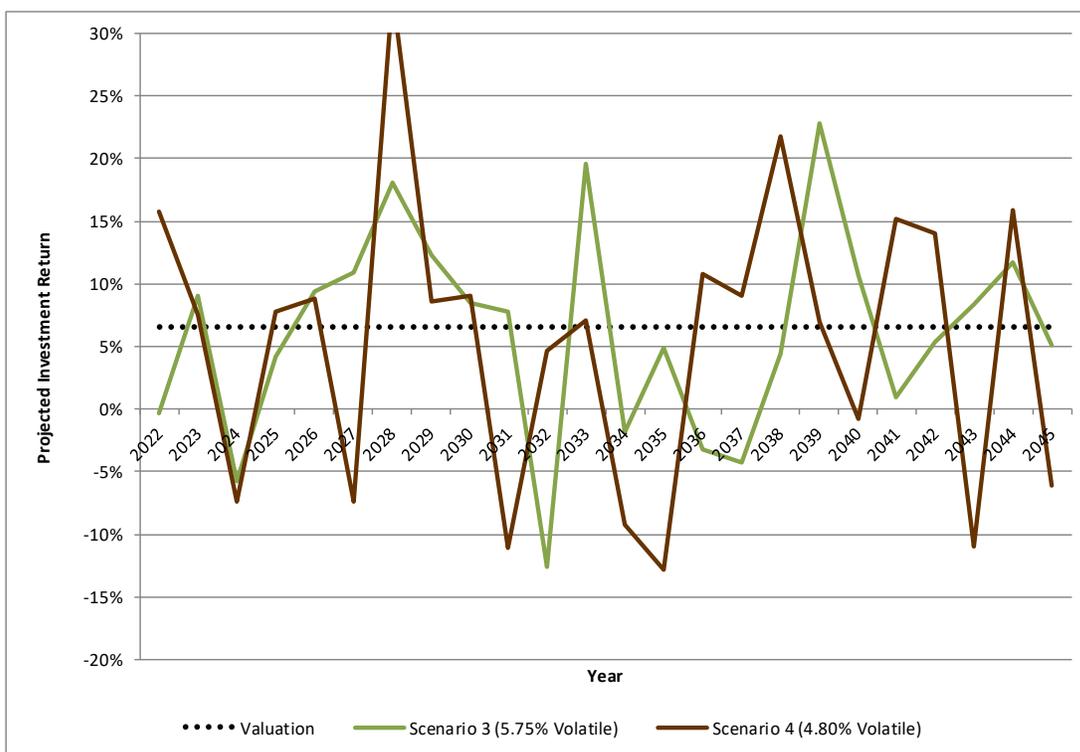
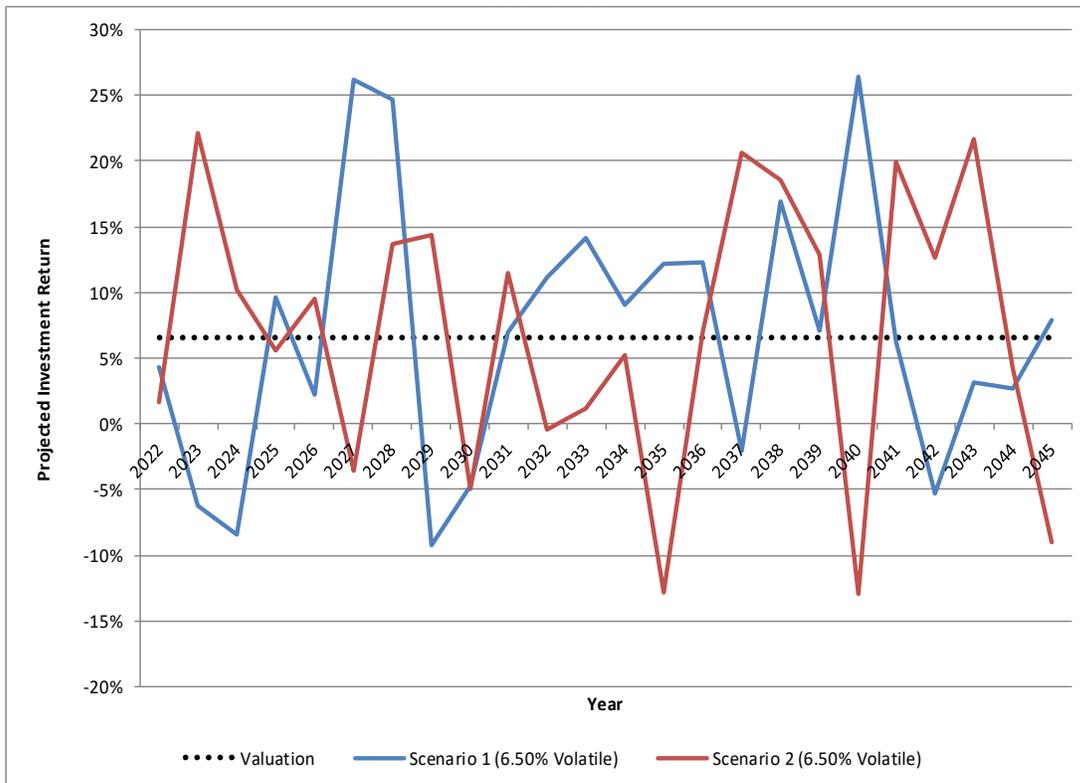
Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

**State Universities Retirement System  
 Comparison of Total Statutory Contributions and Funded Ratio  
 Assuming an Annual Return of 6.50% (Valuation Assumption) and  
 Rates under the Number of Active Members Sensitivity and Future New Hire Election Scenarios**



Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

### State Universities Retirement System Comparison of Projected Rates of Investment Return Assuming an Annual Return of 6.50% (Valuation Assumption) and Rates under the Stress Testing Scenarios



**State Universities Retirement System**  
**Comparison of Total Contributions, Unfunded Liability and Funded Ratio**  
**Based on Actuarial Valuation as of June 30, 2021**

|  | Contributions* FY 2022-2045<br>(\$ in Millions) |               |               | MVA UAAL at 2045<br>(\$ in Millions) |             | Total PV                |
|--|---|---------------|---------------|--------------------------------------|-------------|-------------------------|
|  | Total   | PV            | MVA Funded    | UAAL                                 | PV of UAAL  | Contributions<br>+ UAAL |
|  | Contributions                                   | Contributions | Ratio in 2045 |                                      |             |                         |
| Baseline (6.50% Static)                              | \$62,722.766                                    | \$30,371.266  | 90.00%        | \$5,153.627                          | \$1,136.900 | \$31,508.166            |
| Scenario 1 (6.50% Volatile)                          | 58,673.624                                      | 30,727.855    | 80.77%        | 9,910.048                            | 2,186.176   | 32,914.031              |
| Scenario 2 (6.50% Volatile)                          | 60,697.915                                      | 29,433.038    | 87.38%        | 6,503.781                            | 1,434.747   | 30,867.785              |
| Scenario 3 (5.75% Volatile)                          | 72,295.028                                      | 33,585.790    | 92.68%        | 3,771.873                            | 832.083     | 34,417.873              |
| Scenario 4 (4.80% Volatile)                          | 74,245.186                                      | 33,763.314    | 78.70%        | 10,979.243                           | 2,422.043   | 36,185.357              |
| Scenario 5 (Decrease Actives 1% per year for 10 yrs) | 61,842.635                                      | 30,210.026    | 90.00%        | 5,055.289                            | 1,115.207   | 31,325.233              |
| Scenario 6 (Decrease Actives 5% in first year)       | 62,378.184                                      | 30,252.285    | 90.00%        | 5,084.297                            | 1,121.606   | 31,373.891              |
| Scenario 7 (-15% Of New Hires Elect RSP)             | 61,607.097                                      | 30,013.892    | 90.00%        | 5,321.912                            | 1,174.024   | 31,187.916              |
| Scenario 8 (+15% Of New Hires Elect RSP)             | 63,833.545                                      | 30,728.640    | 90.00%        | 4,985.343                            | 1,099.777   | 31,828.417              |

|  | Annual Statutory<br>Contribution \$ Change |                     | Minimum Funded Ratio |        | Annual Funded Ratio<br>(AVA) Change |                     |
|--|--|---------------------|----------------------|--------|-------------------------------------|---------------------|
|  | Maximum<br>Increase                        | Maximum<br>Decrease | (AVA)                | (MVA)  | Maximum<br>Increase                 | Maximum<br>Decrease |
|  | Baseline (6.50% Static)                    |                     |                      | 45.94% | 49.44%                              |                     |
| Scenario 1 (6.50% Volatile)                          | 7.03%                                      | -57.38%             | 40.97%               | 37.47% | 6.77%                               | -4.50%              |
| Scenario 2 (6.50% Volatile)                          | 14.79%                                     | -68.14%             | 45.48%               | 46.43% | 7.26%                               | -3.08%              |
| Scenario 3 (5.75% Volatile)                          | 14.38%                                     | -15.79%             | 45.30%               | 42.46% | 7.50%                               | -1.92%              |
| Scenario 4 (4.80% Volatile)                          | 20.47%                                     | -15.68%             | 46.00%               | 37.59% | 8.53%                               | -5.02%              |
| Scenario 5 (Decrease Actives 1% per year for 10 yrs) | 5.78%                                      | -1.44%              | 45.94%               | 49.44% | 4.62%                               | 0.72%               |
| Scenario 6 (Decrease Actives 5% in first year)       | 3.77%                                      | -0.62%              | 45.94%               | 49.43% | 4.71%                               | 0.60%               |
| Scenario 7 (-15% Of New Hires Elect RSP)             | 3.77%                                      | -0.74%              | 45.96%               | 49.46% | 4.40%                               | 0.66%               |
| Scenario 8 (+15% Of New Hires Elect RSP)             | 3.77%                                      | -0.28%              | 45.93%               | 49.43% | 4.96%                               | 0.54%               |

\*Combined State and employer contributions. Includes total RSP contributions. Excludes EBA contributions.

The contributions and unfunded actuarial accrued liability (UAAL) are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.

**State Universities Retirement System**  
**Comparison of Number of Full Time Active Members Used in the Stress Testing Scenarios and Total Statutory Contributions**  
**Based on Actuarial Valuation as of June 30, 2021**

| Year | Full-Time Active<br>Count (DB and RSP) |            |            | Total Statutory Contributions (\$ in Millions) |              |              |              |              |              |              |              |              |              |
|------|--|------------|------------|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|      | Baseline                               | Scenario 5 | Scenario 6 | Baseline                                       | Scenario 1   | Scenario 2   | Scenario 3   | Scenario 4   | Scenario 5   | Scenario 6   | Scenario 7   | Scenario 8   |              |
| 2021 | 70,266                                 | 70,266     | 70,266     |  |              |              |              |              |              |              |              |              |              |
| 2022 | 70,266                                 | 69,563     | 66,753     | \$2,142.017                                    | \$2,142.017  | \$2,142.017  | \$2,142.017  | \$2,142.017  | \$2,142.017  | \$2,142.017  | \$2,142.017  | \$2,142.017  |              |
| 2023 | 70,266                                 | 68,867     | 66,753     | 2,160.874                                      | 2,160.874    | 2,160.874    | 2,160.874    | 2,160.874    | 2,160.874    | 2,160.874    | 2,160.874    | 2,160.874    |              |
| 2024 | 70,266                                 | 68,178     | 66,753     | 2,182.600                                      | 2,190.648    | 2,200.829    | 2,208.281    | 2,148.956    | 2,285.757    | 2,188.861    | 2,194.992    | 2,170.773    |              |
| 2025 | 70,266                                 | 67,496     | 66,753     | 2,179.480                                      | 2,246.313    | 2,163.715    | 2,228.218    | 2,099.540    | 2,263.789    | 2,182.082    | 2,187.241    | 2,172.219    |              |
| 2026 | 70,266                                 | 66,821     | 66,753     | 2,176.897                                      | 2,356.044    | 2,096.032    | 2,292.896    | 2,110.334    | 2,241.390    | 2,176.631    | 2,179.811    | 2,174.470    |              |
| 2027 | 70,266                                 | 66,153     | 66,753     | 2,165.869                                      | 2,462.758    | 2,019.952    | 2,365.564    | 2,126.184    | 2,209.096    | 2,163.107    | 2,163.708    | 2,168.409    |              |
| 2028 | 70,266                                 | 65,491     | 66,753     | 2,218.973                                      | 2,635.919    | 1,993.240    | 2,487.700    | 2,194.698    | 2,242.906    | 2,214.024    | 2,212.073    | 2,226.214    |              |
| 2029 | 70,266                                 | 64,836     | 66,753     | 2,273.781                                      | 2,749.266    | 1,997.657    | 2,569.514    | 2,364.685    | 2,277.250    | 2,266.740    | 2,261.903    | 2,285.955    |              |
| 2030 | 70,266                                 | 64,188     | 66,753     | 2,329.999                                      | 2,721.752    | 2,048.939    | 2,607.100    | 2,444.106    | 2,311.826    | 2,321.002    | 2,312.901    | 2,347.342    |              |
| 2031 | 70,266                                 | 63,546     | 66,753     | 2,387.089                                      | 2,694.955    | 2,060.865    | 2,553.833    | 2,411.436    | 2,346.032    | 2,376.226    | 2,364.507    | 2,409.858    |              |
| 2032 | 70,266                                 | 63,546     | 66,753     | 2,446.175                                      | 2,762.316    | 2,130.565    | 2,477.737    | 2,364.494    | 2,397.564    | 2,433.577    | 2,417.879    | 2,474.595    |              |
| 2033 | 70,266                                 | 63,546     | 66,753     | 2,508.347                                      | 2,838.908    | 2,215.690    | 2,406.232    | 2,443.757    | 2,453.414    | 2,493.995    | 2,474.065    | 2,542.683    |              |
| 2034 | 70,266                                 | 63,546     | 66,753     | 2,572.285                                      | 3,035.288    | 2,272.584    | 2,473.036    | 2,494.806    | 2,511.796    | 2,556.365    | 2,531.737    | 2,612.810    |              |
| 2035 | 70,266                                 | 63,546     | 66,753     | 2,637.580                                      | 3,221.166    | 2,438.195    | 2,570.392    | 2,698.069    | 2,571.877    | 2,619.981    | 2,590.412    | 2,684.640    |              |
| 2036 | 70,266                                 | 63,546     | 66,753     | 2,703.782                                      | 3,262.153    | 2,697.594    | 2,750.266    | 3,037.769    | 2,633.030    | 2,684.518    | 2,649.597    | 2,757.765    |              |
| 2037 | 70,266                                 | 63,546     | 66,753     | 2,771.748                                      | 3,170.084    | 3,024.159    | 2,991.138    | 3,587.718    | 2,696.091    | 2,750.859    | 2,710.117    | 2,833.071    |              |
| 2038 | 70,266                                 | 63,546     | 66,753     | 2,841.471                                      | 2,997.554    | 3,471.496    | 3,349.693    | 4,011.004    | 2,761.036    | 2,819.000    | 2,771.967    | 2,910.553    |              |
| 2039 | 70,266                                 | 63,546     | 66,753     | 2,913.116                                      | 2,928.540    | 3,747.439    | 3,648.356    | 4,419.028    | 2,828.033    | 2,889.120    | 2,835.325    | 2,990.362    |              |
| 2040 | 70,266                                 | 63,546     | 66,753     | 2,987.035                                      | 2,821.923    | 3,793.001    | 4,173.118    | 4,721.270    | 2,897.424    | 2,961.587    | 2,900.518    | 3,072.873    |              |
| 2041 | 70,266                                 | 63,546     | 66,753     | 3,063.875                                      | 2,664.486    | 3,660.411    | 4,452.096    | 4,785.446    | 2,969.894    | 3,037.093    | 2,968.240    | 3,158.685    |              |
| 2042 | 70,266                                 | 63,546     | 66,753     | 3,142.533                                      | 2,105.121    | 3,544.857    | 4,588.666    | 4,696.777    | 3,044.253    | 3,114.526    | 3,037.366    | 3,246.722    |              |
| 2043 | 70,266                                 | 63,546     | 66,753     | 3,223.156                                      | 1,346.984    | 3,229.273    | 4,631.104    | 4,471.069    | 3,120.669    | 3,193.913    | 3,108.007    | 3,337.161    |              |
| 2044 | 70,266                                 | 63,546     | 66,753     | 3,305.205                                      | 574.117      | 2,721.420    | 4,433.652    | 3,769.792    | 3,198.529    | 3,274.765    | 3,179.578    | 3,429.509    |              |
| 2045 | 70,266                                 | 63,546     | 66,753     | 3,388.879                                      | 584.438      | 867.111      | 3,733.545    | 4,541.357    | 3,278.088    | 3,357.321    | 3,252.262    | 3,523.985    |              |
|      |  |            |            | <b>Total Contributions FY 2022-2045</b>        | \$62,722.766 | \$58,673.624 | \$60,697.915 | \$72,295.028 | \$74,245.186 | \$61,842.635 | \$62,378.184 | \$61,607.097 | \$63,833.545 |
|      |  |            |            | <b>Total Present Value FY 2022-2045</b>        | \$30,371.266 | \$30,727.855 | \$29,433.038 | \$33,585.790 | \$33,763.314 | \$30,210.026 | \$30,252.285 | \$30,013.892 | \$30,728.640 |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



### State Universities Retirement System Comparison of Actuarial Valuation Results and Stress Testing Scenario 1 (Volatile Returns Averaging 6.50%) Based on Actuarial Valuation as of June 30, 2021

| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              |                                  |   | Stress Test Scenario 1    |  |  |   |  |                              |  |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|--|
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |  |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |  |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | 4.31%                            | 4.31%                                   | 2,054.958                 | 2,142.017                                  | 45.74%                                       | 48.41%                                    | 3.77%                                    | 1.80%                        |  |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | -6.25%                           | -1.11%                                  | 2,070.405                 | 2,160.874                                  | 46.17%                                       | 43.22%                                    | 0.88%                                    | 0.43%                        |  |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | -8.39%                           | -3.60%                                  | 2,095.492                 | 2,190.648                                  | 45.03%                                       | 37.47%                                    | 1.38%                                    | -1.14%                       |  |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 9.57%                            | -0.46%                                  | 2,146.301                 | 2,246.313                                  | 44.07%                                       | 38.74%                                    | 2.54%                                    | -0.96%                       |  |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 2.24%                            | 0.07%                                   | 2,251.228                 | 2,356.044                                  | 41.68%                                       | 37.47%                                    | 4.88%                                    | -2.39%                       |  |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | 26.15%                           | 4.01%                                   | 2,353.118                 | 2,462.758                                  | 40.97%                                       | 44.96%                                    | 4.53%                                    | -0.71%                       |  |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 24.72%                           | 6.74%                                   | 2,521.415                 | 2,635.919                                  | 43.72%                                       | 53.96%                                    | 7.03%                                    | 2.75%                        |  |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | -9.24%                           | 4.60%                                   | 2,629.811                 | 2,749.266                                  | 46.65%                                       | 47.27%                                    | 4.30%                                    | 2.94%                        |  |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | -4.78%                           | 3.51%                                   | 2,597.285                 | 2,721.752                                  | 47.73%                                       | 43.15%                                    | -1.00%                                   | 1.07%                        |  |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | 6.92%                            | 3.85%                                   | 2,565.365                 | 2,694.955                                  | 48.73%                                       | 44.03%                                    | -0.98%                                   | 1.00%                        |  |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | 11.17%                           | 4.49%                                   | 2,627.403                 | 2,762.316                                  | 48.84%                                       | 46.83%                                    | 2.50%                                    | 0.11%                        |  |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 14.15%                           | 5.27%                                   | 2,698.445                 | 2,838.908                                  | 48.33%                                       | 51.38%                                    | 2.77%                                    | -0.50%                       |  |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | 9.05%                            | 5.55%                                   | 2,889.105                 | 3,035.288                                  | 50.34%                                       | 54.32%                                    | 6.92%                                    | 2.01%                        |  |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | 12.13%                           | 6.01%                                   | 3,069.100                 | 3,221.166                                  | 54.49%                                       | 59.50%                                    | 6.12%                                    | 4.15%                        |  |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | 12.29%                           | 6.42%                                   | 3,104.110                 | 3,262.153                                  | 59.68%                                       | 65.46%                                    | 1.27%                                    | 5.19%                        |  |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | -2.04%                           | 5.87%                                   | 3,005.842                 | 3,170.084                                  | 63.62%                                       | 62.72%                                    | -2.82%                                   | 3.94%                        |  |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 16.91%                           | 6.49%                                   | 2,826.950                 | 2,997.554                                  | 67.62%                                       | 71.44%                                    | -5.44%                                   | 4.00%                        |  |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 7.13%                            | 6.52%                                   | 2,751.468                 | 2,928.540                                  | 71.90%                                       | 74.61%                                    | -2.30%                                   | 4.28%                        |  |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | 26.35%                           | 7.48%                                   | 2,638.165                 | 2,821.923                                  | 78.53%                                       | 92.01%                                    | -3.64%                                   | 6.62%                        |  |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 6.22%                            | 7.42%                                   | 2,473.909                 | 2,664.486                                  | 85.29%                                       | 95.43%                                    | -5.58%                                   | 6.77%                        |  |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | -5.37%                           | 6.77%                                   | 1,907.642                 | 2,105.121                                  | 90.15%                                       | 87.09%                                    | -20.99%                                  | 4.86%                        |  |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | 3.17%                            | 6.61%                                   | 1,142.495                 | 1,346.984                                  | 91.11%                                       | 84.98%                                    | -36.01%                                  | 0.96%                        |  |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 2.73%                            | 6.44%                                   | 362.488                   | 574.117                                    | 89.67%                                       | 80.92%                                    | -57.38%                                  | -1.43%                       |  |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | 7.92%                            | 6.50%                                   | 365.512                   | 584.438                                    | 85.17%                                       | 80.77%                                    | 1.80%                                    | -4.50%                       |  |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$55,148.012              | \$58,673.624                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$29,113.402              | \$30,727.855                               |  |   |  |                              |  |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |  |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$4,049.143              | -\$4,049.142                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | \$356.588                 | \$356.589                                  |  |   |  |                              |  |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 7.03%                                    | 6.77%                        |  |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -57.38%                                  | -4.50%                       |  |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



**State Universities Retirement System  
Comparison of Actuarial Valuation Results and Stress Testing Scenario 2 (Volatile Returns Averaging 6.50%)  
Based on Actuarial Valuation as of June 30, 2021**

\$ in Millions

| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              |                                  | Stress Test Scenario 2                  |                           |  |  |   |  |                              |  |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|--|
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |  |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |  |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | 1.58%                            | 1.58%                                   | 2,054.958                 | 2,142.017                                  | 45.48%                                       | 47.12%                                    | 3.77%                                    | 1.54%                        |  |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | 22.12%                           | 11.38%                                  | 2,070.405                 | 2,160.874                                  | 48.21%                                       | 54.98%                                    | 0.88%                                    | 2.73%                        |  |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | 10.14%                           | 10.96%                                  | 2,105.673                 | 2,200.829                                  | 51.79%                                       | 58.02%                                    | 1.85%                                    | 3.58%                        |  |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 5.51%                            | 9.57%                                   | 2,063.703                 | 2,163.715                                  | 55.49%                                       | 58.53%                                    | -1.69%                                   | 3.70%                        |  |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 9.56%                            | 9.57%                                   | 1,991.216                 | 2,096.032                                  | 57.95%                                       | 61.14%                                    | -3.13%                                   | 2.46%                        |  |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | -3.60%                           | 7.26%                                   | 1,910.312                 | 2,019.952                                  | 59.54%                                       | 55.94%                                    | -3.63%                                   | 1.60%                        |  |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 13.70%                           | 8.15%                                   | 1,878.736                 | 1,993.240                                  | 60.08%                                       | 60.22%                                    | -1.32%                                   | 0.54%                        |  |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | 14.40%                           | 8.92%                                   | 1,878.202                 | 1,997.657                                  | 61.39%                                       | 65.39%                                    | 0.22%                                    | 1.30%                        |  |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | -4.93%                           | 7.28%                                   | 1,924.472                 | 2,048.939                                  | 61.70%                                       | 59.01%                                    | 2.57%                                    | 0.31%                        |  |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | 11.49%                           | 7.70%                                   | 1,931.275                 | 2,060.865                                  | 61.78%                                       | 62.33%                                    | 0.58%                                    | 0.09%                        |  |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | -0.46%                           | 6.93%                                   | 1,995.652                 | 2,130.565                                  | 62.49%                                       | 58.84%                                    | 3.38%                                    | 0.70%                        |  |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 1.19%                            | 6.44%                                   | 2,075.227                 | 2,215.690                                  | 61.70%                                       | 56.43%                                    | 4.00%                                    | -0.79%                       |  |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | 5.22%                            | 6.34%                                   | 2,126.401                 | 2,272.584                                  | 59.76%                                       | 56.26%                                    | 2.57%                                    | -1.94%                       |  |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | -12.83%                          | 4.84%                                   | 2,286.129                 | 2,438.195                                  | 57.41%                                       | 46.43%                                    | 7.29%                                    | -2.36%                       |  |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | 6.99%                            | 4.99%                                   | 2,539.551                 | 2,697.594                                  | 54.32%                                       | 47.22%                                    | 10.64%                                   | -3.08%                       |  |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | 20.56%                           | 5.90%                                   | 2,859.917                 | 3,024.159                                  | 54.09%                                       | 55.04%                                    | 12.11%                                   | -0.24%                       |  |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 18.56%                           | 6.60%                                   | 3,300.892                 | 3,471.496                                  | 57.12%                                       | 64.28%                                    | 14.79%                                   | 3.04%                        |  |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 12.83%                           | 6.94%                                   | 3,570.367                 | 3,747.439                                  | 62.25%                                       | 72.16%                                    | 7.95%                                    | 5.13%                        |  |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | -12.96%                          | 5.79%                                   | 3,609.243                 | 3,793.001                                  | 67.37%                                       | 62.57%                                    | 1.22%                                    | 5.12%                        |  |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 19.87%                           | 6.45%                                   | 3,469.834                 | 3,660.411                                  | 73.27%                                       | 74.46%                                    | -3.50%                                   | 5.90%                        |  |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | 12.68%                           | 6.74%                                   | 3,347.378                 | 3,544.857                                  | 79.36%                                       | 83.22%                                    | -3.16%                                   | 6.09%                        |  |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | 21.69%                           | 7.38%                                   | 3,024.784                 | 3,229.273                                  | 86.62%                                       | 99.99%                                    | -8.90%                                   | 7.26%                        |  |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 4.17%                            | 7.24%                                   | 2,509.791                 | 2,721.420                                  | 92.74%                                       | 102.05%                                   | -15.73%                                  | 6.12%                        |  |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | -9.06%                           | 6.50%                                   | 648.185                   | 867.111                                    | 95.13%                                       | 87.38%                                    | -68.14%                                  | 2.39%                        |  |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$57,172.303              | \$60,697.915                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$27,818.586              | \$29,433.038                               |  |   |  |                              |  |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |  |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$2,024.852              | -\$2,024.851                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$938.228                | -\$938.228                                 |  |   |  |                              |  |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 14.79%                                   | 7.26%                        |  |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -68.14%                                  | -3.08%                       |  |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



**State Universities Retirement System  
Comparison of Actuarial Valuation Results and Stress Testing Scenario 3 (Volatile Returns Averaging 5.75%)  
Based on Actuarial Valuation as of June 30, 2021**

\$ in Millions

| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              |                                  | Stress Test Scenario 3                  |                           |  |  |   |  |                              |  |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|--|
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |  |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |  |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | -0.39%                           | -0.39%                                  | 2,054.958                 | 2,142.017                                  | 45.30%                                       | 46.20%                                    | 3.77%                                    | 1.36%                        |  |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | 8.99%                            | 4.19%                                   | 2,070.405                 | 2,160.874                                  | 46.58%                                       | 47.99%                                    | 0.88%                                    | 1.28%                        |  |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | -5.81%                           | 0.75%                                   | 2,113.125                 | 2,208.281                                  | 46.84%                                       | 43.01%                                    | 2.19%                                    | 0.26%                        |  |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 4.17%                            | 1.59%                                   | 2,128.206                 | 2,228.218                                  | 46.82%                                       | 42.46%                                    | 0.90%                                    | -0.02%                       |  |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 9.34%                            | 3.10%                                   | 2,188.080                 | 2,292.896                                  | 45.69%                                       | 44.03%                                    | 2.90%                                    | -1.12%                       |  |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | 10.90%                           | 4.36%                                   | 2,255.924                 | 2,365.564                                  | 45.72%                                       | 46.43%                                    | 3.17%                                    | 0.03%                        |  |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 18.06%                           | 6.21%                                   | 2,373.196                 | 2,487.700                                  | 46.88%                                       | 52.45%                                    | 5.16%                                    | 1.15%                        |  |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | 12.26%                           | 6.95%                                   | 2,450.059                 | 2,569.514                                  | 50.15%                                       | 56.60%                                    | 3.29%                                    | 3.28%                        |  |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | 8.47%                            | 7.12%                                   | 2,482.633                 | 2,607.100                                  | 54.05%                                       | 59.13%                                    | 1.46%                                    | 3.90%                        |  |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | 7.72%                            | 7.18%                                   | 2,424.243                 | 2,553.833                                  | 57.82%                                       | 61.24%                                    | -2.04%                                   | 3.77%                        |  |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | -12.55%                          | 5.21%                                   | 2,342.824                 | 2,477.737                                  | 58.85%                                       | 51.17%                                    | -2.98%                                   | 1.03%                        |  |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 19.62%                           | 6.35%                                   | 2,265.769                 | 2,406.232                                  | 59.32%                                       | 58.21%                                    | -2.89%                                   | 0.46%                        |  |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | -1.86%                           | 5.69%                                   | 2,326.853                 | 2,473.036                                  | 58.78%                                       | 54.48%                                    | 2.78%                                    | -0.54%                       |  |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | 4.86%                            | 5.63%                                   | 2,418.326                 | 2,570.392                                  | 57.75%                                       | 54.52%                                    | 3.94%                                    | -1.03%                       |  |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | -3.23%                           | 5.02%                                   | 2,592.223                 | 2,750.266                                  | 55.83%                                       | 50.54%                                    | 7.00%                                    | -1.92%                       |  |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | -4.26%                           | 4.41%                                   | 2,826.896                 | 2,991.138                                  | 55.36%                                       | 46.64%                                    | 8.76%                                    | -0.47%                       |  |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 4.45%                            | 4.41%                                   | 3,179.089                 | 3,349.693                                  | 53.77%                                       | 47.52%                                    | 11.99%                                   | -1.58%                       |  |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 22.77%                           | 5.36%                                   | 3,471.284                 | 3,648.356                                  | 55.29%                                       | 57.68%                                    | 8.92%                                    | 1.52%                        |  |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | 10.62%                           | 5.63%                                   | 3,989.360                 | 4,173.118                                  | 59.15%                                       | 64.24%                                    | 14.38%                                   | 3.86%                        |  |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 0.97%                            | 5.39%                                   | 4,261.519                 | 4,452.096                                  | 64.36%                                       | 65.85%                                    | 6.69%                                    | 5.21%                        |  |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | 5.29%                            | 5.38%                                   | 4,391.187                 | 4,588.666                                  | 70.93%                                       | 70.65%                                    | 3.07%                                    | 6.57%                        |  |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | 8.33%                            | 5.52%                                   | 4,426.615                 | 4,631.104                                  | 78.43%                                       | 78.02%                                    | 0.92%                                    | 7.50%                        |  |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 11.72%                           | 5.78%                                   | 4,222.023                 | 4,433.652                                  | 85.34%                                       | 88.36%                                    | -4.26%                                   | 6.91%                        |  |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | 5.08%                            | 5.75%                                   | 3,514.619                 | 3,733.545                                  | 90.84%                                       | 92.68%                                    | -15.79%                                  | 5.50%                        |  |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$68,769.416              | \$72,295.028                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$31,971.338              | \$33,585.790                               |  |   |  |                              |  |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |  |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | \$9,572.261               | \$9,572.262                                |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | \$3,214.524               | \$3,214.524                                |  |   |  |                              |  |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 14.38%                                   | 7.50%                        |  |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -15.79%                                  | -1.92%                       |  |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



**State Universities Retirement System  
Comparison of Actuarial Valuation Results and Stress Testing Scenario 4 (Volatile Returns Averaging 4.80%)  
Based on Actuarial Valuation as of June 30, 2021**

\$ in Millions

| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              |                                  | Stress Test Scenario 4                  |                           |  |  |   |  |                              |  |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|--|
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |  |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |  |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | 15.77%                           | 15.77%                                  | 2,054.958                 | 2,142.017                                  | 46.82%                                       | 53.81%                                    | 3.77%                                    | 2.88%                        |  |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | 7.58%                            | 11.60%                                  | 2,070.405                 | 2,160.874                                  | 49.95%                                       | 55.43%                                    | 0.88%                                    | 3.14%                        |  |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | -7.43%                           | 4.86%                                   | 2,053.800                 | 2,148.956                                  | 51.55%                                       | 48.94%                                    | -0.55%                                   | 1.59%                        |  |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 7.77%                            | 5.58%                                   | 1,999.528                 | 2,099.540                                  | 52.91%                                       | 50.01%                                    | -2.30%                                   | 1.36%                        |  |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 8.77%                            | 6.21%                                   | 2,005.518                 | 2,110.334                                  | 53.14%                                       | 51.55%                                    | 0.51%                                    | 0.23%                        |  |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | -7.40%                           | 3.81%                                   | 2,016.544                 | 2,126.184                                  | 51.20%                                       | 45.08%                                    | 0.75%                                    | -1.94%                       |  |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 33.18%                           | 7.57%                                   | 2,080.194                 | 2,194.698                                  | 51.14%                                       | 56.88%                                    | 3.22%                                    | -0.06%                       |  |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | 8.53%                            | 7.69%                                   | 2,245.230                 | 2,364.685                                  | 53.74%                                       | 59.07%                                    | 7.75%                                    | 2.60%                        |  |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | 9.05%                            | 7.84%                                   | 2,319.639                 | 2,444.106                                  | 56.71%                                       | 61.81%                                    | 3.36%                                    | 2.97%                        |  |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | -11.06%                          | 5.78%                                   | 2,281.846                 | 2,411.436                                  | 57.37%                                       | 52.51%                                    | -1.34%                                   | 0.65%                        |  |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | 4.64%                            | 5.68%                                   | 2,229.581                 | 2,364.494                                  | 58.43%                                       | 52.13%                                    | -1.95%                                   | 1.06%                        |  |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 7.04%                            | 5.79%                                   | 2,303.294                 | 2,443.757                                  | 57.32%                                       | 53.03%                                    | 3.35%                                    | -1.11%                       |  |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | -9.22%                           | 4.55%                                   | 2,348.623                 | 2,494.806                                  | 54.47%                                       | 45.63%                                    | 2.09%                                    | -2.85%                       |  |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | -12.85%                          | 3.20%                                   | 2,546.003                 | 2,698.069                                  | 49.45%                                       | 37.59%                                    | 8.15%                                    | -5.02%                       |  |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | 10.78%                           | 3.69%                                   | 2,879.726                 | 3,037.769                                  | 46.92%                                       | 39.78%                                    | 12.59%                                   | -2.53%                       |  |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | 9.07%                            | 4.02%                                   | 3,423.476                 | 3,587.718                                  | 46.00%                                       | 42.66%                                    | 18.10%                                   | -0.92%                       |  |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 21.74%                           | 4.99%                                   | 3,840.400                 | 4,011.004                                  | 47.29%                                       | 52.01%                                    | 11.80%                                   | 1.29%                        |  |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 6.96%                            | 5.09%                                   | 4,241.956                 | 4,419.028                                  | 51.66%                                       | 56.51%                                    | 10.17%                                   | 4.37%                        |  |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | -0.85%                           | 4.77%                                   | 4,537.512                 | 4,721.270                                  | 57.84%                                       | 57.45%                                    | 6.84%                                    | 6.18%                        |  |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 15.19%                           | 5.27%                                   | 4,594.869                 | 4,785.446                                  | 64.96%                                       | 67.90%                                    | 1.36%                                    | 7.12%                        |  |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | 14.01%                           | 5.67%                                   | 4,499.298                 | 4,696.777                                  | 73.49%                                       | 79.03%                                    | -1.85%                                   | 8.53%                        |  |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | -11.04%                          | 4.85%                                   | 4,266.580                 | 4,471.069                                  | 78.25%                                       | 71.37%                                    | -4.81%                                   | 4.77%                        |  |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 15.87%                           | 5.30%                                   | 3,558.163                 | 3,769.792                                  | 82.46%                                       | 82.49%                                    | -15.68%                                  | 4.20%                        |  |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | -6.18%                           | 4.80%                                   | 4,322.431                 | 4,541.357                                  | 87.73%                                       | 78.70%                                    | 20.47%                                   | 5.27%                        |  |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$70,719.574              | \$74,245.186                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$32,148.862              | \$33,763.314                               |  |   |  |                              |  |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |  |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | \$11,522.419              | \$11,522.420                               |  |   |  |                              |  |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | \$3,392.048               | \$3,392.048                                |  |   |  |                              |  |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 20.47%                                   | 8.53%                        |  |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -15.68%                                  | -5.02%                       |  |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



### State Universities Retirement System

#### Comparison of Actuarial Valuation Results and Stress Testing Scenario 5 (Decreasing Full-Time Active Members – 1%/year for 10 Years) Based on Actuarial Valuation as of June 30, 2021

| \$ in Millions                          |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|
| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              | Stress Test Scenario 5           |   |                           |  |  |   |  |                              |
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | 6.50%                            | 6.50%                                   | 2,055.799                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.00%                        |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | 6.50%                            | 6.50%                                   | 2,072.198                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | 6.50%                            | 6.50%                                   | 2,193.243                 | 2,285.757                                  | 49.94%                                       | 51.30%                                    | 5.78%                                    | 2.11%                        |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 6.50%                            | 6.50%                                   | 2,167.489                 | 2,263.789                                  | 52.22%                                       | 52.22%                                    | -0.96%                                   | 2.27%                        |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 6.50%                            | 6.50%                                   | 2,141.437                 | 2,241.390                                  | 53.04%                                       | 53.04%                                    | -0.99%                                   | 0.83%                        |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | 6.50%                            | 6.50%                                   | 2,105.548                 | 2,209.096                                  | 53.76%                                       | 53.76%                                    | -1.44%                                   | 0.72%                        |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 6.50%                            | 6.50%                                   | 2,135.806                 | 2,242.906                                  | 54.49%                                       | 54.49%                                    | 1.53%                                    | 0.74%                        |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | 6.50%                            | 6.50%                                   | 2,166.593                 | 2,277.250                                  | 55.26%                                       | 55.26%                                    | 1.53%                                    | 0.77%                        |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | 6.50%                            | 6.50%                                   | 2,197.635                 | 2,311.826                                  | 56.06%                                       | 56.06%                                    | 1.52%                                    | 0.80%                        |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | 6.50%                            | 6.50%                                   | 2,228.280                 | 2,346.032                                  | 56.90%                                       | 56.90%                                    | 1.48%                                    | 0.84%                        |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | 6.50%                            | 6.50%                                   | 2,275.194                 | 2,397.564                                  | 57.83%                                       | 57.83%                                    | 2.20%                                    | 0.93%                        |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 6.50%                            | 6.50%                                   | 2,326.166                 | 2,453.414                                  | 58.87%                                       | 58.87%                                    | 2.33%                                    | 1.04%                        |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | 6.50%                            | 6.50%                                   | 2,379.464                 | 2,511.796                                  | 60.04%                                       | 60.04%                                    | 2.38%                                    | 1.17%                        |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | 6.50%                            | 6.50%                                   | 2,434.289                 | 2,571.877                                  | 61.37%                                       | 61.37%                                    | 2.39%                                    | 1.33%                        |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | 6.50%                            | 6.50%                                   | 2,490.093                 | 2,633.030                                  | 62.87%                                       | 62.87%                                    | 2.38%                                    | 1.50%                        |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | 6.50%                            | 6.50%                                   | 2,547.588                 | 2,696.091                                  | 64.63%                                       | 64.63%                                    | 2.39%                                    | 1.76%                        |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 6.50%                            | 6.50%                                   | 2,606.812                 | 2,761.036                                  | 66.62%                                       | 66.62%                                    | 2.41%                                    | 1.99%                        |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 6.50%                            | 6.50%                                   | 2,667.989                 | 2,828.033                                  | 68.87%                                       | 68.87%                                    | 2.43%                                    | 2.25%                        |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | 6.50%                            | 6.50%                                   | 2,731.352                 | 2,897.424                                  | 71.43%                                       | 71.43%                                    | 2.45%                                    | 2.55%                        |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 6.50%                            | 6.50%                                   | 2,797.673                 | 2,969.894                                  | 74.31%                                       | 74.31%                                    | 2.50%                                    | 2.89%                        |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | 6.50%                            | 6.50%                                   | 2,865.812                 | 3,044.253                                  | 77.58%                                       | 77.58%                                    | 2.50%                                    | 3.26%                        |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | 6.50%                            | 6.50%                                   | 2,935.911                 | 3,120.669                                  | 81.26%                                       | 81.26%                                    | 2.51%                                    | 3.68%                        |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 6.50%                            | 6.50%                                   | 3,007.337                 | 3,198.529                                  | 85.38%                                       | 85.38%                                    | 2.49%                                    | 4.13%                        |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | 6.50%                            | 6.50%                                   | 3,080.319                 | 3,278.088                                  | 90.00%                                       | 90.00%                                    | 2.49%                                    | 4.62%                        |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$58,610.027              | \$61,842.635                               |  |   |  |                              |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$28,713.964              | \$30,210.026                               |  |   |  |                              |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$587.128                | -\$880.131                                 |  |   |  |                              |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$42.850                 | -\$161.240                                 |  |   |  |                              |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 5.78%                                    | 4.62%                        |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -1.44%                                   | 0.72%                        |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



### State Universities Retirement System Comparison of Actuarial Valuation Results and Stress Testing Scenario 6 (Decreasing Full-Time Active Members – 5%/year for 1 Year) Based on Actuarial Valuation as of June 30, 2021

| \$ in Millions                          |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|
| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              | Stress Test Scenario 6           |   |                           |  |  |   |  |                              |
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | 6.50%                            | 6.50%                                   | 2,059.160                 | 2,142.017                                  | 45.94%                                       | 49.43%                                    | 3.77%                                    | 2.00%                        |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | 6.50%                            | 6.50%                                   | 2,075.077                 | 2,160.874                                  | 47.83%                                       | 50.27%                                    | 0.88%                                    | 1.90%                        |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | 6.50%                            | 6.50%                                   | 2,098.459                 | 2,188.861                                  | 49.75%                                       | 51.10%                                    | 1.30%                                    | 1.91%                        |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 6.50%                            | 6.50%                                   | 2,087.156                 | 2,182.082                                  | 51.85%                                       | 51.85%                                    | -0.31%                                   | 2.10%                        |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 6.50%                            | 6.50%                                   | 2,077.204                 | 2,176.631                                  | 52.54%                                       | 52.54%                                    | -0.25%                                   | 0.68%                        |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | 6.50%                            | 6.50%                                   | 2,059.140                 | 2,163.107                                  | 53.14%                                       | 53.14%                                    | -0.62%                                   | 0.60%                        |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 6.50%                            | 6.50%                                   | 2,105.475                 | 2,214.024                                  | 53.79%                                       | 53.79%                                    | 2.35%                                    | 0.65%                        |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | 6.50%                            | 6.50%                                   | 2,153.524                 | 2,266.740                                  | 54.50%                                       | 54.50%                                    | 2.38%                                    | 0.71%                        |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | 6.50%                            | 6.50%                                   | 2,203.056                 | 2,321.002                                  | 55.27%                                       | 55.27%                                    | 2.39%                                    | 0.77%                        |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | 6.50%                            | 6.50%                                   | 2,253.436                 | 2,376.226                                  | 56.12%                                       | 56.12%                                    | 2.38%                                    | 0.85%                        |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | 6.50%                            | 6.50%                                   | 2,305.744                 | 2,433.577                                  | 57.06%                                       | 57.06%                                    | 2.41%                                    | 0.94%                        |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 6.50%                            | 6.50%                                   | 2,360.904                 | 2,493.995                                  | 58.12%                                       | 58.12%                                    | 2.48%                                    | 1.06%                        |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | 6.50%                            | 6.50%                                   | 2,417.840                 | 2,556.365                                  | 59.32%                                       | 59.32%                                    | 2.50%                                    | 1.20%                        |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | 6.50%                            | 6.50%                                   | 2,475.872                 | 2,619.981                                  | 60.68%                                       | 60.68%                                    | 2.49%                                    | 1.36%                        |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | 6.50%                            | 6.50%                                   | 2,534.737                 | 2,684.518                                  | 62.22%                                       | 62.22%                                    | 2.46%                                    | 1.54%                        |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | 6.50%                            | 6.50%                                   | 2,595.190                 | 2,750.859                                  | 64.02%                                       | 64.02%                                    | 2.47%                                    | 1.80%                        |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 6.50%                            | 6.50%                                   | 2,657.284                 | 2,819.000                                  | 66.06%                                       | 66.06%                                    | 2.48%                                    | 2.04%                        |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 6.50%                            | 6.50%                                   | 2,721.259                 | 2,889.120                                  | 68.37%                                       | 68.37%                                    | 2.49%                                    | 2.31%                        |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | 6.50%                            | 6.50%                                   | 2,787.369                 | 2,961.587                                  | 70.99%                                       | 70.99%                                    | 2.51%                                    | 2.62%                        |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 6.50%                            | 6.50%                                   | 2,856.388                 | 3,037.093                                  | 73.96%                                       | 73.96%                                    | 2.55%                                    | 2.96%                        |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | 6.50%                            | 6.50%                                   | 2,927.253                 | 3,114.526                                  | 77.30%                                       | 77.30%                                    | 2.55%                                    | 3.35%                        |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | 6.50%                            | 6.50%                                   | 2,999.973                 | 3,193.913                                  | 81.07%                                       | 81.07%                                    | 2.55%                                    | 3.76%                        |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 6.50%                            | 6.50%                                   | 3,074.033                 | 3,274.765                                  | 85.29%                                       | 85.29%                                    | 2.53%                                    | 4.22%                        |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | 6.50%                            | 6.50%                                   | 3,149.645                 | 3,357.321                                  | 90.00%                                       | 90.00%                                    | 2.52%                                    | 4.71%                        |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$59,035.178              | \$62,378.184                               |  |   |  |                              |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$28,721.234              | \$30,252.285                               |  |   |  |                              |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$161.977                | -\$344.582                                 |  |   |  |                              |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$35.580                 | -\$118.981                                 |  |   |  |                              |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 3.77%                                    | 4.71%                        |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -0.62%                                   | 0.60%                        |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



**State Universities Retirement System  
Comparison of Actuarial Valuation Results and Sensitivity Scenario 7 (Decrease Percentage of Future New Hires Who Elect RSP by 15%)  
Based on Actuarial Valuation as of June 30, 2021**

\$ in Millions

| June 30, 2021 Valuation Baseline        |                             |                           |  |  |   |  |                              | Stress Test Scenario 7           |   |                           |  |  |   |  |                              |
|---|-----------------------------|---------------------------|--|--|---|--|------------------------------|----------------------------------|---|---------------------------|--|--|---|--|------------------------------|
| Year Ending                             | Projected Investment Return | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio | Annual Rate of Investment Return | Cumulative Geometric Return (from 2022) | DB Statutory Contribution | Total Statutory Contribution Including RSP | Actuarial Value of Assets (AVA) Funded Ratio | Market Value of Assets (MVA) Funded Ratio | Increase in Total Statutory Contribution | Increase in AVA Funded Ratio |
| 2021                                    |                             | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              | 23.75%                           |   | \$1,978.743               | \$2,064.105                                | 43.94%                                       | 48.61%                                    |  |                              |
| 2022                                    | 6.50%                       | 2,054.958                 | 2,142.017                                  | 45.94%                                       | 49.44%                                    | 3.77%                                    | 2.01%                        | 6.50%                            | 6.50%                                   | 2,059.039                 | 2,142.017                                  | 45.96%                                       | 49.46%                                    | 3.77%                                    | 2.02%                        |
| 2023                                    | 6.50%                       | 2,070.405                 | 2,160.874                                  | 47.84%                                       | 50.28%                                    | 0.88%                                    | 1.90%                        | 6.50%                            | 6.50%                                   | 2,078.544                 | 2,160.874                                  | 47.89%                                       | 50.32%                                    | 0.88%                                    | 1.93%                        |
| 2024                                    | 6.50%                       | 2,087.445                 | 2,182.600                                  | 49.74%                                       | 51.09%                                    | 1.01%                                    | 1.90%                        | 6.50%                            | 6.50%                                   | 2,111.096                 | 2,194.992                                  | 49.85%                                       | 51.20%                                    | 1.58%                                    | 1.96%                        |
| 2025                                    | 6.50%                       | 2,079.468                 | 2,179.480                                  | 51.83%                                       | 51.83%                                    | -0.14%                                   | 2.09%                        | 6.50%                            | 6.50%                                   | 2,102.061                 | 2,187.241                                  | 52.00%                                       | 52.00%                                    | -0.35%                                   | 2.16%                        |
| 2026                                    | 6.50%                       | 2,072.081                 | 2,176.897                                  | 52.51%                                       | 52.51%                                    | -0.12%                                   | 0.68%                        | 6.50%                            | 6.50%                                   | 2,093.288                 | 2,179.811                                  | 52.74%                                       | 52.74%                                    | -0.34%                                   | 0.74%                        |
| 2027                                    | 6.50%                       | 2,056.228                 | 2,165.869                                  | 53.11%                                       | 53.11%                                    | -0.51%                                   | 0.60%                        | 6.50%                            | 6.50%                                   | 2,075.759                 | 2,163.708                                  | 53.41%                                       | 53.41%                                    | -0.74%                                   | 0.66%                        |
| 2028                                    | 6.50%                       | 2,104.469                 | 2,218.973                                  | 53.76%                                       | 53.76%                                    | 2.45%                                    | 0.65%                        | 6.50%                            | 6.50%                                   | 2,122.638                 | 2,212.073                                  | 54.12%                                       | 54.12%                                    | 2.24%                                    | 0.71%                        |
| 2029                                    | 6.50%                       | 2,154.325                 | 2,273.781                                  | 54.46%                                       | 54.46%                                    | 2.47%                                    | 0.71%                        | 6.50%                            | 6.50%                                   | 2,170.920                 | 2,261.903                                  | 54.89%                                       | 54.89%                                    | 2.25%                                    | 0.77%                        |
| 2030                                    | 6.50%                       | 2,205.532                 | 2,329.999                                  | 55.24%                                       | 55.24%                                    | 2.47%                                    | 0.77%                        | 6.50%                            | 6.50%                                   | 2,220.324                 | 2,312.901                                  | 55.72%                                       | 55.72%                                    | 2.25%                                    | 0.84%                        |
| 2031                                    | 6.50%                       | 2,257.499                 | 2,387.089                                  | 56.09%                                       | 56.09%                                    | 2.45%                                    | 0.85%                        | 6.50%                            | 6.50%                                   | 2,270.238                 | 2,364.507                                  | 56.64%                                       | 56.64%                                    | 2.23%                                    | 0.91%                        |
| 2032                                    | 6.50%                       | 2,311.262                 | 2,446.175                                  | 57.04%                                       | 57.04%                                    | 2.48%                                    | 0.95%                        | 6.50%                            | 6.50%                                   | 2,321.724                 | 2,417.879                                  | 57.65%                                       | 57.65%                                    | 2.26%                                    | 1.01%                        |
| 2033                                    | 6.50%                       | 2,367.884                 | 2,508.347                                  | 58.11%                                       | 58.11%                                    | 2.54%                                    | 1.07%                        | 6.50%                            | 6.50%                                   | 2,375.825                 | 2,474.065                                  | 58.77%                                       | 58.77%                                    | 2.32%                                    | 1.13%                        |
| 2034                                    | 6.50%                       | 2,426.103                 | 2,572.285                                  | 59.32%                                       | 59.32%                                    | 2.55%                                    | 1.21%                        | 6.50%                            | 6.50%                                   | 2,431.257                 | 2,531.737                                  | 60.04%                                       | 60.04%                                    | 2.33%                                    | 1.26%                        |
| 2035                                    | 6.50%                       | 2,485.514                 | 2,637.580                                  | 60.69%                                       | 60.69%                                    | 2.54%                                    | 1.37%                        | 6.50%                            | 6.50%                                   | 2,487.570                 | 2,590.412                                  | 61.45%                                       | 61.45%                                    | 2.32%                                    | 1.42%                        |
| 2036                                    | 6.50%                       | 2,545.739                 | 2,703.782                                  | 62.24%                                       | 62.24%                                    | 2.51%                                    | 1.55%                        | 6.50%                            | 6.50%                                   | 2,544.355                 | 2,649.597                                  | 63.05%                                       | 63.05%                                    | 2.28%                                    | 1.59%                        |
| 2037                                    | 6.50%                       | 2,607.506                 | 2,771.748                                  | 64.06%                                       | 64.06%                                    | 2.51%                                    | 1.82%                        | 6.50%                            | 6.50%                                   | 2,602.322                 | 2,710.117                                  | 64.89%                                       | 64.89%                                    | 2.28%                                    | 1.84%                        |
| 2038                                    | 6.50%                       | 2,670.866                 | 2,841.471                                  | 66.12%                                       | 66.12%                                    | 2.52%                                    | 2.05%                        | 6.50%                            | 6.50%                                   | 2,661.512                 | 2,771.967                                  | 66.96%                                       | 66.96%                                    | 2.28%                                    | 2.07%                        |
| 2039                                    | 6.50%                       | 2,736.044                 | 2,913.116                                  | 68.44%                                       | 68.44%                                    | 2.52%                                    | 2.32%                        | 6.50%                            | 6.50%                                   | 2,722.139                 | 2,835.325                                  | 69.27%                                       | 69.27%                                    | 2.29%                                    | 2.32%                        |
| 2040                                    | 6.50%                       | 2,803.277                 | 2,987.035                                  | 71.07%                                       | 71.07%                                    | 2.54%                                    | 2.63%                        | 6.50%                            | 6.50%                                   | 2,784.424                 | 2,900.518                                  | 71.87%                                       | 71.87%                                    | 2.30%                                    | 2.59%                        |
| 2041                                    | 6.50%                       | 2,873.297                 | 3,063.875                                  | 74.04%                                       | 74.04%                                    | 2.57%                                    | 2.97%                        | 6.50%                            | 6.50%                                   | 2,849.128                 | 2,968.240                                  | 74.77%                                       | 74.77%                                    | 2.33%                                    | 2.90%                        |
| 2042                                    | 6.50%                       | 2,945.055                 | 3,142.533                                  | 77.38%                                       | 77.38%                                    | 2.57%                                    | 3.34%                        | 6.50%                            | 6.50%                                   | 2,915.184                 | 3,037.366                                  | 78.01%                                       | 78.01%                                    | 2.33%                                    | 3.24%                        |
| 2043                                    | 6.50%                       | 3,018.668                 | 3,223.156                                  | 81.13%                                       | 81.13%                                    | 2.57%                                    | 3.75%                        | 6.50%                            | 6.50%                                   | 2,982.685                 | 3,108.007                                  | 81.61%                                       | 81.61%                                    | 2.33%                                    | 3.60%                        |
| 2044                                    | 6.50%                       | 3,093.576                 | 3,305.205                                  | 85.33%                                       | 85.33%                                    | 2.55%                                    | 4.20%                        | 6.50%                            | 6.50%                                   | 3,051.042                 | 3,179.578                                  | 85.60%                                       | 85.60%                                    | 2.30%                                    | 3.99%                        |
| 2045                                    | 6.50%                       | 3,169.954                 | 3,388.879                                  | 90.00%                                       | 90.00%                                    | 2.53%                                    | 4.67%                        | 6.50%                            | 6.50%                                   | 3,120.418                 | 3,252.262                                  | 90.00%                                       | 90.00%                                    | 2.29%                                    | 4.40%                        |
| Total Contributions FY 2022-2045        |                             | \$59,197.155              | \$62,722.766                               |  |   |  |                              |                                  |   | \$59,153.492              | \$61,607.097                               |  |   |  |                              |
| Total Present Value FY 2022-2045        |                             | \$28,756.814              | \$30,371.266                               |  |   |  |                              |                                  |   | \$28,824.351              | \$30,013.892                               |  |   |  |                              |
| Difference from June 30, 2021 Valuation |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   |  |                              |
| Total Contributions FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | -\$43.663                 | -\$1,115.669                               |  |   |  |                              |
| Total Present Value FY 2022-2045        |                             | \$0.000                   | \$0.000                                    |  |   |  |                              |                                  |   | \$67.537                  | -\$357.374                                 |  |   |  |                              |
| Maximum Annual Increase                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | 3.77%                                    | 4.40%                        |
| Maximum Annual Decrease                 |                             |                           |  |  |   |  |                              |                                  |   |                           |  |  |   | -0.74%                                   | 0.66%                        |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



### State Universities Retirement System Comparison of Actuarial Valuation Results and Sensitivity Scenario 8 (Increase Percentage of Future New Hires Who Elect RSP by 15%) Based on Actuarial Valuation as of June 30, 2021

\$ in Millions

| June 30, 2021 Valuation Baseline        |            |               |              |              |              |              |       | Stress Test Scenario 8 |             |               |              |              |              |                  |       |
|---|------------|---------------|--------------|--------------|--------------|--------------|-------|------------------------|-------------|---------------|--------------|--------------|--------------|------------------|-------|
| Year Ending                             | Projected  | Total         | Actuarial    | Market Value | Increase in  | Increase in  |       | Annual Rate            | Cumulative  | Total         | Actuarial    | Market Value | Increase in  | Increase in      |       |
| June 30                                 | Investment | Statutory     | Value of     | of Assets    | Total        | AVA          |       | of                     | Geometric   | Statutory     | Value of     | of Assets    | Total        | AVA              |       |
|   | Return     | Contribution  | Assets (AVA) | (MVA)        | Contribution | Funded Ratio |       | Return                 | (from 2022) | Contribution  | Assets (AVA) | (MVA)        | Contribution | Funded Ratio     |       |
|   |            | Including RSP | Funded Ratio | Funded Ratio | Contribution |              |       |                        |             | Including RSP | Funded Ratio | Funded Ratio | Contribution | AVA Funded Ratio |       |
| 2021                                    |            | \$1,978.743   | \$2,064.105  | 43.94%       | 48.61%       |              |       | 23.75%                 |             | \$1,978.743   | \$2,064.105  | 43.94%       | 48.61%       |                  |       |
| 2022                                    | 6.50%      | 2,054.958     | 2,142.017    | 45.94%       | 49.44%       | 3.77%        | 2.01% | 6.50%                  | 6.50%       | 2,050.877     | 2,142.017    | 45.93%       | 49.43%       | 3.77%            | 1.99% |
| 2023                                    | 6.50%      | 2,070.405     | 2,160.874    | 47.84%       | 50.28%       | 0.88%        | 1.90% | 6.50%                  | 6.50%       | 2,062.267     | 2,160.874    | 47.80%       | 50.23%       | 0.88%            | 1.87% |
| 2024                                    | 6.50%      | 2,087.445     | 2,182.600    | 49.74%       | 51.09%       | 1.01%        | 1.90% | 6.50%                  | 6.50%       | 2,064.358     | 2,170.773    | 49.63%       | 50.99%       | 0.46%            | 1.84% |
| 2025                                    | 6.50%      | 2,079.468     | 2,179.480    | 51.83%       | 51.83%       | -0.14%       | 2.09% | 6.50%                  | 6.50%       | 2,057.375     | 2,172.219    | 51.66%       | 51.66%       | 0.07%            | 2.03% |
| 2026                                    | 6.50%      | 2,072.081     | 2,176.897    | 52.51%       | 52.51%       | -0.12%       | 0.68% | 6.50%                  | 6.50%       | 2,051.361     | 2,174.470    | 52.28%       | 52.28%       | 0.10%            | 0.61% |
| 2027                                    | 6.50%      | 2,056.228     | 2,165.869    | 53.11%       | 53.11%       | -0.51%       | 0.60% | 6.50%                  | 6.50%       | 2,037.077     | 2,168.409    | 52.81%       | 52.81%       | -0.28%           | 0.54% |
| 2028                                    | 6.50%      | 2,104.469     | 2,218.973    | 53.76%       | 53.76%       | 2.45%        | 0.65% | 6.50%                  | 6.50%       | 2,086.641     | 2,226.214    | 53.40%       | 53.40%       | 2.67%            | 0.58% |
| 2029                                    | 6.50%      | 2,154.325     | 2,273.781    | 54.46%       | 54.46%       | 2.47%        | 0.71% | 6.50%                  | 6.50%       | 2,138.026     | 2,285.955    | 54.04%       | 54.04%       | 2.68%            | 0.64% |
| 2030                                    | 6.50%      | 2,205.532     | 2,329.999    | 55.24%       | 55.24%       | 2.47%        | 0.77% | 6.50%                  | 6.50%       | 2,190.985     | 2,347.342    | 54.76%       | 54.76%       | 2.69%            | 0.71% |
| 2031                                    | 6.50%      | 2,257.499     | 2,387.089    | 56.09%       | 56.09%       | 2.45%        | 0.85% | 6.50%                  | 6.50%       | 2,244.947     | 2,409.858    | 55.55%       | 55.55%       | 2.66%            | 0.79% |
| 2032                                    | 6.50%      | 2,311.262     | 2,446.175    | 57.04%       | 57.04%       | 2.48%        | 0.95% | 6.50%                  | 6.50%       | 2,300.925     | 2,474.595    | 56.43%       | 56.43%       | 2.69%            | 0.89% |
| 2033                                    | 6.50%      | 2,367.884     | 2,508.347    | 58.11%       | 58.11%       | 2.54%        | 1.07% | 6.50%                  | 6.50%       | 2,359.998     | 2,542.683    | 57.45%       | 57.45%       | 2.75%            | 1.01% |
| 2034                                    | 6.50%      | 2,426.103     | 2,572.285    | 59.32%       | 59.32%       | 2.55%        | 1.21% | 6.50%                  | 6.50%       | 2,420.925     | 2,612.810    | 58.60%       | 58.60%       | 2.76%            | 1.16% |
| 2035                                    | 6.50%      | 2,485.514     | 2,637.580    | 60.69%       | 60.69%       | 2.54%        | 1.37% | 6.50%                  | 6.50%       | 2,483.349     | 2,684.640    | 59.92%       | 59.92%       | 2.75%            | 1.32% |
| 2036                                    | 6.50%      | 2,545.739     | 2,703.782    | 62.24%       | 62.24%       | 2.51%        | 1.55% | 6.50%                  | 6.50%       | 2,546.920     | 2,757.765    | 61.44%       | 61.44%       | 2.72%            | 1.51% |
| 2037                                    | 6.50%      | 2,607.506     | 2,771.748    | 64.06%       | 64.06%       | 2.51%        | 1.82% | 6.50%                  | 6.50%       | 2,612.382     | 2,833.071    | 63.22%       | 63.22%       | 2.73%            | 1.79% |
| 2038                                    | 6.50%      | 2,670.866     | 2,841.471    | 66.12%       | 66.12%       | 2.52%        | 2.05% | 6.50%                  | 6.50%       | 2,679.800     | 2,910.553    | 65.26%       | 65.26%       | 2.73%            | 2.04% |
| 2039                                    | 6.50%      | 2,736.044     | 2,913.116    | 68.44%       | 68.44%       | 2.52%        | 2.32% | 6.50%                  | 6.50%       | 2,749.405     | 2,990.362    | 67.59%       | 67.59%       | 2.74%            | 2.33% |
| 2040                                    | 6.50%      | 2,803.277     | 2,987.035    | 71.07%       | 71.07%       | 2.54%        | 2.63% | 6.50%                  | 6.50%       | 2,821.450     | 3,072.873    | 70.25%       | 70.25%       | 2.76%            | 2.66% |
| 2041                                    | 6.50%      | 2,873.297     | 3,063.875    | 74.04%       | 74.04%       | 2.57%        | 2.97% | 6.50%                  | 6.50%       | 2,896.642     | 3,158.685    | 73.28%       | 73.28%       | 2.79%            | 3.03% |
| 2042                                    | 6.50%      | 2,945.055     | 3,142.533    | 77.38%       | 77.38%       | 2.57%        | 3.34% | 6.50%                  | 6.50%       | 2,973.947     | 3,246.722    | 76.72%       | 76.72%       | 2.79%            | 3.44% |
| 2043                                    | 6.50%      | 3,018.668     | 3,223.156    | 81.13%       | 81.13%       | 2.57%        | 3.75% | 6.50%                  | 6.50%       | 3,053.506     | 3,337.161    | 80.63%       | 80.63%       | 2.79%            | 3.90% |
| 2044                                    | 6.50%      | 3,093.576     | 3,305.205    | 85.33%       | 85.33%       | 2.55%        | 4.20% | 6.50%                  | 6.50%       | 3,134.788     | 3,429.509    | 85.04%       | 85.04%       | 2.77%            | 4.41% |
| 2045                                    | 6.50%      | 3,169.954     | 3,388.879    | 90.00%       | 90.00%       | 2.53%        | 4.67% | 6.50%                  | 6.50%       | 3,217.978     | 3,523.985    | 90.00%       | 90.00%       | 2.75%            | 4.96% |
| Total Contributions FY 2022-2045        |            | \$59,197.155  | \$62,722.766 |              |              |              |       |                        |             | \$59,235.929  | \$63,833.545 |              |              |                  |       |
| Total Present Value FY 2022-2045        |            | \$28,756.814  | \$30,371.266 |              |              |              |       |                        |             | \$28,689.277  | \$30,728.640 |              |              |                  |       |
| Difference from June 30, 2021 Valuation |            |               |              |              |              |              |       |                        |             |               |              |              |              |                  |       |
| Total Contributions FY 2022-2045        |            | \$0.000       | \$0.000      |              |              |              |       |                        |             | \$38.774      | \$1,110.779  |              |              |                  |       |
| Total Present Value FY 2022-2045        |            | \$0.000       | \$0.000      |              |              |              |       |                        |             | -\$67.537     | \$357.374    |              |              |                  |       |
| Maximum Annual Increase                 |            |               |              |              |              |              |       |                        |             |               |              |              | 3.77%        | 4.96%            |       |
| Maximum Annual Decrease                 |            |               |              |              |              |              |       |                        |             |               |              |              | -0.28%       | 0.54%            |       |

Total statutory contributions include contributions from both the State and employers and include total RSP contributions. Total statutory contributions exclude EBA contributions.

The contributions are discounted to a present value based on the actuarial valuation interest rate of 6.50 percent.



**State Universities Retirement System**  
**Comparison of Assumed Investment Returns Used in the Stress Testing Scenarios and Total Statutory Contributions**  
**Based on Actuarial Valuation as of June 30, 2021**

| Year | Baseline | Scenario 1 (6.50% Volatile) |                        | Scenario 2 (6.50% Volatile) |                        | Scenario 3 (5.75% Volatile) |                        | Scenario 4 (4.80% Volatile) |                        |
|------|----------|-----------------------------|------------------------|-----------------------------|------------------------|-----------------------------|------------------------|-----------------------------|------------------------|
|      |          | Nominal <sup>1</sup>        | Geometric <sup>2</sup> |
| 2022 | 6.50%    | 4.31%                       | 4.31%                  | 1.58%                       | 1.58%                  | -0.39%                      | -0.39%                 | 15.77%                      | 15.77%                 |
| 2023 | 6.50%    | -6.25%                      | -1.11%                 | 22.12%                      | 11.38%                 | 8.99%                       | 4.19%                  | 7.58%                       | 11.60%                 |
| 2024 | 6.50%    | -8.39%                      | -3.60%                 | 10.14%                      | 10.96%                 | -5.81%                      | 0.75%                  | -7.43%                      | 4.86%                  |
| 2025 | 6.50%    | 9.57%                       | -0.46%                 | 5.51%                       | 9.57%                  | 4.17%                       | 1.59%                  | 7.77%                       | 5.58%                  |
| 2026 | 6.50%    | 2.24%                       | 0.07%                  | 9.56%                       | 9.57%                  | 9.34%                       | 3.10%                  | 8.77%                       | 6.21%                  |
| 2027 | 6.50%    | 26.15%                      | 4.01%                  | -3.60%                      | 7.26%                  | 10.90%                      | 4.36%                  | -7.40%                      | 3.81%                  |
| 2028 | 6.50%    | 24.72%                      | 6.74%                  | 13.70%                      | 8.15%                  | 18.06%                      | 6.21%                  | 33.18%                      | 7.57%                  |
| 2029 | 6.50%    | -9.24%                      | 4.60%                  | 14.40%                      | 8.92%                  | 12.26%                      | 6.95%                  | 8.53%                       | 7.69%                  |
| 2030 | 6.50%    | -4.78%                      | 3.51%                  | -4.93%                      | 7.28%                  | 8.47%                       | 7.12%                  | 9.05%                       | 7.84%                  |
| 2031 | 6.50%    | 6.92%                       | 3.85%                  | 11.49%                      | 7.70%                  | 7.72%                       | 7.18%                  | -11.06%                     | 5.78%                  |
| 2032 | 6.50%    | 11.17%                      | 4.49%                  | -0.46%                      | 6.93%                  | -12.55%                     | 5.21%                  | 4.64%                       | 5.68%                  |
| 2033 | 6.50%    | 14.15%                      | 5.27%                  | 1.19%                       | 6.44%                  | 19.62%                      | 6.35%                  | 7.04%                       | 5.79%                  |
| 2034 | 6.50%    | 9.05%                       | 5.55%                  | 5.22%                       | 6.34%                  | -1.86%                      | 5.69%                  | -9.22%                      | 4.55%                  |
| 2035 | 6.50%    | 12.13%                      | 6.01%                  | -12.83%                     | 4.84%                  | 4.86%                       | 5.63%                  | -12.85%                     | 3.20%                  |
| 2036 | 6.50%    | 12.29%                      | 6.42%                  | 6.99%                       | 4.99%                  | -3.23%                      | 5.02%                  | 10.78%                      | 3.69%                  |
| 2037 | 6.50%    | -2.04%                      | 5.87%                  | 20.56%                      | 5.90%                  | -4.26%                      | 4.41%                  | 9.07%                       | 4.02%                  |
| 2038 | 6.50%    | 16.91%                      | 6.49%                  | 18.56%                      | 6.60%                  | 4.45%                       | 4.41%                  | 21.74%                      | 4.99%                  |
| 2039 | 6.50%    | 7.13%                       | 6.52%                  | 12.83%                      | 6.94%                  | 22.77%                      | 5.36%                  | 6.96%                       | 5.09%                  |
| 2040 | 6.50%    | 26.35%                      | 7.48%                  | -12.96%                     | 5.79%                  | 10.62%                      | 5.63%                  | -0.85%                      | 4.77%                  |
| 2041 | 6.50%    | 6.22%                       | 7.42%                  | 19.87%                      | 6.45%                  | 0.97%                       | 5.39%                  | 15.19%                      | 5.27%                  |
| 2042 | 6.50%    | -5.37%                      | 6.77%                  | 12.68%                      | 6.74%                  | 5.29%                       | 5.38%                  | 14.01%                      | 5.67%                  |
| 2043 | 6.50%    | 3.17%                       | 6.61%                  | 21.69%                      | 7.38%                  | 8.33%                       | 5.52%                  | -11.04%                     | 4.85%                  |
| 2044 | 6.50%    | 2.73%                       | 6.44%                  | 4.17%                       | 7.24%                  | 11.72%                      | 5.78%                  | 15.87%                      | 5.30%                  |
| 2045 | 6.50%    | 7.92%                       | 6.50%                  | -9.06%                      | 6.50%                  | 5.08%                       | 5.75%                  | -6.18%                      | 4.80%                  |

<sup>1</sup>Nominal one-year rate of return.

<sup>2</sup>Cumulative average geometric return from 2022 through the current year.

