State Employees' Retirement System of Illinois

Annual Actuarial Valuation as of June 30, 2018

GRS Retirement Consulting

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November 15, 2018

Board of Trustees
State Employees' Retirement System of Illinois
Springfield, Illinois

Re: State Employees' Retirement System of Illinois Actuarial Valuation as of June 30, 2018

Dear Board Members:

The results of the June 30, 2018, Annual Actuarial Valuation of the State Employees' Retirement System of Illinois ("SERS" or "System") are presented in this report. The purposes of the actuarial valuation are to measure the System's funding status and to determine the State's contribution rate for the fiscal year beginning July 1, 2019, and ending June 30, 2020. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with benefits described in this report for purposes other than those identified above, may be significantly different.

Gabriel, Roeder, Smith & Company ("GRS") has prepared this report exclusively for the Trustees of the State Employees' 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 SERS only in its entirety and only with the permission of the Trustees.

The State's contribution rate has been determined under Illinois statues, in particular under 40 ILCS Section 5/14-131. Information required by GASB Statement Nos. 67 and 68 are provided in a separate report. The System's current contribution rate determined under the statutory funding policy may not conform with the Actuarial Standards of Practice. Therefore, the Board adopted an actuarial funding policy to be used to calculate the Actuarially Determined Contribution ("ADC") under GASB Statement Nos. 67 and 68 for financial reporting purposes.

Although the 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 adherence to a funding policy, such as the Board policy used to calculate the ADC under GASB Statement Nos. 67 and 68 that funds the normal cost of the plan as well as an amortization payment that seeks to pay off any unfunded accrued liability over a closed-period of 25 years.

The contribution requirement in this report is determined using the actuarial assumptions and methods disclosed in Section E of this report. This report includes risk metrics beginning on page 16, but does not include a more robust assessment of the risks if future experience deviates from the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This actuarial valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through June 30, 2018. The actuarial valuation was based upon information furnished by SERS staff, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability 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 SERS staff.

This report was prepared using actuarial assumptions adopted by the Board as authorized under the Illinois Pension Code. The actuarial assumptions used for the June 30, 2018, actuarial valuation are based on a full experience review for the four-year period ended June 30, 2013, a modified experience review for the three-year period ended June 30, 2015, and the 2018 economic assumption review. Pursuant to Public Act 99-0232, SERS is required to conduct an actuarial experience review once every three years. Under this schedule, an experience review for the period from July 1, 2015, through June 30, 2018, will be performed after completion of the June 30, 2018, actuarial valuation with expected implementation of the recommended assumptions beginning with the June 30, 2019, actuarial valuation. All actuarial assumptions used in this report are reasonable for the purposes of this actuarial valuation. Additional information about the actuarial assumptions is included in Section E of his report entitled Actuarial Methods and Assumptions.

Public Act 100-0023, effective July 6, 2017, modified the State's funding policy beginning with fiscal year 2018, by phasing in contribution rate variances due to changes in actuarial assumptions over a five-year period. Additionally, Public Act 100-0023 created a new benefit plan option (Optional Hybrid Plan – "Tier 3") for certain current and future active members not covered by Social Security. The State's contribution requirements provided in this report are determined in accordance with Public Act 100-0023.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the SERS as of the actuarial valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Alex Rivera and Lance J. Weiss are Members of the American Academy of Actuaries and are independent of the plan sponsor and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

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GRS

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1938–2018

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SECTION A

SUMMARY OF ACTUARIAL VALUATION RESULTS

Summary of the Actuarial Valuation Results

Introduction

The law governing the State Employees' Retirement System of Illinois ("SERS" or "System") requires the Actuary, as the technical advisor to the Board of Trustees to:

> "...make an annual valuation of the liabilities and reserves of the System, make an annual determination of the amount of contributions required from the State under this Article, and certify the results thereof to the board. (40 ILCS Section 5/14 - 138(c))."

Gabriel, Roeder, Smith & Company has been retained by the Board of Trustees to perform an actuarial valuation as of June 30, 2018. In this report, we present the results of the actuarial valuation and the appropriation requirements under Public Act 88-0593, Public Act 93-0002, Public Act 93-0839, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023 for the fiscal year ending June 30, 2020.

The actuarial valuation was completed based upon membership and financial data provided by the administrative staff of the System. The actuarial assumptions used for the June 30, 2018, actuarial valuation are based on a full experience review for the four-year period ended June 30, 2013, a modified experience review for the three-year period ended June 30, 2015, and the 2018 economic assumption review. The cost method used to determine the benefit liabilities for statutory funding is the Projected Unit Credit Cost Method. For actuarial valuation purposes, as well as projection purposes, the actuarial value of assets is based on a five-year smoothing method.

Changes Since the Last Actuarial Valuation

Recent Legislative Changes

The following recently passed Public Acts impact SERS as follows.

Public Act ("P.A.") 100-0023, effective July 6, 2017, modified the State's funding policy and created a new tier of benefits for certain current and future active members not covered by Social Security. The State's funding policy was amended to include smoothing State contribution rate increases or decreases due to changes in actuarial assumptions, including investment return assumptions, over a five-year period in equal annual amounts beginning in fiscal year 2018. In addition, changes in actuarial or investment assumptions that increased or decreased the State contribution rate in fiscal years 2014 through 2017 are to be smoothed over a five-year period in equal annual amounts, applying only to the portion of the five-year phase-in that is applicable to fiscal years on and after 2018. The fiscal year 2018 State contribution was recertified, pursuant to P.A. 100-0023.

P.A. 100-0023 created a Hybrid ("Tier 3") plan comprised of a defined benefit plan and a defined contribution plan to serve as an optional plan in lieu of the traditional Tier 2 defined benefit plan for current and future Tier 2 active members not covered by Social Security. The Tier 3 plan is expected to be available to applicable members beginning in fiscal year 2020. The election process for current Tier 2 members will be developed by the System.

Public Act 100-0587, effective June 4, 2018, created two voluntary buyout programs (Accelerated Pension Benefit Payment Program) for eligible members beginning on the implementation date and ending on June 30, 2021. The two accelerated pension benefit payment options offered include: (1) for vested inactive members, a payment equal to 60 percent of the present value of the member's pension benefit in lieu of receiving any pension benefit, and (2) for active Tier 1 members eligible for retirement, a payment equal to 70 percent of the difference between: (i) the present value of the automatic annual increases (AAI) to a Tier 1 member's retirement 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 summary of the SERS plan provisions is included in Section F of this report.

Actuarial Assumptions and Methods

The actuarial valuation results summarized in this report involve actuarial calculations that require assumptions about future events. Most of the actuarial assumptions used for the June 30, 2018, actuarial valuation are based on a full experience review for the four-year period ended June 30, 2013, and a modified experience review for the three-year period ended June 30, 2015, which became effective with the June 30, 2016, actuarial valuation. At the Board's request, GRS reviews economic assumptions on an annual basis. The economic assumptions reviewed include:

- Investment return assumption;
- General inflation; and
- Wage inflation and salary increases.

As a result of the 2018 economic assumption review, the Board approved the following changes to the economic assumptions to be used in the June 30, 2018, actuarial valuation:

- Reduced the general (price) inflation assumption from 2.75 percent to 2.50 percent; and
- Reduced the wage inflation assumption from 3.25 percent to 3.00 percent.

The change in the economic assumptions detailed above decreased the actuarial accrued liability as of June 30, 2018, by $214.0 million.

Pursuant to Public Act 99-0232, SERS is required to conduct an actuarial experience review once every three years. Under this schedule, an experience review for the period from July 1, 2015 through June 30, 2018, will be performed after completion of the June 30, 2018, actuarial valuation with expected implementation of the recommended assumptions beginning with the June 30, 2019, actuarial valuation.

Tier 3 Participation Assumptions for Funding Projections

As of June 30, 2018, the System has approximately 570 Tier 2 active members not covered by Social Security that may irrevocably elect the Tier 3 plan. Given the uncertainty of the election behavior and small population size of this group, we have assumed these members would remain in Tier 2. We will

review emerging experience for future Tier 3 members in subsequent actuarial valuations and if necessary, will provide recommended assumptions.

In order to determine the State's contribution rate, open-group projections through fiscal year 2045 are performed. The open group includes current and future plan members. The active member population is assumed to remain level at its current state of 61,397 members over the 27-year projection period. Currently, there are approximately 2,300 active members not covered by Social Security. As these members leave active population, they are assumed to be replaced by new entrants at the rate necessary to keep the population constant at 2,300 members. Future members of this group may elect to participate in either the Tier 2 or Tier 3 benefit plan. Given the uncertainty of Tier 3 participation, we have assumed all future members not covered by Social Security would participate in Tier 2.

Accelerated Pension Benefit Payment Program Participation Assumptions

The voluntary buyout programs established under P.A. 100-0587 will be available for eligible members during the period from December 1, 2018 through June 30, 2021. Participation in the Accelerated Pension Benefit Payment Program will be monitored as experience emerges and an assumption will be developed regarding the buyout election percentage for use in future valuations.

On the following page is a summary of the key actuarial valuation results for the current and prior plan years.

Summary of the Actuarial Valuation Results

Actuarial Valuation Date:	June 30, 2018	June 30, 2017
Fiscal Year Ending:	**June 30, 2020**	**June 30, 2019**
Estimated Statutory Contributions:		
· Annual Amount[a]	$ 2,291,249,000	$ 2,136,279,000
· Percentage of Projected Capped Payroll for Fiscal Year	52.150%	49.593%
Actuarially Determined Contribution[b] (ADC):		
· Annual Amount	$ 2,834,360,456	$ 2,818,880,078
· Percentage of Projected Capped Payroll for Fiscal Year	64.512%	65.439%
Membership		
· Number of		
- Active Members	61,397	60,612
- Members Receiving Payments	73,179	71,805
- Members Eligible for Deferred Benefits	201	199
- Total	134,777	132,616
· Covered Payroll Provided by the System	$ 4,243,741,707	$ 4,195,777,563
· Projected Capped Payroll for Fiscal Year[c]	$ 4,393,573,724	$ 4,307,621,109
· Annualized Benefit Payments	$ 2,498,801,118	$ 2,365,080,898
Assets		
· Market Value of Assets (MVA)	$ 17,463,278,241	$ 16,530,179,792
· Actuarial Value of Assets (AVA)	$ 17,478,139,578	$ 16,558,873,542
· Return on MVA	7.68%	12.19%
· Return on AVA	7.58%	8.06%
· Ratio – AVA to MVA	100.09%	100.17%
Actuarial Information		
· Employer Normal Cost Amount	$ 632,803,896	$ 668,709,844
· Actuarial Accrued Liability (AAL)	$ 47,925,682,793	$ 46,701,348,277
· Unfunded Actuarial Accrued Liability (UAAL)	$ 30,447,543,215	$ 30,142,474,735
· Funded Ratio based on AVA	36.47%	35.46%
· UAAL as % of Covered Payroll Provided by the System	717.47%	718.40%
· Funded Ratio based on MVA	36.44%	35.40%

[a] *The estimated statutory contribution amounts for fiscal years 2019 and 2020 are based on projected capped payrolls for fiscal years 2019 and 2020, respectively, using June 30, 2018, census data.*

[b] *For fiscal years ending on and after June 30, 2017, the Board adopted a recommended policy used to develop the Actuarially Determined Contribution (ADC) as defined in GASB Statement Nos. 67 and 68. The policy adopted by the Board calculates the ADC as the Normal Cost plus a 25-year level percent of capped payroll closed-period amortization of the Unfunded Accrued Liability. As of June 30, 2018, the remaining amortization period is 22 years. The ADC is used for financial reporting purposes only.*

[c] *Based on June 30, 2018, census data.*

Appropriation Requirements under P.A. 88-0593, P.A. 93-0002, P.A. 93-0839, P.A. 94-0004, P.A. 96-0043 and P.A. 100-0023

The law governing the System under P.A. 88-0593 provides that:

For fiscal years 2011 through 2045, the minimum contribution to the System for each fiscal year shall be an amount determined to be sufficient to cause the total assets of the System to equal 90 percent of the total actuarial liabilities of the System by the end of fiscal year 2045. In making these determinations, the required contribution shall be calculated each year as a level-percentage-of-payroll over the years remaining to and including fiscal year 2045 and shall be determined under the projected unit credit actuarial cost method. For fiscal years 1997 through 2010, the minimum contribution to the System, as a percentage of the payroll, shall be increased in equal annual increments so that by fiscal year 2010, the contribution rate is at the same level as the contribution rate for fiscal years 2011 through 2045.

The above calculation provides the basis for calculating the appropriation requirements under P.A. 93-0002. For fiscal years 2005 and later, the contributions under P.A. 93-0002 start with a calculation of the contribution based upon the hypothetical asset value which assumes no infusion from the proceeds of the General Obligation Bond ("GOB") sale that were deposited July 1, 2003 (Table 4a). This contribution is then reduced by the debt service beginning in fiscal year 2005 to produce the maximum contribution. For fiscal years 2006 and 2007, the maximum contribution is equal to the contribution amounts stated in P.A. 94-0004 for each respective year. The contribution amounts stated in P.A. 94-0004 are $203,783,900 for fiscal year 2006 and $344,164,400 for fiscal year 2007. A second projection is performed to develop the P.A. 88-0593 formula rate, which includes the GOB deposit. The lower of this formula rate with the GOB assets included and the maximum contribution is the required state appropriation (Table 4b).

Pursuant to Public Act 96-0043, $723,703,100 of the total required State contribution for fiscal year 2010 will be paid from the proceeds of a GOB sale.

Pursuant to Public Act 96-0043, for the calculation of the fiscal year 2011 contribution and beyond, the value of the System's assets shall be equal to the actuarial value of the System's assets. As of June 30, 2008, the actuarial value of the System's assets shall be equal to the market value of the assets as of that date. In determining the actuarial value of the System's assets for fiscal years after June 30, 2008, any actuarial gains or losses from investment return incurred in a fiscal year shall be recognized in equal annual amounts over the five-year period following that fiscal year. Furthermore, for purposes of determining the required State contribution to the System for a particular year, the projected actuarial value of assets shall be assumed to earn a rate of return equal to the System's actuarially assumed rate of return.

Public Act ("P.A.") 100-0023, effective July 6, 2017, modified the State's funding policy to include smoothing State contribution rate increases or decreases due to changes in actuarial assumptions, including investment return assumptions, over a five-year period in equal annual amounts beginning in fiscal year 2018. In addition, changes in actuarial or investment assumptions that increased or decreased the State contribution rate in fiscal years 2014 through 2017 are to be smoothed over a five-year period in equal annual amounts, applying only to the portion of the five-year phase-in that is applicable to fiscal years on and after 2018. The development of the contribution rate phase-in schedule that applies to State contribution rates determined on and after fiscal year 2018 is provided on page 50.

Development of the Actuarial Value of Assets Based upon the Market Value of Assets

The following tables outline the reconciliation of the market value of assets and the development of the hypothetical asset value as of June 30, 2018. Also, the tables show the development of the actuarial value of assets under both the market value and the hypothetical value of assets.

1.	Market Value of Assets 6/30/2017	$ 16,530,179,792
2.	Actual State Contribution Amount	1,929,175,044
3.	Employee Contribution Amount	254,442,466
4.	Benefit Payouts & Refunds	(2,492,301,370)
5.	Administrative Expenses	(15,257,526)
6.	Investment Income	1,257,039,835
7.	Market Value of Assets 6/30/2018	$ 17,463,278,241
8.	Expected Investment Return at 7.00%	1,145,966,396
9.	Investment Gain/(Loss) Current Year	111,073,439
10.	Deferred Investment Gains and (Losses) All Years	(14,861,337)
11.	Actuarial Value of Assets 6/30/2018 (7. - 10.)	$ 17,478,139,578

Development of the Actuarial Value of Assets Based upon the Hypothetical Value of Assets

The hypothetical asset value assumes no infusion from the proceeds of the GOB sale that were deposited July 1, 2003.

1.	Hypothetical Value of Assets 6/30/2017	$ 15,043,590,209
2.	State Contribution Amount[a]	2,043,430,143
3.	Employee Contribution Amount	254,442,466
4.	Benefit Payouts & Refunds	(2,492,301,370)
5.	Administrative Expenses	(15,257,526)
6.	Investment Income[b]	1,147,444,706
7.	Hypothetical Value of Assets 6/30/2018	$ 15,981,348,628
8.	Expected Investment Return at 7.00%	1,045,836,420
9.	Investment Gain/(Loss) Current Year	101,608,286
10.	Deferred Investment Gains and (Losses) All Years	(8,555,726)
11.	Hypothetical Actuarial Value of Assets 6/30/2018 (7. - 10.)	$ 15,989,904,354

[a] *Represents 48.152 percent of covered payroll provided by the System for the basic contribution. This rate was determined as part of the June 30, 2016, actuarial valuation, and recertified, pursuant to P.A. 100-0023, and is based upon the hypothetical asset value which assumes no infusion from the proceeds of the GOB sale that were deposited July 1, 2003.*

[b] *Investment income assumes hypothetical value of assets earns the Fund's actual rate of return for fiscal year 2018 of 7.68 percent.*

The development of the actuarial smoothed value of assets with GOB proceeds and the hypothetical smoothed value of assets without GOB proceeds are provided in each respective historical actuarial valuation report since the GOB proceeds were deposited into the trust.

State Contribution Requirement for Fiscal Year 2020

The fiscal years ending June 30, 2019, and June 30, 2020, certified contribution requirements and projected future year required State contribution rates and amounts, assuming deferred investments gains and losses are recognized in the assets, are as follow:

Fiscal Year Ending June 30,	Base Contribution	Debt Service Contribution	Total Contribution	Assumed Payroll (billions)	Total Required Contribution	Total Required Contribution Including Debt Service
2019	**49.593%**	**2.021%**	**51.614%**	**$4.308**	**$2,136,279,000**	**$2,223,336,000**
2020	**52.150%**	**2.140%**	**54.290%**	**4.394**	**2,291,249,000**	**2,385,271,000**
2021	53.745%	2.218%	55.963%	4.484	2,409,800,000	2,509,250,000
2022	55.228%	2.286%	57.514%	4.572	2,525,226,000	2,629,751,000
2023	54.947%	2.343%	57.290%	4.662	2,561,613,000	2,670,843,000
2024	54.824%	2.464%	57.288%	4.753	2,605,945,000	2,723,066,000
2025	54.685%	2.566%	57.251%	4.846	2,650,189,000	2,774,544,000
2026	54.665%	2.580%	57.245%	4.945	2,702,968,000	2,830,539,000
2027	54.660%	2.585%	57.245%	5.048	2,759,233,000	2,889,724,000
2028	54.575%	2.647%	57.222%	5.156	2,813,791,000	2,950,266,000

Assumed projected payroll is based on census data as of June 30, 2018.

For fiscal years 2020 through 2033, the base contribution is limited by the maximum contribution determined under the assumption that the proceeds of the GOB sale were not deposited; therefore, the contribution rate is not level as a percent of pay.

Pursuant to Public Act 96-0043, the fiscal year 2020 contribution rate is calculated assuming the actuarial value of assets as of July 1, 2018, earns a rate of return equal to the System's actuarially assumed rate of return. Pursuant to Public Act 100-0023, contribution rates for fiscal years 2019 through 2024 include smoothing of contribution rate variances due to changes in actuarial assumptions.

The contributions for fiscal years 2021 and beyond, as presented above, are developed in Tables 4c and 4d in this report. In those projections, the actuarial valuations as of June 30 for years 2019 through 2022 have been projected as though an actuarial valuation in each of those years was performed. At each projected actuarial valuation, an additional 20 percent of the investment gains and losses are recognized. The market value of assets at June 30, 2018, is assumed to have a rate of return equal to the actuarial valuation interest rate going forward. Therefore, the actuarial value of assets is calculated by adjusting the market value at each respective actuarial valuation date by the remaining percentage of the investment gains and losses. The actuarial value of assets converges to market value in 2022, when all remaining investment gains and losses have been recognized. Because the deferred asset gains and losses are incorporated into the projections, the projections found in Tables 4c and 4d do not show a stable contribution rate until the impact of the five-year asset smoothing has been fully realized.

Method of Calculation for Appropriation Requirements

The results are based on the projected unit credit actuarial cost method, the data provided and assumptions used for the June 30, 2018, actuarial valuation. In order to determine projected contribution rates and amounts, the following additional assumptions were used:

- Projected annualized payroll of $4,307,600,000 for fiscal year 2019.
- Total employer contributions of $2,136,279,000 (including no payments from the unclaimed property fund) for fiscal year 2019.
- Administrative expenses of $17,716,979 for fiscal year 2019, as provided by the System.
- New entrants whose average age is 35.99 and average pay is $49,786 (2018 dollars). These values are based on the average age and average pay of new entrants over the last 15 years.
- The active member population is assumed to remain level at 61,397 for all years of the 27-year projection.
- Current and future members not covered by Social Security are assumed to participate in Tier 2.
- Projected benefits for members hired on or after January 1, 2011, are based on the new provisions established in P.A. 96-0889.

The average increase in total uncapped payroll for the 27-year projection period is approximately 3.00 percent per year. It is important to note that benefits for new hires are based on capped payroll which is ultimately projected to grow at 1.25 percent per year. All results in this actuarial valuation assume that State contributions will be made on capped pay.

To determine the contribution rates, the expected 2019 appropriation was converted to a percentage of the expected 2019 payroll. An amortization schedule was then determined on the assumption that:

- The ratio of total assets to total actuarial liabilities will be 90 percent by June 30, 2045.
- The actuarial value of assets shall be assumed to earn a rate of return equal to the System's actuarially assumed rate of return.
- The contribution rates for fiscal years 2010 through 2033 will not be uniform, but the rate for any one of these years will be the minimum of the difference between the “without-GOB” contribution and the debt service, and the underlying formula rate as determined by Public Act 88-0593.
- The contribution rate for fiscal year 2019 will be 49.593 percent based on the certification of the June 30, 2017, actuarial valuation results issued October 31, 2017.
- The contribution rates for fiscal years 2034 through 2045 will be a uniform percentage of capped payroll.

- The contribution rates for fiscal years 2019 through 2024 are reduced according to the phase-in schedule provided on page 50.

Finally, the certified FY 2020 contribution rate of 52.150 percent is applied to actual FY 2020 capped payroll.

Observations on Actuarial Funding and Statutory Funding

GASB Statements Nos. 25, 27, 67 and 68 provide guidance for retirement plans and plan sponsors on the development of an annual expense requirement to be reported in their annual financial statements. Under the prior rules established by GASB Statements Nos. 25 and 27, this expense requirement is based on the Annual Required Contribution ("ARC"). The ARC is the sum of the normal cost and amortization of the unfunded accrued liability and represents the annual employer contributions that are projected to finance benefits for current plan members over a period not to exceed 30 years.

GASB Statements Nos. 67 and 68, which replaced GASB Statements Nos. 25 and 27, no longer use the ARC. However, measuring the Statutory Contribution against a policy such as the ARC helps evaluate the funding adequacy of the current statutory funding method. Thus, the Board adopted a policy to calculate the Actuarially Determined Contribution ("ADC"). Under this policy, the ADC is calculated as the Normal Cost plus a 25-year level percent of capped payroll closed-period amortization, as of June 30, 2015, of the Unfunded Accrued Liability.

The ADC for fiscal years 2019 and 2020, as well as the statutory contribution for fiscal years 2019 and 2020, are shown below as a percentage of projected capped payroll. The ADC and statutory contribution for 2019 are based on the results of the June 30, 2017, actuarial valuation. The dollar amount of the ADC for 2019 and 2020 and the statutory contribution for 2019 and 2020 will be the product of the actual payroll for 2019 and 2020 and the percentages shown.

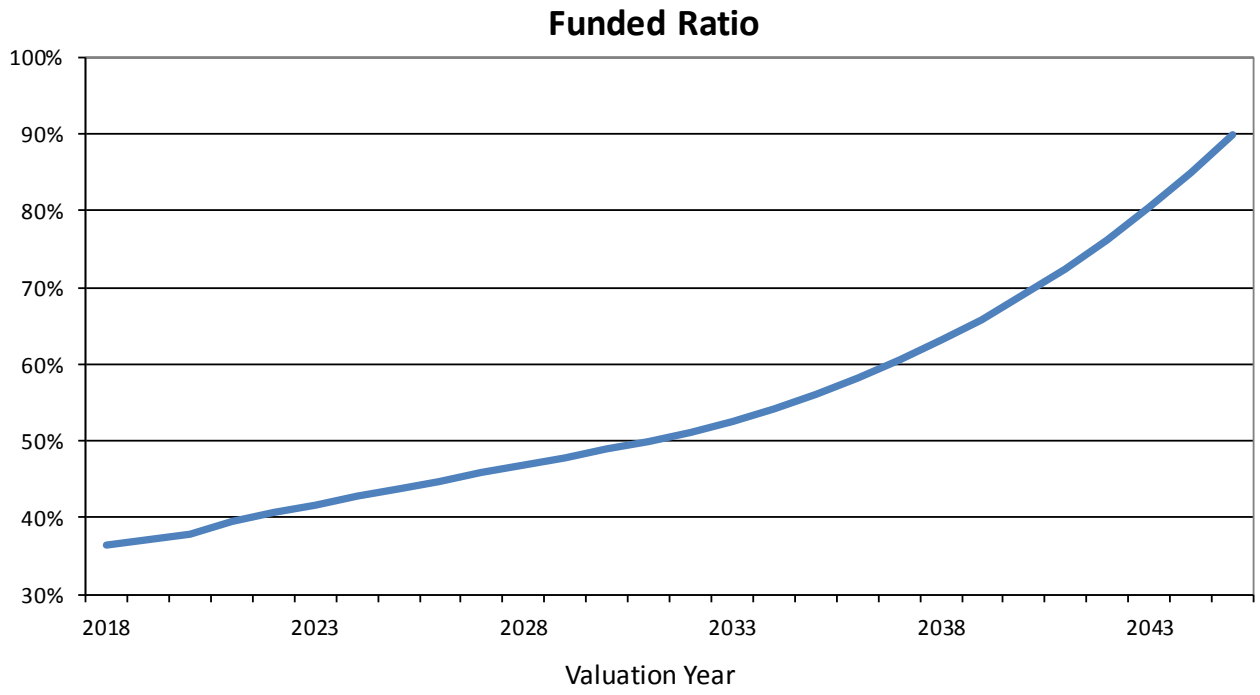
Actuarial Valuation Date:	June 30, 2018	June 30, 2017
Actuarially Determined Contributions for Fiscal Year Ending:	**June 30, 2020**	**June 30, 2019**
1. Employer normal cost	$ 632,803,896	$ 668,709,844
2. Initial Amount to amortize the unfunded liability over a 25-year closed-period, beginning July 1, 2015, as a level percentage of capped payroll	2,201,556,560	2,150,170,234
3. ADC [(1) + (2)]	$ 2,834,360,456	$ 2,818,880,078
4. Projected capped payroll for fiscal year[a]	$ 4,393,573,724	$ 4,307,621,109
5. ADC as a percentage of projected capped payroll	64.512%	65.439%
6. Estimated statutory contribution	$ 2,291,249,000	$ 2,136,279,000
7. Estimated statutory contribution as a percentage of projected capped payroll	52.150%	49.593%
8. Estimated statutory contribution as a percentage of ADC [(6) / (3)]	80.838%	75.785%

[a] *Projected capped payroll for each fiscal year is based on census data as of June 30, 2018.*

A key objective of the ADC is to accrue costs over the working lifetime of plan members to ensure that benefit obligations are satisfied, and intergenerational equity is promoted. Although the ADC is solely an accounting provision, in certain circumstances it could represent a reasonable annual funding target and therefore is used by some plan sponsors as their "de facto" funding requirement. Given there is no requirement that the accounting provision for pension expense must equal the annual funding requirement, some plan sponsors adopt funding policies that differ from the ADC. However, a funding policy that differs significantly from the ADC approach could result in a potential "back-loading," meaning contributions are deferred into the future. Back-loading could result in an underfunding of the System.

Observations on Actuarial Funding and Statutory Funding

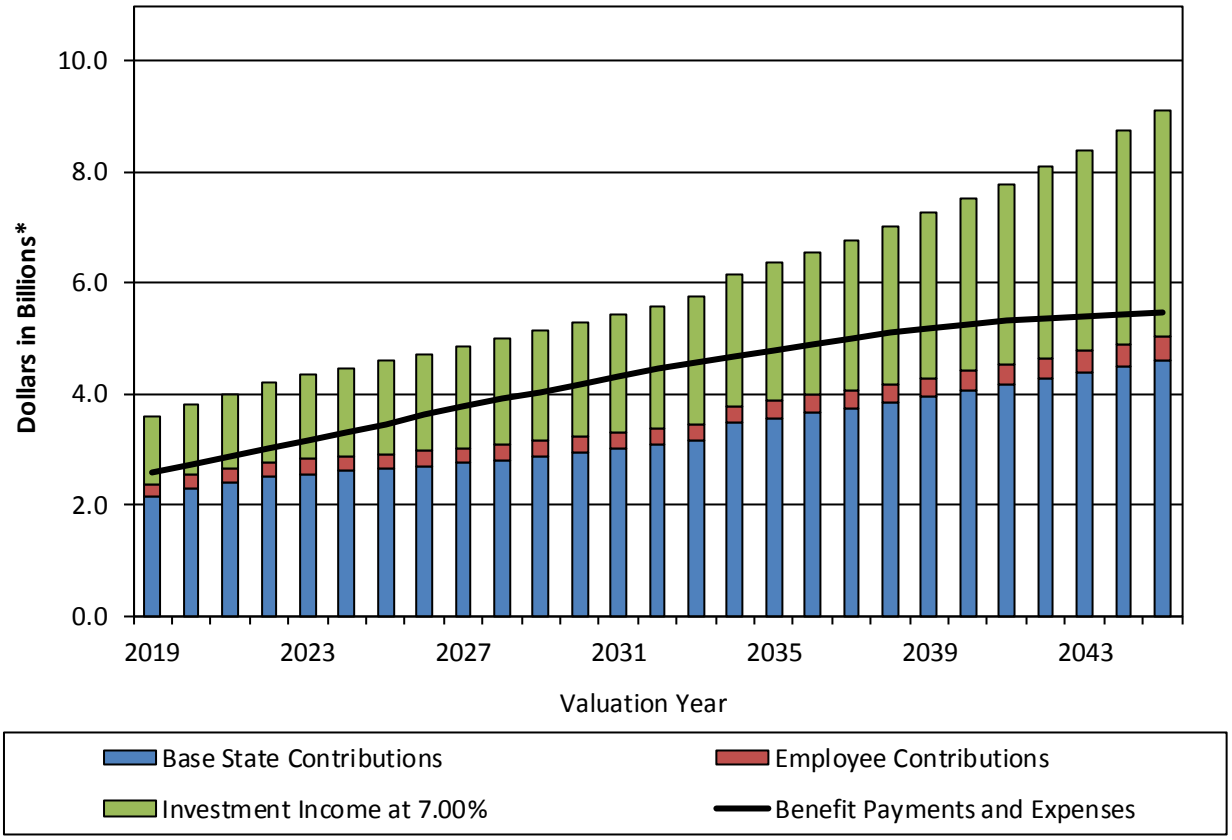
The statutory funding policy adopted for SERS provides for level percent of pay funding that produces a funding target of 90 percent by 2045, assuming an open group projection. The following graph shows the projected funded ratio. A key observation is that the funded ratio does not grow markedly until after 2033. That is, a majority of the funding occurs between 2034 and 2045. This illustrates how significantly the current funding policy defers or back-loads contributions into the future.



Observations on Actuarial Funding and Statutory Funding

The following graph compares the projected benefits and expenses against employer contributions, employee contributions and investment income. Beginning in 2019, benefits exceed State and employee contributions. From 2019 to 2033, the percentage of investment income needed to pay ongoing benefits increases from approximately 17.4 percent to 48.5 percent. This implies that a lower level of investment income is projected to be available for potential asset growth. After 2033, the percentage of investment income needed to pay ongoing benefits is projected to decrease from approximately 37.9 percent in 2034 to 11.3 percent in 2045, which is projected to cause assets to grow at a faster rate.

Comparison of Cash Flows



**Future dollar amounts are based on assumed inflationary increases.*

The provisions of P.A. 96-0043 develop a theoretical value of assets that do not recognize deferred investment gains and losses in the projection of assets used to develop the statutory contribution. This policy tends to defer contributions when plan assets experience a loss.

Given that SERS funded ratio at June 30, 2018, is only 36 percent on a market value of assets basis, and because the current statutory policy tends to back-load and defer contributions, we advise strengthening the current statutory funding policy. The Board has taken steps to strengthen the current statutory funding policy by adopting a lower assumed rate of return and more conservative assumptions. Examples of other methods to strengthen the current funding policy include:

1. Increasing the 90 percent funding target to 100 percent;
2. Reducing the projection period needed to reach the funding target;
3. Eliminating the maximum contribution cap; and
4. Changing the actuarial cost method for calculating liabilities from the Projected Unit Credit cost method to the Entry Age Normal cost method.

The statutory contribution policy could also be strengthened by changing to an ADC based funding approach with an appropriate amortization policy for each respective tiered benefit structure.

At the April 21, 2015, Board meeting, the Board adopted a policy, for purposes of financial reporting under GASB Statement Nos. 67 and 68, which provides for the annual payment of SERS' normal cost and amortizing the unfunded liability over a 25-year closed-period, beginning July 1, 2015, as a level percent of capped payroll.

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 or death). The number of active members has decreased by about 7.00 percent between 2008 and 2018, which is an average annualized decrease of about 0.7 percent.

Currently, the actuarial valuation assumes that the total number of active members in the future will be equal to the number active in the current actuarial valuation. Given the decrease in the number of active members over the past ten years, if SERS 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.

Active Membership				
Fiscal Year Ending June 30,	Total	Annual Change in Membership	% Annual Change in Membership	Covered Payroll ($ in Millions)
2008	66,237			$3,967.70
2009	65,599	(638)	-0.96%	4,027.26
2010	64,143	(1,456)	-2.22%	4,119.36
2011	66,363	2,220	3.46%	4,211.19
2012	62,729	(3,634)	-5.48%	4,329.08
2013	61,545	(1,184)	-1.89%	4,236.19
2014	62,844	1,299	2.11%	4,416.15
2015	63,273	429	0.68%	4,453.68
2016	61,317	(1,956)	-3.09%	4,284.36
2017	60,612	(705)	-1.15%	4,195.78
2018	61,397	785	1.30%	4,243.74
Total Change		**(4,840)**	**-0.72%**	

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 7.00 percent on the actuarial value of assets), it is expected that:

1. The State contribution rate will be level as a percentage of payroll through 2045 (after all deferred asset gains and losses are fully recognized);
2. The unfunded liability will increase in dollar amount through 2028 before it begins to decrease;
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 percent 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 an 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 funding 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 percent is not synonymous with no required future contributions. If the funded status were 100 percent, 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.

Risk Associated with Measuring the Accrued Liability and Contributions

The determination of the accrued liability and the statutory contribution requires the use of actuarial 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 actuarial 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 total required employer 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 Fund'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 Fund'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 Fund's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
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; and
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.

The statutory contribution for fiscal year 2020 shown on page 8 should be considered as the minimum contribution that complies with the funding policy governed by State statute. The timely receipt of the statutory contribution is critical to support the financial health of the System. Users of this report

should be aware that contributions made at the statutorily determined amount 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:

	2018	2017
Ratio of the Market Value of Assets to Covered Payroll	4.12	3.94
Ratio of Actuarial Accrued Liability to Covered Payroll	11.29	11.13
Ratio of Actives to Retirees and Beneficiaries	0.84	0.84
Ratio of Net Cash Flow to Market Value of Assets	-1.85%	-1.94%

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 4.0 times the payroll, a return on assets 5 percent different than assumed would equal 20 percent 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 percent 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 11 times the payroll, a change in liability 2 percent other than assumed would equal 22 percent 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.

Risk Associated with Measuring the Accrued Liability and Contributions

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.

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. At the Board's request, we conducted additional risk assessment of investment and contribution risk through stress testing the investment return assumption and future active population growth.

SECTION B

FUNDING RESULTS

Table 1
Results of Actuarial Valuation as of June 30, 2018

1	Number of Members	
	a. Active	61,397
	b. Inactive:	
	i. Eligible for deferred vested pension benefits (3,505 based on SERS service alone. An additional 420 are eligible when reciprocal service is added to SERS service).	3,925
	ii. Eligible for return of contributions only	20,817
	c. Current Benefit Recipients:	
	i. Retirement annuities	59,749
	ii. Survivor annuities	11,344
	iii. Disability annuities	2,086
	d. Eligible for Deferred Benefits:	
	i. Retirement annuities	61
	ii. Survivor annuities	140
	e. Total	159,519
2	Covered Payroll Provided by System	$ 4,243,741,707
3	Annualized Benefit Payments Currently Being Made	
	a. Retirement (Includes those eligible for deferred benefits)	$ 2,283,947,054
	b. Survivor (Includes those eligible for deferred benefits)	159,503,423
	c. Disability	55,350,641
	d. Total	$ 2,498,801,118
4	Actuarial Liability—Annuitants	
	a. Current Benefit Recipients:	
	i. Retirement annuities	$ 31,269,280,905
	ii. Survivor annuities	1,743,964,994
	iii. Disability annuities	540,719,516
	b. Eligible for Deferred Benefits:	
	i. Retirement annuities	6,459,891
	ii. Survivor annuities	9,562,262
	c. Total	$ 33,569,987,568

Table 1 (continued)
Results of Actuarial Valuation as of June 30, 2018

5	Actuarial Liability—Inactive Members		
	a. Eligible for Deferred Vested Pension Benefits		$ 698,783,649
	b. Eligible for Return of Contributions Only		44,938,026
	c. Total		$ 743,721,675

		Normal Cost	Actuarial Liability
6	Active Members		
	a. Pension Benefits	$ 535,411,505	$ 9,271,238,377
	b. Cost-of-Living Adjustments	204,092,925	3,903,349,610
	c. Death Benefits		
	i. Occupational	$ 1,017,626	$ 10,409,553
	ii. Non-occupational	7,826,019	95,517,967
	iii. Refund	10,443,217	34,651,163
	iv. Total	$ 19,286,862	$ 140,578,683
	d. Disability		
	i. Occupational	$ 10,661,360	$ -
	ii. Non-occupational	60,414,374	-
	iii. Total	$ 71,075,734	$ -
	e. Withdrawal	28,342,736	296,806,880
	f. Expenses	17,716,979	-
	g. Total	$ 875,926,741	$ 13,611,973,550

7	Total Actuarial Liability (4 + 5 + 6)		$ 47,925,682,793
8	Market Value of Assets (MVA)		$ 17,463,278,241
9	Unfunded Actuarial Liability Based on MVA (7 – 8)		$ 30,462,404,552
10	Funded Percentage Based on MVA (8 ÷ 7)[a]		36.44%
11	Actuarial Value of Assets (AVA)		$ 17,478,139,578
12	Unfunded Actuarial Liability Based on AVA (7 – 11)		$ 30,447,543,215
13	Funded Percentage Based on AVA (11 ÷ 7) [a]		36.47%
14	Total Normal Cost	$ 875,926,741	
15	Employee Contributions	$ 243,122,845	
16	Annual Employer Normal Cost	$ 632,803,896	
	(% covered payroll provided by the System)	14.91%	

[a] *The funded status measure is appropriate for assessing the need for future contributions. The funded status is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.*

Table 2
Analysis of Change in Unfunded Accrued Actuarial Liability

In addition to the expected change in the unfunded accrued actuarial liability, changes in membership demographics and fund assets have affected the actuarial valuation results. The increase in the unfunded actuarial accrued liability (UAAL) of $305,068,480 was due to the following:

1	UAAL at 06/30/2017	$ 30,142,474,735
2	Contributions	
	a. Contributions due (Normal Cost plus Interest on UAAL)	
	i interest on 1)	$ 2,109,973,231
	ii members contributions	254,442,466
	iii employer normal cost	668,709,844
	iv interest on ii and iii	31,763,865
	v total due	$ 3,064,889,406
	b. Contributions paid (Actual)	
	i member contributions	$ 254,442,466
	ii state agencies	1,929,175,044
	iii interest on i and ii	75,134,006
	iv total paid	$ 2,258,751,516
	c. Expected increase in UAAL	$ 806,137,890
3	Expected UAAL at 06/30/2018	$ 30,948,612,625
4	(Gains)/Losses	
	a. investment income	$ (95,232,463)
	b. salary increases	(287,352,188)
	c. demographic	95,471,795
	d. total	$ (287,112,856)
5	Plan Provision Changes	$ -
6	Assumption Changes	$ (213,956,554)
7	Total Change in UAAL	$ 305,068,480
8	UAAL at 06/30/2018	$ 30,447,543,215

Table 3
Analysis of Financial Gains and Losses in Unfunded Accrued Actuarial Liability for Fiscal Year Ended June 30, 2018

	Activity		(Gain)/Loss	% of 06/30/2017 AAL
1	Actuarial (Gain)/Loss			
	a. Retirements	$	162,023,831	0.36%
	b. Incidence of Disability		(431,471)	0.00%
	c. In-Service Mortality		(96,507)	0.00%
	d. Retiree Mortality and Benefit Changes		(133,163,112)	-0.29%
	e. Salary Increases		(287,352,188)	-0.62%
	f. Terminations		(77,891,938)	-0.17%
	g. Investment		(95,232,463)	-0.20%
	h. New Entrant Liability		67,391,716	0.14%
	i. Other		77,639,276	0.17%
	j. Total Actuarial (Gain)/Loss	$	(287,112,856)	-0.61%
2	Plan Provision Changes	$	-	0.00%
3	Assumption Changes	$	(213,956,554)	-0.46%
4	Contribution (Excess)/Shortfall [a]	$	806,137,890	1.73%
5	Total Financial (Gain)/Loss	$	305,068,480	0.66%

[a] *Represents the increase in the Unfunded Actuarial Accrued Liability due to actual contributions being less than the Normal Cost plus interest on the beginning of year Unfunded Actuarial Accrued Liability.*

Table 4a
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 94-004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOP Proceeds
Investment Return of 7.00% Each Year ($ in Millions)

Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Annual Normal Cost				State Contribution		Total Expenses
							Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	
2019	61,397	$ 49,507	$ 17,013	$ 32,494	34.37%	$ 4,308	$ 876	$ 243	$ 633	14.69%	$ 2,256	52.34%	$ 2,590
2020	61,397	51,056	18,138	32,918	35.53%	4,394	877	247	630	14.34%	2,419	55.06%	2,730
2021	61,397	52,569	19,324	33,246	36.76%	4,484	876	251	625	13.94%	2,536	56.55%	2,868
2022	61,397	54,037	20,571	33,467	38.07%	4,572	872	255	618	13.51%	2,654	58.04%	3,011
2023	61,397	55,450	21,815	33,636	39.34%	4,662	866	258	608	13.04%	2,709	58.12%	3,157
2024	61,397	56,798	23,053	33,746	40.59%	4,753	858	262	596	12.54%	2,766	58.19%	3,308
2025	61,397	58,072	24,278	33,794	41.81%	4,846	849	266	583	12.04%	2,820	58.19%	3,461
2026	61,397	59,268	25,495	33,773	43.02%	4,945	840	269	570	11.54%	2,877	58.19%	3,614
2027	61,397	60,383	26,708	33,675	44.23%	5,048	831	274	557	11.04%	2,938	58.19%	3,764
2028	61,397	61,420	27,925	33,495	45.47%	5,156	825	278	547	10.61%	3,000	58.19%	3,909
2029	61,397	62,386	29,164	33,222	46.75%	5,274	822	283	539	10.22%	3,069	58.19%	4,044
2030	61,397	63,277	30,428	32,849	48.09%	5,398	821	288	532	9.86%	3,141	58.19%	4,181
2031	61,397	64,092	31,727	32,365	49.50%	5,528	821	294	526	9.52%	3,217	58.19%	4,314
2032	61,397	64,830	33,070	31,760	51.01%	5,663	820	300	520	9.18%	3,295	58.19%	4,445
2033	61,397	65,491	34,467	31,024	52.63%	5,801	821	306	515	8.88%	3,376	58.19%	4,569

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4a (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOP Proceeds
Investment Return of 7.00% Each Year ($ in Millions)

							Annual Normal Cost				State Contribution		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	Total Expenses
2034	61,397	$ 66,079	$ 35,935	$ 30,144	54.38%	$ 5,947	$ 824	$ 313	$ 511	8.60%	$ 3,461	58.19%	$ 4,687
2035	61,397	66,595	37,487	29,108	56.29%	6,099	827	320	507	8.32%	3,549	58.19%	4,800
2036	61,397	67,037	39,135	27,902	58.38%	6,253	829	326	503	8.05%	3,639	58.19%	4,909
2037	61,397	67,411	40,898	26,513	60.67%	6,413	835	333	501	7.82%	3,732	58.19%	5,009
2038	61,397	67,726	42,799	24,927	63.19%	6,580	842	341	502	7.63%	3,829	58.19%	5,100
2039	61,397	67,990	44,861	23,129	65.98%	6,754	853	348	505	7.48%	3,931	58.19%	5,181
2040	61,397	68,214	47,113	21,101	69.07%	6,936	868	356	511	7.37%	4,036	58.19%	5,252
2041	61,397	68,407	49,578	18,829	72.48%	7,122	884	365	519	7.29%	4,144	58.19%	5,314
2042	61,397	68,579	52,286	16,293	76.24%	7,312	903	374	530	7.24%	4,255	58.19%	5,367
2043	61,397	68,738	55,264	13,474	80.40%	7,508	925	383	542	7.22%	4,369	58.19%	5,412
2044	61,397	68,893	58,540	10,353	84.97%	7,706	947	392	555	7.21%	4,485	58.19%	5,449
2045	61,397	69,049	62,142	6,908	90.00%	7,907	971	401	570	7.21%	4,601	58.19%	5,482

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4b
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Investment Return of 7.00% Each Year ($ in Millions)

							Annual Normal Cost				Required State Contribution						
											(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2019	61,397	$ 49,507	$ 18,483	$ 31,024	37.33%	$ 4,308	$ 876	$ 243	$ 633	14.69%	$ 2,256	$ 120	$ 2,136	$ 2,266	$ 2,136	49.59%	$ 2,590
2020	61,397	51,056	19,579	31,477	38.35%	4,394	877	247	630	14.34%	2,419	128	2,291	2,430	2,291	52.15%	2,730
2021	61,397	52,569	20,725	31,844	39.42%	4,484	876	251	625	13.94%	2,536	135	2,400	2,546	2,400	53.53%	2,868
2022	61,397	54,037	21,924	32,114	40.57%	4,572	872	255	618	13.51%	2,654	142	2,512	2,665	2,512	54.93%	3,011
2023	61,397	55,450	23,109	32,341	41.67%	4,662	866	258	608	13.04%	2,709	148	2,561	2,721	2,561	54.93%	3,157
2024	61,397	56,798	24,273	32,525	42.74%	4,753	858	262	596	12.54%	2,766	159	2,607	2,778	2,607	54.85%	3,308
2025	61,397	58,072	25,409	32,663	43.75%	4,846	849	266	583	12.04%	2,820	169	2,651	2,832	2,651	54.71%	3,461
2026	61,397	59,268	26,526	32,742	44.76%	4,945	840	269	570	11.54%	2,877	173	2,704	2,889	2,704	54.69%	3,614
2027	61,397	60,383	27,628	32,756	45.75%	5,048	831	274	557	11.04%	2,938	177	2,760	2,950	2,760	54.68%	3,764
2028	61,397	61,420	28,717	32,703	46.76%	5,156	825	278	547	10.61%	3,000	185	2,815	3,013	2,815	54.60%	3,909
2029	61,397	62,386	29,812	32,574	47.79%	5,274	822	283	539	10.22%	3,069	193	2,876	3,082	2,876	54.54%	4,044
2030	61,397	63,277	30,910	32,367	48.85%	5,398	821	288	532	9.86%	3,141	204	2,937	3,154	2,937	54.41%	4,181
2031	61,397	64,092	32,021	32,072	49.96%	5,528	821	294	526	9.52%	3,217	215	3,002	3,230	3,002	54.31%	4,314
2032	61,397	64,830	33,156	31,673	51.14%	5,663	820	300	520	9.18%	3,295	220	3,076	3,309	3,076	54.31%	4,445
2033	61,397	65,491	34,333	31,157	52.42%	5,801	821	306	515	8.88%	3,376	219	3,157	3,390	3,157	54.42%	4,569

Normal cost rate includes administrative expenses.

State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.

Total expenses shown include benefit payments, refunds and administrative expenses.

Actuarial accrued liability and assets are measured at Plan Year End.

Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4b (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Investment Return of 7.00% Each Year ($ in Millions)

							Annual Normal Cost				Required State Contribution						
											(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2034	61,397	$ 66,079	$ 35,807	$ 30,272	54.19%	$ 5,947	$ 824	$ 313	$ 511	8.60%	$ 3,461	$ -	N/A	$ 3,475	$ 3,475	58.44%	$ 4,687
2035	61,397	66,595	37,365	29,229	56.11%	6,099	827	320	507	8.32%	3,549	-	N/A	3,564	3,564	58.44%	4,800
2036	61,397	67,037	39,021	28,016	58.21%	6,253	829	326	503	8.05%	3,639	-	N/A	3,654	3,654	58.44%	4,909
2037	61,397	67,411	40,792	26,619	60.51%	6,413	835	333	501	7.82%	3,732	-	N/A	3,747	3,747	58.44%	5,009
2038	61,397	67,726	42,702	25,024	63.05%	6,580	842	341	502	7.63%	3,829	-	N/A	3,845	3,845	58.44%	5,100
2039	61,397	67,990	44,775	23,216	65.85%	6,754	853	348	505	7.48%	3,931	-	N/A	3,947	3,947	58.44%	5,181
2040	61,397	68,214	47,037	21,177	68.96%	6,936	868	356	511	7.37%	4,036	-	N/A	4,053	4,053	58.44%	5,252
2041	61,397	68,407	49,516	18,891	72.38%	7,122	884	365	519	7.29%	4,144	-	N/A	4,162	4,162	58.44%	5,314
2042	61,397	68,579	52,237	16,341	76.17%	7,312	903	374	530	7.24%	4,255	-	N/A	4,273	4,273	58.44%	5,367
2043	61,397	68,738	55,230	13,507	80.35%	7,508	925	383	542	7.22%	4,369	-	N/A	4,387	4,387	58.44%	5,412
2044	61,397	68,893	58,524	10,369	84.95%	7,706	947	392	555	7.21%	4,485	-	N/A	4,503	4,503	58.44%	5,449
2045	61,397	69,049	62,145	6,905	90.00%	7,907	971	401	570	7.21%	4,601	-	N/A	4,621	4,621	58.44%	5,482

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4c
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 7.00% Each Year ($ in Millions)

Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Annual Normal Cost				State Contribution		Total Expenses
							Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	
2019	61,397	$ 49,507	$ 16,884	$ 32,623	34.10%	$ 4,308	$ 876	$ 243	$ 633	14.69%	$ 2,256	52.34%	$ 2,590
2020	61,397	51,056	17,947	33,108	35.15%	4,394	877	247	630	14.34%	2,419	55.06%	2,730
2021	61,397	52,569	19,303	33,267	36.72%	4,484	876	251	625	13.94%	2,545	56.76%	2,868
2022	61,397	54,037	20,584	33,454	38.09%	4,572	872	255	618	13.51%	2,667	58.33%	3,011
2023	61,397	55,450	21,829	33,621	39.37%	4,662	866	258	608	13.04%	2,710	58.13%	3,157
2024	61,397	56,798	23,067	33,731	40.61%	4,753	858	262	596	12.54%	2,765	58.17%	3,308
2025	61,397	58,072	24,293	33,779	41.83%	4,846	849	266	583	12.04%	2,819	58.17%	3,461
2026	61,397	59,268	25,510	33,758	43.04%	4,945	840	269	570	11.54%	2,876	58.17%	3,614
2027	61,397	60,383	26,723	33,660	44.26%	5,048	831	274	557	11.04%	2,937	58.17%	3,764
2028	61,397	61,420	27,940	33,480	45.49%	5,156	825	278	547	10.61%	2,999	58.17%	3,909
2029	61,397	62,386	29,179	33,207	46.77%	5,274	822	283	539	10.22%	3,068	58.17%	4,044
2030	61,397	63,277	30,442	32,835	48.11%	5,398	821	288	532	9.86%	3,140	58.17%	4,181
2031	61,397	64,092	31,741	32,351	49.52%	5,528	821	294	526	9.52%	3,216	58.17%	4,314
2032	61,397	64,830	33,083	31,746	51.03%	5,663	820	300	520	9.18%	3,294	58.17%	4,445
2033	61,397	65,491	34,480	31,010	52.65%	5,801	821	306	515	8.88%	3,375	58.17%	4,569

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4c (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 7.00% Each Year ($ in Millions)

							Annual Normal Cost				State Contribution		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	Total Expenses
2034	61,397	$ 66,079	$ 35,948	$ 30,131	54.40%	$ 5,947	$ 824	$ 313	$ 511	8.60%	$ 3,460	58.17%	$ 4,687
2035	61,397	66,595	37,500	29,095	56.31%	6,099	827	320	507	8.32%	3,548	58.17%	4,800
2036	61,397	67,037	39,147	27,890	58.40%	6,253	829	326	503	8.05%	3,637	58.17%	4,909
2037	61,397	67,411	40,910	26,502	60.69%	6,413	835	333	501	7.82%	3,730	58.17%	5,009
2038	61,397	67,726	42,810	24,916	63.21%	6,580	842	341	502	7.63%	3,828	58.17%	5,100
2039	61,397	67,990	44,871	23,119	66.00%	6,754	853	348	505	7.48%	3,929	58.17%	5,181
2040	61,397	68,214	47,122	21,092	69.08%	6,936	868	356	511	7.37%	4,035	58.17%	5,252
2041	61,397	68,407	49,587	18,820	72.49%	7,122	884	365	519	7.29%	4,143	58.17%	5,314
2042	61,397	68,579	52,293	16,286	76.25%	7,312	903	374	530	7.24%	4,254	58.17%	5,367
2043	61,397	68,738	55,270	13,468	80.41%	7,508	925	383	542	7.22%	4,367	58.17%	5,412
2044	61,397	68,893	58,544	10,349	84.98%	7,706	947	392	555	7.21%	4,483	58.17%	5,449
2045	61,397	69,049	62,145	6,904	90.00%	7,907	971	401	570	7.21%	4,600	58.17%	5,482

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4d
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Investment Return of 7.00% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

							Annual Normal Cost				Required State Contribution						
									Employer		(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2019	61,397	$ 49,507	$ 18,338	$ 31,169	37.04%	$ 4,308	$ 876	$ 243	$ 633	14.69%	$ 2,256	$ 120	$ 2,136	$ 2,266	$ 2,136	49.59%	$ 2,590
2020	61,397	51,056	19,363	31,693	37.93%	4,394	877	247	630	14.34%	2,419	128	2,291	2,430	2,291	52.15%	2,730
2021	61,397	52,569	20,695	31,875	39.37%	4,484	876	251	625	13.94%	2,545	135	2,410	2,559	2,410	53.75%	2,868
2022	61,397	54,037	21,929	32,109	40.58%	4,572	872	255	618	13.51%	2,667	142	2,525	2,683	2,525	55.23%	3,011
2023	61,397	55,450	23,115	32,336	41.69%	4,662	866	258	608	13.04%	2,710	148	2,562	2,723	2,562	54.95%	3,157
2024	61,397	56,798	24,278	32,520	42.74%	4,753	858	262	596	12.54%	2,765	159	2,606	2,778	2,606	54.82%	3,308
2025	61,397	58,072	25,414	32,658	43.76%	4,846	849	266	583	12.04%	2,819	169	2,650	2,832	2,650	54.68%	3,461
2026	61,397	59,268	26,530	32,738	44.76%	4,945	840	269	570	11.54%	2,876	173	2,703	2,890	2,703	54.67%	3,614
2027	61,397	60,383	27,631	32,753	45.76%	5,048	831	274	557	11.04%	2,937	177	2,759	2,950	2,759	54.66%	3,764
2028	61,397	61,420	28,719	32,701	46.76%	5,156	825	278	547	10.61%	2,999	185	2,814	3,013	2,814	54.57%	3,909
2029	61,397	62,386	29,813	32,573	47.79%	5,274	822	283	539	10.22%	3,068	193	2,875	3,082	2,875	54.51%	4,044
2030	61,397	63,277	30,910	32,367	48.85%	5,398	821	288	532	9.86%	3,140	204	2,935	3,154	2,935	54.39%	4,181
2031	61,397	64,092	32,019	32,073	49.96%	5,528	821	294	526	9.52%	3,216	215	3,001	3,231	3,001	54.29%	4,314
2032	61,397	64,830	33,154	31,676	51.14%	5,663	820	300	520	9.18%	3,294	220	3,074	3,309	3,074	54.29%	4,445
2033	61,397	65,491	34,329	31,161	52.42%	5,801	821	306	515	8.88%	3,375	219	3,156	3,391	3,156	54.40%	4,569

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4d (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Investment Return of 7.00% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

							Annual Normal Cost				Required State Contribution						
									Employer		(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2034	61,397	$ 66,079	$ 35,803	$ 30,276	54.18%	$ 5,947	$ 824	$ 313	$ 511	8.60%	$ 3,476	$ -	N/A	$ 3,476	$ 3,476	58.44%	$ 4,687
2035	61,397	66,595	37,362	29,233	56.10%	6,099	827	320	507	8.32%	3,564	-	N/A	3,564	3,564	58.44%	4,800
2036	61,397	67,037	39,017	28,020	58.20%	6,253	829	326	503	8.05%	3,654	-	N/A	3,654	3,654	58.44%	4,909
2037	61,397	67,411	40,788	26,623	60.51%	6,413	835	333	501	7.82%	3,748	-	N/A	3,748	3,748	58.44%	5,009
2038	61,397	67,726	42,699	25,028	63.05%	6,580	842	341	502	7.63%	3,846	-	N/A	3,846	3,846	58.44%	5,100
2039	61,397	67,990	44,771	23,219	65.85%	6,754	853	348	505	7.48%	3,947	-	N/A	3,947	3,947	58.44%	5,181
2040	61,397	68,214	47,034	21,180	68.95%	6,936	868	356	511	7.37%	4,054	-	N/A	4,054	4,054	58.44%	5,252
2041	61,397	68,407	49,513	18,894	72.38%	7,122	884	365	519	7.29%	4,162	-	N/A	4,162	4,162	58.44%	5,314
2042	61,397	68,579	52,235	16,344	76.17%	7,312	903	374	530	7.24%	4,274	-	N/A	4,274	4,274	58.44%	5,367
2043	61,397	68,738	55,228	13,510	80.35%	7,508	925	383	542	7.22%	4,388	-	N/A	4,388	4,388	58.44%	5,412
2044	61,397	68,893	58,522	10,371	84.95%	7,706	947	392	555	7.21%	4,504	-	N/A	4,504	4,504	58.44%	5,449
2045	61,397	69,049	62,143	6,906	90.00%	7,907	971	401	570	7.21%	4,621	-	N/A	4,621	4,621	58.44%	5,482

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

SECTION C

FUND ASSETS

Table 5
Statement of Fiduciary Net Position
for Years Ended June 30, 2018, and 2017

	2018	2017
Assets		
Cash	$ 204,856,059	$ 227,542,784
Receivables:		
Contributions:		
Participants	$ 16,945,386	$ 12,374,224
Employing state agencies	79,595,654	71,478,289
Other accounts	5,274,892	5,256,241
	$ 101,815,932	$ 89,108,754
Investments - held in the Illinois State Board of Investment Commingled Fund at fair value	$ 17,268,137,475	$ 16,322,605,337
Securities lending collateral with State Treasurer	66,204,000	63,393,000
Capital Assets, net of accumulated depreciation	$ 8,662,595	$ 7,701,569
Total Assets	$ 17,649,676,061	$ 16,710,351,444
Liabilities		
Benefits payable	$ 6,102,668	$ 7,036,045
Refunds payable	2,540,010	1,465,371
Administrative expenses payable	1,585,093	1,389,540
Participants' deferred service credit accounts	591,626	418,106
Due to State of Illinois	109,374,423	106,469,590
Securities lending collateral with State Treasurer	66,204,000	63,393,000
Total Liabilities	$ 186,397,820	$ 180,171,652
Net assets held in trust for pension benefits	$ 17,463,278,241	$ 16,530,179,792

Table 6
Statement of Changes in Fiduciary Net Position
for Years Ended June 30, 2018, and 2017

	2018	2017
Additions:		
Contributions:		
Participants	$ 254,442,466	$ 251,610,974
Employing state agencies and appropriations	1,929,175,044	1,798,348,440
Total Contributions revenue	$ 2,183,617,510	$ 2,049,959,414
Investments income:		
Net investments income	$ 352,866,811	$ 369,047,950
Interest earned on cash balances	1,507,697	1,327,756
Net appreciation in fair value of investments	902,665,327	1,442,502,754
Total Investments income	$ 1,257,039,835	$ 1,812,878,460
Total Additions	$ 3,440,657,345	$ 3,862,837,874
Deductions:		
Benefits:		
Retirement annuities	$ 2,240,156,641	$ 2,111,021,041
Survivors' annuities	144,671,705	136,359,106
Disability benefits	64,708,865	64,167,865
Lump-sum benefits	15,294,811	17,072,771
Total Benefits	$ 2,464,832,022	$ 2,328,620,783
Refunds	27,469,348	26,608,011
Administrative	15,257,526	15,957,439
Total Deductions	$ 2,507,558,896	$ 2,371,186,233
Net increase	$ 933,098,449	$ 1,491,651,641
Net assets held in trust for pension benefits:		
Beginning of year	$ 16,530,179,792	$ 15,038,528,151
End of year	$ 17,463,278,241	$ 16,530,179,792

Table 7
Development of the Actuarial Value of Assets — Actual Assets

Year Ending June 30	2018	2019	2020	2021	2022
Beginning of Year:					
(1) Market Value of Assets	$ 16,530,179,792				
(2) Actuarial Value of Assets	16,558,873,542				
End of Year:					
(3) Market Value of Assets	17,463,278,241				
(4) Contributions and Disbursements					
(4a) Actual State Contribution Amount	1,929,175,044				
(4b) Employee Contribution Amount	254,442,466				
(4c) Benefit Payouts & Refunds	(2,492,301,370)				
(4d) Administrative Expenses	(15,257,526)				
(4e) Net of Contributions and Disbursements	(323,941,386)				
(5) Total Investment Income =(3)-(1)-(4e)	1,257,039,835				
(6) Projected Rate of Return	7.00%				
(7) Projected Investment Income =(1)x(6)+([1+(6)]^.5-1)x(4e)	1,145,966,396				
(8) Investment Income in Excess of Projected Income	111,073,439				
(9) Excess Investment Income Recognized This Year (5-year recognition)					
(9a) From This Year	$ 22,214,688				
(9b) From One Year Ago	154,246,855	$ 22,214,688			
(9c) From Two Years Ago	(245,666,197)	154,246,855	$ 22,214,688		
(9d) From Three Years Ago	(75,128,261)	(245,666,197)	154,246,855	$ 22,214,688	
(9e) From Four Years Ago	241,573,941	(75,128,261)	(245,666,196)	154,246,856	$ 22,214,687
(9f) Total Recognized Investment Gain	97,241,026	(144,332,915)	(69,204,653)	176,461,544	22,214,687
(10) Change in Actuarial Value of Assets =(4e)+(7)+(9f)	$ 919,266,036				
End of Year:					
(3) Market Value of Assets	**$ 17,463,278,241**				
(11) Actuarial Value of Assets =(2)+(10)	**$ 17,478,139,578**				

Table 8
Development of the Actuarial Value of Assets — Hypothetical Assets

Year Ending June 30	2018	2019	2020	2021	2022
Beginning of Year:					
(1) Hypothetical Value of Assets	$ 15,043,590,209				
(2) Hypothetical Actuarial Value of Assets	15,067,525,595				
End of Year:					
(3) Hypothetical Value of Assets	15,981,348,628				
(4) Contributions and Disbursements					
(4a) State Contribution Amount [a]	2,043,430,143				
(4b) Employee Contribution Amount	254,442,466				
(4c) Benefit Payouts & Refunds	(2,492,301,370)				
(4d) Administrative Expenses	(15,257,526)				
(4e) Net of Contributions and Disbursements	(209,686,287)				
(5) Total Investment Income[b]					
=(3)-(1)-(4e)	1,147,444,706				
(6) Projected Rate of Return	7.00%				
(7) Projected Investment Income					
=(1)x(6)+([1+(6)]^.5-1)x(4e)	1,045,836,420				
(8) Investment Income in					
Excess of Projected Income	101,608,286				
(9) Excess Investment Income Recognized					
This Year (5-year recognition)					
(9a) From This Year	$ 20,321,657				
(9b) From One Year Ago	140,265,721	$ 20,321,657			
(9c) From Two Years Ago	(221,614,287)	140,265,721	$ 20,321,657		
(9d) From Three Years Ago	(67,410,944)	(221,614,287)	140,265,721	$ 20,321,657	
(9e) From Four Years Ago	214,666,479	(67,410,944)	(221,614,288)	140,265,722	$ 20,321,658
(9f) Total Recognized Investment Gain	86,228,626	(128,437,853)	(61,026,910)	160,587,379	20,321,658
(10) Change in Hypothetical Actuarial Value of Assets					
=(4e)+(7)+(9f)	$ 922,378,759				
End of Year:					
(3) Hypothetical Market Value of Assets	**$ 15,981,348,628**				
(11) Hypothetical Actuarial Value of Assets					
=(2)+(10)	**$ 15,989,904,354**				

[a] Represents 48.152 percent of payroll for the basic contribution. This rate was determined as part of the June 30, 2016, valuation, and recertified pursuant to P.A. 100-0023, and is based upon the hypothetical asset value which assumes no infusion from the proceeds of the GOB sale that were deposited July 1, 2003.

[b] Investment income assumes hypothetical value of assets earns the Fund's actual rate of return for fiscal year 2018 of 7.68 percent.

SECTION D

PARTICIPANT DATA

Table 9
Active Age and Service Distribution as of June 30, 2018

Age Group	Years of Service									Total	Percentage of Total
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Up		
Under 20	133	12								**145**	
20-24	614	761	6							**1,381**	**2%**
25-29	608	3,126	682	2						**4,418**	**7%**
30-34	459	2,961	2,258	343	7					**6,028**	**10%**
35-39	403	2,138	1,906	1,284	671	33				**6,435**	**10%**
40-44	381	1,672	1,285	1,058	2,131	791	14			**7,332**	**12%**
45-49	463	1,594	1,267	1,021	2,102	2,163	881	35		**9,526**	**17%**
50-54	483	1,372	1,006	901	1,572	1,674	1,649	790	32	**9,479**	**15%**
55-59	406	1,039	868	861	1,458	1,233	1,195	912	379	**8,351**	**14%**
60-64	231	594	686	623	995	690	527	492	502	**5,340**	**9%**
65-69	128	173	283	301	413	237	199	145	200	**2,079**	**3%**
70 & Over	66	57	98	114	179	104	95	57	113	**883**	**1%**
Total	**4,375**	**15,499**	**10,345**	**6,508**	**9,528**	**6,925**	**4,560**	**2,431**	**1,226**	**61,397**	**100%**
Percentage of Total	**7%**	**25%**	**17%**	**11%**	**16%**	**11%**	**7%**	**4%**	**2%**	**100%**	

Table 10
Retirees and Beneficiaries by Type of Benefit Being Paid as of June 30, 2018

Type of Benefit Being Paid	Count	Monthly Payment	Annual Payment	Average Annual Payment
Retirement Annuity	59,749	$ 190,298,060.83	$ 2,283,576,729.96	$ 38,219.50
Survivors	10,372	12,003,718.92	144,044,627.04	13,887.84
Widows	34	39,769.07	477,228.84	14,036.14
Occupational Death	51	66,478.78	797,745.36	15,642.07
QILDRO	865	1,102,029.16	13,224,349.92	15,288.27
Reversionary Annuity	22	54,047.01	648,564.12	29,480.19
Non-Occupational Disability	1,075	2,343,342.78	28,120,113.36	26,158.24
Occupational Disability	601	1,759,026.14	21,108,313.68	35,121.99
Temporary Disability	312	274,835.98	3,298,031.76	10,570.61
Total Temporary Disability - Occupational	98	235,348.45	2,824,181.40	28,818.18
Eligible for Deferred Retirement Annuity	61	30,860.36	370,324.32	6,070.89
Eligible for Deferred Survivor Annuity	140	25,909.01	310,908.12	2,220.77
Total	**73,380**	**$ 208,233,426.49**	**$ 2,498,801,117.88**	**$ 34,052.89**

SECTION E

ACTUARIAL METHODS AND ASSUMPTIONS

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Actuarial Cost Method as Mandated by 40 ILCS 5/14-131, Adopted June 30, 1989

The projected unit credit normal cost method is used. Under this method, the projected pension at retirement age is first calculated and the present value at the individual member's current or attained age is determined. The normal cost for the member for the current year is equal to the actuarial present value divided by the member's projected service at retirement. The normal cost for the plan for the year is the sum of the individual normal costs.

The actuarial liability at any point in time is the present value of the projected pensions at that time less the present value of future normal costs.

For ancillary benefits for active members, in particular death and survivor benefits, termination benefits and the postretirement increases, the same procedure as outlined above is followed.

Estimated annual administrative expenses are added to the normal cost.

For actuarial valuation purposes, as well as projection purposes, an actuarial value of assets is used.

Most Actuarial Assumptions Adopted June 30, 2016

Actuarial assumptions are set by the Board of Trustees. The actuarial assumptions used for the June 30, 2018, actuarial valuation are based on a full experience review for the four-year period ended June 30, 2013, a modified experience review for the three-year period ended June 30, 2015, and the 2018 economic assumption review. All actuarial assumptions are expectations of future experience, not market measures.

Mortality

Post-Retirement Mortality

105 percent of the RP-2014 Healthy Annuitant mortality tables, sex distinct, with generational mortality improvements using the MP-2014 two-dimensional mortality improvement scales recently released by the Society of Actuaries. This assumption provides a margin for future mortality improvements. No adjustment is made for post-disabled mortality.

Pre-Retirement Mortality, including terminated vested members prior to attaining age 50

Based on a percentage of 75 percent for males and 90 percent for females of the RP-2014 Total Employee mortality table with generational mortality improvements using the MP-2014 two-dimensional mortality improvement scales, to reflect that experience shows active members having lower mortality rates than retirees of the same age. Five percent of deaths among active employees are assumed to be in the performance of their duty.

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Interest

7.00 percent per year, compounded annually, net of investment expenses.

General Inflation

2.50 percent per year, compounded annually.

This assumption serves as the basis for the determination of Tier Two annual increases that are equal to the lesser of 3.0 percent or one-half of the annual increase in the consumer price index-u during the preceding 12-month calendar year and are not compounded.

Marriage Assumption

85.0 percent of active male participants and 65.0 percent of active female participants are assumed to be married. Actual marital status at benefit commencement is used for retirees.

Social Security Offset for Survivor Benefits

No offset assumption for male surviving spouses because it is assumed their own PIA is as great as their spouses' PIA. Sixty percent of married male members are assumed to have a dual income household. For the dual income household, it is assumed the offset at age 60 is 45.0 percent of the original survivor benefit. It is assumed the offset at age 62 is 10.0 percent of the original survivor benefit. Furthermore, it is assumed that 50 percent of retirees on or after July 1, 2009, will elect to remove the offset provision. In exchange for the removal, the member's retirement annuity is reduced by 3.825 percent monthly as mandated by Statutes.

Termination

Illustrative rates of withdrawal from the plan are as follows for Tier One members:

Service Based Withdrawal				
	Regular Formula Employees		Alternate Formula Employees	
Service (Beginning of Year)	Males	Females	Males	Females
0	0.2300	0.2300	0.0325	0.0600
1	0.1200	0.1200	0.0325	0.0450
2	0.0950	0.0850	0.0325	0.0450
3	0.0700	0.0650	0.0200	0.0400
4	0.0625	0.0500	0.0175	0.0300
5	0.0425	0.0475	0.0175	0.0300
6	0.0425	0.0350	0.0175	0.0300
7	0.0350	0.0350	0.0175	0.0200
8	0.0300	0.0300	0.0150	0.0200
9	0.0250	0.0250	0.0150	0.0200
10	0.0250	0.0250	0.0150	0.0200
11	0.0200	0.0200	0.0125	0.0175
12	0.0200	0.0200	0.0125	0.0175
13	0.0200	0.0200	0.0100	0.0150
14	0.0150	0.0150	0.0100	0.0150
15	0.0150	0.0150	0.0100	0.0150
16	0.0150	0.0150	0.0100	0.0150
17	0.0150	0.0150	0.0100	0.0150
18	0.0150	0.0150	0.0100	0.0150
19	0.0150	0.0150	0.0100	0.0150
20	0.0150	0.0100	0.0100	0.0150
21	0.0150	0.0100	0.0100	0.0150
22	0.0150	0.0100	0.0100	0.0150
23	0.0150	0.0100	0.0100	0.0150
24	0.0150	0.0100	0.0100	0.0150
25	0.0150	0.0100	0.0100	0.0150
26	0.0150	0.0100	0.0100	0.0150
27	0.0150	0.0100	0.0100	0.0150
28	0.0150	0.0100	0.0100	0.0150
29	0.0150	0.0100	0.0100	0.0150
30+	0.0150	0.0100	0.0100	0.0150

It is assumed that terminated employees will not be rehired. The rates apply only to employees who have not fulfilled the service requirement necessary for retirement at any given age.

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Salary Increases

Illustrative rates of increase per individual employee per year, compounded annually:

Age	Annual Increase
25	7.42%
30	5.95%
35	5.05%
40	4.72%
45	4.33%
50	4.01%
55	3.80%
60	3.60%
65	3.22%
70	3.00%

The underlying salary increase assumption is based on a wage inflation assumption of 3.00 percent per year, comprised of 2.50 percent for general inflation plus 0.50 percent for general merit and productivity increases.

Disability

Because members who receive disability benefits typically spend less than one year on disability, they are considered active members. Therefore a load of 1.65 percent of pay on the normal cost is applied to reflect the near-term cash flow. This assumption is based on 110 percent of the most recent disability benefit payment information as a percent of payroll and will be updated at each actuarial valuation date as experience emerges.

415(b) and 401(a)(17) Limits

No explicit assumption is made with respect to these items.

Accelerated Pension Benefit Payment Program Election Assumption

Zero percent 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 payment in accordance with Public Act 100-0587. Zero percent of eligible inactive members are assumed to elect to receive an accelerated pension benefit payment in lieu of an annuity at retirement in accordance with Public Act 100-0587.

Actuarial Methods and Assumptions
(Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Population Projection

For purposes of determining annual appropriation as a percent of total covered payroll, the size of the active group is assumed to remain level at the number of actives as of the actuarial valuation date. New entrants are assumed to enter with an average age and an average pay as disclosed below. New entrants are assumed to have the same demographic profile as new entrants in the 15 years prior to the actuarial valuation date. The average increase in uncapped payroll for the projection period is 3.00 percent per year. New entrants not covered by Social Security are assumed to participate in the Tier 2 defined benefit plan.

New Entrant Benefit Groups																
Age Group	New Entrants Eligible for Regular Formula Benefits who are Covered by Social Security		New Entrants Eligible for Regular Formula Benefits who are not Covered by Social Security		New Entrants in Positions Formerly Eligible for Alternate Formula Benefits who are Covered by Social Security and are now Eligible for Regular Formula Benefits		New Entrants Eligible for Alternate Formula Benefits who are Covered by Social Security		New Entrants in Positions Formerly Eligible for Alternate Formula Benefits who are not Covered by Social Security and are now Eligible for Regular Formula Benefits		New Entrants Eligible for Alternate Formula Benefits who are not Covered by Social Security		Total	
	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
Under 20	101	3,273,076			56	2,425,780	22	978,753					179	6,677,609
20-24	2,286	86,829,284	10	418,906	1,423	63,650,527	491	22,438,208	289	18,562,326	5	169,062	4,504	192,068,313
25-29	4,041	177,773,635	25	1,297,493	1,656	77,279,917	595	29,241,086	428	28,564,422	4	120,065	6,749	314,276,618
30-34	3,524	169,882,758	14	837,406	912	45,057,917	436	23,439,515	179	12,477,619			5,065	251,695,215
35-39	3,055	156,381,078	6	283,250	569	29,566,514	357	19,986,299	73	5,283,936	1	57,836	4,061	211,558,913
40-44	2,949	154,235,971	7	392,812	475	26,765,580	247	14,608,427	29	2,038,070			3,707	198,040,860
45-49	2,562	136,201,912	7	429,992	367	20,777,405	222	13,610,301	11	710,889			3,169	171,730,499
50-54	2,111	114,617,227	8	545,402	218	12,704,620	111	6,962,010	10	754,393			2,458	135,583,652
55-59	1,306	67,398,379	7	499,479	125	7,268,553	60	3,395,667	10	791,970			1,508	79,354,048
60-64	485	25,340,644			33	2,187,453	14	969,273	3	252,896			535	28,750,266
65-69	34	1,848,921			4	236,547							38	2,085,468
70 & Over														
Total	22,454	$ 1,093,782,885	84	$ 4,704,740	5,838	$ 287,920,813	2,555	$ 135,629,539	1,032	$ 69,436,521	10	$ 346,963	31,973	$ 1,591,821,461
Avg. Salary		$ 48,712		$ 56,009		$ 49,318		$ 53,084		$ 67,283		$ 34,696		$ 49,786
Avg. Age		37.75		35.76		31.72		33.31		28.55		25.49		35.99
Percent Male		43%		94%		75%		71%		89%		100%		52%

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Retirement

Employees are assumed to retire in accordance with the rates shown below. The rates apply only to employees who have fulfilled the service requirement necessary for retirement at any given age.

Retirement Rates for Regular Formula Employees		
Age	Males	Females
50	15.00%	25.00%
51	15.00%	25.00%
52	25.00%	30.00%
53	25.00%	25.00%
54	20.00%	20.00%
55	17.50%	16.00%
56	17.50%	16.00%
57	15.00%	16.00%
58	15.00%	16.00%
59	15.00%	16.00%
60	10.00%	16.00%
61	10.00%	12.50%
62	20.00%	20.00%
63	17.50%	17.50%
64	15.00%	17.50%
65	20.00%	25.00%
66	25.00%	20.00%
67	20.00%	20.00%
68	20.00%	20.00%
69	17.50%	20.00%
70	17.50%	20.00%
71	17.50%	15.00%
72	15.00%	20.00%
73	17.50%	20.00%
74	20.00%	20.00%
75	100.00%	100.00%

Early Retirement Rates for Regular Formula Employees		
Age	Males	Females
55	4.50%	4.50%
56	6.00%	4.00%
57	5.00%	7.00%
58	7.50%	9.50%
59	9.50%	12.00%

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Retirement Rates for Alternate Formula Employees				
	Eligible for Alternate Formula Benefits Only		Eligible for Regular Formula Benefits Only	
Age	Males	Females	Males	Females
50	60.00%	40.00%	N/A	N/A
51	45.00%	40.00%	N/A	N/A
52	45.00%	35.00%	N/A	N/A
53	40.00%	30.00%	N/A	N/A
54	40.00%	25.00%	N/A	N/A
55	35.00%	30.00%	N/A	N/A
56	35.00%	25.00%	N/A	N/A
57	27.50%	20.00%	N/A	N/A
58	30.00%	20.00%	N/A	N/A
59	25.00%	25.00%	N/A	N/A
60	30.00%	30.00%	5.00%	8.00%
61	25.00%	20.00%	5.00%	8.00%
62	45.00%	45.00%	10.00%	8.00%
63	40.00%	35.00%	10.00%	12.50%
64	30.00%	40.00%	10.00%	12.50%
65	55.00%	40.00%	20.00%	17.50%
66	50.00%	60.00%	20.00%	15.00%
67	50.00%	50.00%	20.00%	40.00%
68	30.00%	15.00%	17.50%	30.00%
69	35.00%	35.00%	17.50%	20.00%
70	50.00%	60.00%	17.50%	25.00%
71	30.00%	50.00%	17.50%	30.00%
72	100.00%	100.00%	100.00%	100.00%

Assets

Assets available for benefits are determined as described on page 49. The asset valuation method is prescribed by statute, and does not appear to allow a corridor; therefore, a corridor has not been established.

Expenses

As estimated and advised by SERS staff, based on current expenses and are expected to increase in relation to the projected capped payroll.

Spouse's Age

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

Children

It is assumed that married members have 2.2 children, one year apart in age.

The age of the youngest child of a deceased employee at his date of death is assumed to be as follows:

Age at Death of Employee	Age of Youngest Child	Age at Death of Employee	Age of Youngest Child
20	2	40	6
25	3	45	8
30	4	50	10
35	5	55	12
		60	14

Overtime and Shift Differentials

Reported earnings include base pay alone. It is assumed that overtime and shift differentials will increase total payroll by 3.5 percent over reported earnings.

Load for Inactive Members Eligible for Deferred Vested Pension Benefits

Load of 15 percent to the liability attributable to inactive members eligible for deferred vested pension benefits for increase in final average salary due to participation in a reciprocal system after termination.

Unused Sick Leave and Optional Service Purchases

Current and future active member's service is increased 4.5 months to account for increases of service at retirement due to converting unused sick leave and vacation days and purchasing applicable optional service.

Missing Data

If year-to-date earnings were not available, then the monthly pay rate is used. If both year-to-date earnings and the monthly pay rate are not available, the annual rate of pay is assumed to be the rate of pay for the population as a whole on the actuarial valuation date. For members with less than a year of service, the annual rate of pay is based on the greater of year-to-date earnings or annualized pay rate. If a birth date was not available, the member was assumed to be age 35.

Decrement Timing

All decrements are assumed to occur mid-year.

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Decrement Relativity

Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

Decrement Operation

Disability and turnover decrements do not operate after a member reaches retirement eligibility.

Eligibility Testing

Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.

Assumptions as a Result of Public Act 96-0889 Adopted June 30, 2016

Members hired after December 31, 2010, are assumed to make contributions on salary up to the final average compensation cap in a given year until this plan provision or administrative procedure is clarified.

State contributions, expressed as a percentage of pay, are calculated based upon capped pay.

Members hired after December 31, 2010, eligible for the regular formula benefits will retire according to the following age-based retirement rates:

Retirement Rates for Regular Formula Employees			
Age	Employees Eligible For Normal Retirement	Age	Employees Eligible For Early Retirement
67	50.00%	62	30.00%
68	35.00%	63	15.00%
69	35.00%	64	15.00%
70	35.00%	65	15.00%
71	20.00%	66	15.00%
72	20.00%		
73	20.00%		
74	20.00%		
75	100.00%		

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Members hired after December 31, 2010, eligible for the alternate formula benefits will retire according to the following age-based retirement rates:

Retirement Rates for Alternate Formula Employees		
Age	Males	Females
60	50.00%	50.00%
61	25.00%	20.00%
62	45.00%	45.00%
63	40.00%	35.00%
64	30.00%	40.00%
65	55.00%	40.00%
66	50.00%	60.00%
67	50.00%	50.00%
68	30.00%	15.00%
69	35.00%	35.00%
70	50.00%	60.00%
71	30.00%	50.00%
72	100.00%	100.00%

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2016, Actuarial Valuation)

Illustrative rates of withdrawal from the plan are as follows for members hired after December 31, 2010:

Service Based Withdrawal				
	Regular Formula Employees		Alternate Formula Employees	
Service (Beginning of Year)	Males	Females	Males	Females
0	0.2700	0.2500	0.0500	0.0775
1	0.1400	0.1600	0.0350	0.0475
2	0.0800	0.1000	0.0350	0.0475
3	0.0800	0.0800	0.0225	0.0425
4	0.0625	0.0700	0.0200	0.0325
5	0.0500	0.0600	0.0200	0.0325
6	0.0450	0.0550	0.0200	0.0325
7	0.0400	0.0500	0.0200	0.0225
8	0.0350	0.0450	0.0175	0.0225
9	0.0300	0.0400	0.0175	0.0225
10	0.0250	0.0350	0.0175	0.0225
11	0.0200	0.0250	0.0150	0.0200
12	0.0200	0.0200	0.0150	0.0200
13	0.0200	0.0200	0.0125	0.0175
14	0.0150	0.0150	0.0125	0.0175
15	0.0150	0.0150	0.0100	0.0150
16	0.0150	0.0150	0.0100	0.0150
17	0.0150	0.0150	0.0100	0.0150
18	0.0150	0.0150	0.0100	0.0150
19	0.0150	0.0150	0.0100	0.0150
20	0.0150	0.0150	0.0100	0.0150
21	0.0150	0.0150	0.0100	0.0150
22	0.0150	0.0150	0.0100	0.0150
23	0.0150	0.0150	0.0100	0.0150
24	0.0150	0.0150	0.0100	0.0150
25	0.0150	0.0150	0.0100	0.0150
26	0.0150	0.0150	0.0100	0.0150
27	0.0150	0.0150	0.0100	0.0150
28	0.0150	0.0150	0.0100	0.0150
29	0.0150	0.0150	0.0100	0.0150
30+	0.0150	0.0150	0.0100	0.0150

Projection Methodology and Appropriation Requirements under P.A. 93-0002, P.A. 94-0004, P.A. 96-0043 and P.A. 100-0023

State Contributions under P.A. 93-0002

In general, for each year during the life of the GOB program, the state contributions to the System are to be calculated as follows:

1. Calculation of the contribution maximum
    a. A projection of contributions will be made from the actuarial valuation date to June 30, 2045. Such projection will be based on hypothetical asset values determined using the following assumptions:
        i) That the System had received no portion of the general obligation bond proceeds in excess of the scheduled contributions for the remainder of fiscal 2003 and for the entirety of 2004,
        ii) That hypothetical state contributions had been made each fiscal year from 2005 through the actuarial valuation date, based on the funding process in place prior to P.A. 93-0002 (without regard to prior state minimum requirements),
        iii) That the actual amounts of member contributions and the actual cash outflows (benefit payments, refunds and administrative expenses) for each year prior to the actuarial valuation date were realized, and
        iv) That the hypothetical fund earned returns in each prior fiscal year equal to the rate of total return actually earned by the retirement fund in that year.
    b. The hypothetical asset values developed in a., above, will not exceed the actual assets of the fund.
    c. A projection of maximum contributions for each year of the GOB program will be performed each year, by reducing the contributions produced in a., above, by the respective amount of debt service allocated to the System for each year.
2. Calculation of the contribution with GOB proceeds
    a. The basic projection of state contributions from the actuarial valuation date through June 30, 2045, will be made, taking into account all assets of the System, including the GOB proceeds.
    b. State contribution rates (expressed as a percentage of covered pay), in the pattern required by the funding sections of the statutes, are calculated.
    c. In those projections, the dollars of state contributions which are added to assets each year during the GOB program are limited by the contribution maximum. Because the bonds are to be liquidated by the end of fiscal 2033, there is no contribution maximum thereafter.

Projection Methodology and Appropriation Requirements under P.A. 93-0002, P.A. 94-0004, P.A. 96-0043 and P.A. 100-0023

State Contributions under P.A. 94-0004

The following is an excerpt from the Illinois Compiled statutes 40 ILCS 5/14-108.3 (f)-(g):

> (f) The System shall determine the amount of the increase in the present value of future benefits resulting from the granting of early retirement incentives under this Section and shall report that amount to the Governor and the Commission on Government Forecasting and Accountability on or after the effective date of this amendatory Act of the 93rd General Assembly and on or before November 15, 2004. Beginning with State fiscal year 2008, the increase reported under this subsection (f) shall be included in the calculation of the required State contribution under Section 14-131.
>
> (g) In addition to the contributions otherwise required under this Article, the State shall appropriate and pay to the System an amount equal to $70,000,000 in State fiscal years 2004 and 2005.

State Contributions under P.A. 96-0043

The following is an excerpt from the Illinois Compiled statutes 40 ILCS 5/14-131:

> (g) For purposes of determining the required State contribution to the System, the value of the System's assets shall be equal to the actuarial value of the System's assets, which shall be calculated as follows:
>
> > As of June 30, 2008, the actuarial value of the System's assets shall be equal to the market value of the assets as of that date. In determining the actuarial value of the System's assets for fiscal years after June 30, 2008, any actuarial gains or losses from investment return incurred in a fiscal year shall be recognized in equal annual amounts over the five-year period following that fiscal year.
>
> (h) For purposes of determining the required State contribution to the System for a particular year, the actuarial value of assets shall be assumed to earn a rate of return equal to the System's actuarially assumed rate of return.

Projection Methodology and Appropriation Requirements under P.A. 93-0002, P.A. 94-0004, P.A. 96-0043 and P.A. 100-0023

State Contributions under P.A. 100-0023

Public Act ("P.A.") 100-0023, effective July 6, 2017, modified the State's funding policy to include smoothing State contribution rate increases or decreases due to changes in actuarial assumptions, including investment return assumptions, over a five-year period in equal annual amounts beginning in fiscal year 2018. In addition, changes in actuarial or investment assumptions that increased or decreased the State contribution rate in fiscal years 2014 through 2017 are to be smoothed over a five-year period in equal annual amounts, applying only to the portion of the five-year phase-in that is applicable to fiscal years on and after 2018.

Following the preceding legislation we have calculated the required contribution and the results are shown in the summary section of this report.

Phase-in of the Financial Impact of Assumption Changes

Following 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, 2014, actuarial valuation, there were changes to the economic and demographic assumptions.
2. Beginning with the June 30, 2016, actuarial valuation, there were changes to the economic and demographic assumptions.
3. Beginning with the June 30, 2018, actuarial valuation, there were changes to the economic assumptions.

Valuation Year Ending June 30,	2014	2015	2016	2017	2018	2019	2020	2021	2022
Applicable Fiscal Year Ending June 30,	2016	2017	2018	2019	2020	2021	2022	2023	2024
					$ in Millions After Impact of GOB Proceeds				
Contribution Before Assumption Change									
(1) Contribution Dollar	$ 1,822.047	$ -	$ 2,018.671	$ -	$ 2,291.303				
(2) Contribution Rate	38.830%	0.000%	45.027%	0.000%	52.026%				
Contribution After Assumption Change									
(3) Contribution Dollar	$ 2,044.868	$ -	$ 2,327.633	$ -	$ 2,302.720				
(4) Contribution Rate	43.880%	0.000%	52.095%	0.000%	52.411%				
(5) Assumption Change Impact as a Percentage of Capped Payroll [(4) - (2)]	5.050%	0.000%	7.068%	0.000%	0.385%				
(6) Assumption Change Impact Recognized This Year (5-year Recognition)									
(6a) From This Year	1.010%	0.000%	1.414%	0.000%	0.077%				
(6b) From One Year Ago	0.000%	1.010%	0.000%	1.414%	0.000%	0.077%			
(6c) From Two Years Ago	0.000%	0.000%	1.010%	0.000%	1.414%	0.000%	0.077%		
(6d) From Three Years Ago	0.000%	0.000%	0.000%	1.010%	0.000%	1.414%	0.000%	0.077%	
(6e) From Four Years Ago	0.000%	0.000%	0.000%	0.000%	1.010%	0.000%	1.412%	0.000%	0.077%
(6f) Total Recognized Assumption Change Impact	1.010%	1.010%	2.424%	2.424%	2.501%	1.491%	1.489%	0.077%	0.077%

SECTION F

SUMMARY OF PLAN PROVISIONS

Summary of Plan Provisions
(as of June 30, 2018)

Purpose

The State Employees' Retirement System of Illinois, a State Agency, provides an orderly means whereby aged or disabled employees may be retired from active service without prejudice or hardship and enables the employees to accumulate reserves for old age, disability, death and termination of employment.

Administration

Responsibility for the operation of the System and the direction of its policies is vested in a Board of Trustees of seven members. The administration of the detailed affairs of the System is the responsibility of the Executive Secretary who is appointed by the Board of Trustees. Administrative policies and procedures are designed to ensure an accurate accounting of funds of the System and prompt payment of claims for benefits within the applicable statute.

Membership

All persons entering State service on or after January 1, 1984, become members upon completion of six months of continuous service except that, beginning July 1, 1991, employees in police positions become members on their first day of employment. Persons entering State service from January 1, 1972 to January 1, 1984, became members on their first day of employment. Excluded from membership are: any employee whose position is subject to membership under another State-supported system, any person who becomes an employee after June 30, 1979, as a public service employment program participant under the federal CETA program or any enrollee of the Young Adult Conservation Corps. Prior to January 1, 1984, emergency and temporary employees were excluded from membership. Persons appointed by the Governor with the advice and consent of the Senate may elect to become members of the System. Other exceptions are identified in State law.

Membership Service

Membership service includes all service rendered while a member of the System for which credit is allowable. Persons entering service on or after January 1, 1984, or after July 1, 1982, in the case of emergency or temporary employees, may also receive membership service credit for periods of employment prior to membership by making contributions for such periods.

Member Contributions

Members are required to contribute a percentage of salary as their share of meeting the cost of the various benefits. Contribution rates are as shown below:

- Members covered by Social Security – 4.0 percent of Salary.
- Members not covered by Social Security – 8.0 percent of Salary.
- Members covered by Social Security who are serving in a position in which service toward the Alternative Retirement Annuity may be earned – 8.5 percent of Salary.
- Members not covered by Social Security who are serving in a position in which service toward the Alternative Retirement Annuity may be earned – 12.5 percent of Salary.

Members covered by Social Security also pay the current Social Security tax rate.

Credit for regular interest each fiscal year on a member's individual contribution account is computed on the accumulated balance in the account at the beginning of each fiscal year.

Retirement Pension

Qualification of Member

Upon termination of State service, a member is eligible for a pension at age 60 with at least eight years of pension credit or at any age with 35 or more years of credit.

General formula members are eligible for a retirement annuity if the sum of the member's age plus years (and whole months) of pension credit equals or exceeds 85. General formula members between ages 55 and 60 with at least 25 years of pension credit are eligible for a retirement annuity reduced by one-half of 1 percent for each month the member is under age 60. Certain positions in the Department of Corrections were placed under the general formula effective July 1, 2005.

Members serving in a position in which service toward the Alternative Retirement Annuity may be earned are eligible to receive the alternative retirement annuity at age 50 with at least 25 years of pension credit or at age 55 with at least 20 years of pension credit in such a position. Security employees of the Department of Human Services were placed under the alternative formula effective

January 1, 2001. Certain members of the Department of Transportation and the Toll Highway Authority were placed under the alternative formula effective August 1, 2001.

Amount of Pension

The pension is based on the member's final average compensation and the number of years of pension credit that has been established.

Final Average Compensation is the average of the highest 48 consecutive months in the last 10 years. All employees whose benefit is calculated under the alternative formula will have their benefit based on the greater of (i) the salary rate in effect on their last day of service, provided the last day salary does not exceed 115 percent of the average monthly compensation received by the member for the last 24 months of service, or (ii) the average monthly compensation for the last 48 months prior to retirement.

The general formula for members retiring on or after January 1, 1998, (regardless of termination date) is as follows:

- 1.67 percent of final average salary per year of credited service for members covered by Social Security.
- 2.20 percent of final average salary per year of credited service for members not covered by Social Security.

The alternative formula for members retiring on or after January 1, 2001 (regardless of termination date) is as follows:

- 2.50 percent of final average salary per year of credited service for members covered by Social Security.
- 3.00 percent of final average salary per year of credited service for members not covered by Social Security.

The maximum pension payable is 75 percent of final average compensation for general formula members and 80 percent of final average compensation for alternative formula members.

Optional Forms of Payment

Reversionary Annuity—A member may elect to receive a smaller pension during his lifetime in order to provide a spouse or a designated dependent with a lifetime income. That payment would be in addition to any other benefit payable by the System.

Level Income—A member who contributes to Social Security as a State employee may elect to have his pension payments increased before Social Security Normal Retirement Age and reduced thereafter. To be eligible for this election the member must have established eligibility for a Social Security pension.

Annual Increases in Pension

Postretirement increases of 3.0 percent of the current pension (i.e., increases are compounded) are granted to members effective each January 1 occurring on or after the first anniversary of the pension.

Survivors Annuity

Qualification of Survivor

If death occurs while in State employment, the member must have established at least 18 months of pension credit. If death occurs after termination of State service and the member was not receiving a retirement pension, the member must have established at least eight years of pension credit.

An eligible spouse qualifies at age 50 or at any age if there is, in the care of the spouse, any unmarried children of the member under age 18 (age 22 if full-time student); unmarried children under age 18 (age 22 if full-time student) qualify if no spouse survives; dependent parents at age 50 qualify if neither an eligible spouse nor children survive the member.

Amount of Payment

If the member's death occurs before retirement, the named beneficiary receives a lump sum refund of all of the member's pension contributions plus interest, excluding contributions for widows and survivors benefits. A single lump sum payment of $1,000 is also made immediately to the survivor beneficiary of the member.

An eligible spouse receives a monthly annuity equal to 30 percent of the member's final average compensation subject to a maximum of $400. If children of the member are under the care of the spouse, the annuity is increased for each child, subject to a monthly maximum of $600 or 80 percent of final average compensation. If only eligible children survive, the monthly annuity may not exceed the lesser of $600 or 80 percent of final average compensation. The maximum combined monthly payment to parents may not exceed $400. If the member's death occurs after retirement or after termination of State employment but before the member receives a pension, the monthly benefit is further limited to 80 percent of the pension received or earned by the member. Monthly benefits payable to survivors of a member who was covered by Social Security as a State employee are reduced by one-half of the Social Security benefits for which the survivors are eligible. For benefits granted on or after January 1, 1992, the reduction may not exceed 50 percent of the amount of survivors annuity otherwise payable. If death of the member occurs on or after January 1, 1984, the minimum total survivors annuity benefit payable (before any reduction for Social Security benefits) is equal to 50 percent of the member's earned pension without regard to the member's age at death. Any member who retires on or after July 1, 2009, will have the option at the time of retirement to remove the offset provision. In exchange for the removal, SERS will reduce the member's retirement annuity by 3.825 percent.

Duration of Payment

The monthly annuity payable to a spouse continues for his/her lifetime without regard to remarriage. The monthly annuity to children terminates upon death, marriage or attainment of age 18 (age 22 if

full-time student). However, the monthly annuity will continue for a child who, at age 18, is physically or mentally disabled and unable to accept gainful employment.

Annual Increases in Annuity

If the member's death occurs before retirement, increases of 3.0 percent of the current annuity are granted to survivors effective each January 1 occurring on or after the first anniversary of the annuity (i.e., increases are compounded). If the member's death occurs after retirement, the initial 3.0 percent increase applies on the January 1 on or after the survivor annuity begins.

Widow's Annuity Option

The widow of a male member who was a participant in the System prior to July 19, 1961, may have the option of taking a Widow's Annuity rather than the Survivor's Annuity.

Qualification of Widow

An eligible widow receives a Widow's Annuity if she is age 50 or over or has in her care any of the member's unmarried children under age 18. If she is not age 50 and has no such children in her care, she becomes eligible at age 50.

Amount of Payment

The Widow's Annuity consists of a lump sum payment of $500, plus a monthly annuity equal to 50 percent of the pension earned or received by the member at the date of death. If the widow has in her care eligible children of the member, the monthly annuity is increased because of each child, subject to a maximum payment equal to 66-2/3 percent of the earned pension. Monthly benefits payable to a widow of a member who was covered by Social Security as a State employee are reduced by one-half of the amount of benefits she is entitled to as a widow from Social Security (reduced by one-half of the amount of benefits she is entitled to based on her own Primary Insurance Amount). For benefits granted on or after January 1, 1992, the reduction may not exceed 50 percent of the amount of widow's annuity otherwise payable. Any member who retires on or after July 1, 2009, will have the option at the time of retirement to remove the offset provision. In exchange for the removal, SERS will reduce the member’s retirement annuity by 3.825 percent.

Duration of Payment

The monthly payment to the widow continues for her lifetime whether or not she remarries. If the amount of benefit was increased because of eligible children, it is adjusted downward as these children's benefits are terminated (death, marriage or attainment of age 18 or 22).

Annual Increases in Annuity

If the member's death occurs before retirement, increases of 3.0 percent of the current annuity are granted to widows effective each January 1 occurring on or after the first anniversary of the annuity (i.e., increases are compounded). If the member's death occurs after retirement, the initial 3.0 percent increase applies on the January 1 on or after the widow's annuity begins.

Occupational Death Benefit

Qualification of Survivors

If a member's death results from an injury on the job or a job related cause, the spouse may be eligible for an Occupational Death benefit. If only unmarried children under age 18 (age 22 if full-time student) survive, they would be eligible for the benefit. If neither a spouse nor eligible children survive, a dependent father or mother would be eligible.

Amount and Duration of Payment

The nominated beneficiary receives a lump sum payment consisting of all contributions made by the member plus interest credited to his account.

A surviving spouse is entitled to a monthly benefit equal to 50 percent of the member's final average compensation. The benefit is payable for the remaining lifetime of the spouse without regard to remarriage. If children under age 18 (age 22 if full-time student) also survive, the annuity is increased by 15 percent of such average because of each child, subject to a maximum of 75 percent. If there is no spouse, or if the spouse dies before all children have attained age 18 (age 22 if full-time student), each child receives a monthly allowance of 15 percent of final average compensation.

The combined payment to children may not exceed 50 percent of the member's final average compensation. Payments to or on account of children terminate upon their death, marriage or attainment of age 18 (age 22 if full-time student).

If there is no spouse or eligible children, a benefit of 25 percent of final average compensation is payable to each surviving dependent parent for life.

Annual Increases in Annuity

Increases of 3.0 percent of the current annuity are granted effective each January 1 occurring on or after the first anniversary of the annuity (i.e., increases are compounded).

Reductions

The monthly benefit is reduced by any payments awarded under the Workmen's Compensation or Occupational Diseases Acts.

Other Death Benefits

If the survivor beneficiaries of the member do not qualify for any of the previously described death benefits, one of the following benefits is payable to the nominated beneficiary on file with the System at the date of death.

Before Retirement

If the member's death occurred while in State service the benefit consists of: (1) a refund of all contributions plus interest credited to the member's account; and (2) a payment equal to one month's

salary for each full year of pension credit not to exceed six month's salary. The minimum payment is equal to one month's salary.

If the member had terminated State service but not yet qualified for a pension, the benefit consists of a refund of all of the member's contributions to the System plus the interest credited to the member's account.

After Retirement

The benefit consists of a lump sum payment equal to the excess of contributions plus interest credited to the member's account over the total amount of pension payments made to the member. The minimum payment is $500.00.

Non-Occupational Disability Benefits

Qualification and Amount of Payment

Available to any member who has established at least one and one-half years of creditable service and who has been granted a disability leave of absence by his employing agency. The benefit is 50 percent of the member's final average compensation plus a credit to the member's account of service and contributions. It begins on the 31st day of absence from service on account of disability.

If the member has Social Security coverage as a State employee, the benefit payable by the System is reduced by the amount of any disability payment to which he is entitled under Social Security.

Duration of Payment

The member is eligible for the monthly benefit until the occurrence of any of the following events: (1) disability ceases; (2) resumption of gainful employment; (3) payments are made for a period of time equal to one-half of the service credit established as of the date disability began; or (4) attainment of age 65 if the benefit commences prior to age 60, or payment for 5 years if benefit commences after age 60.

If termination of the benefit is due to the member receiving benefits for a period of time equal to one-half of the service credit established at the date of disability, he shall be eligible for a retirement annuity if he has attained age 55 and has 15 years of service, or if he has attained age 50 and has 20 years of service.

Annual Increases in Annuity

A one-time increase of 7.0 percent of the original annuity is granted to members on the January 1 following the fourth anniversary of the annuity. Increases of 3.0 percent of the current annuity are then granted to members each January 1 following the 7.0 percent increase (i.e., the 3.0 percent increases are compounded).

Occupational Disability Benefit

Qualification and Amount of Payment

Provided for any member who becomes disabled as the direct result of injury or diseases arising out of and in the course of State employment.

The benefit is 75 percent of final average compensation plus a credit to the member's account of service and contributions. The cash benefit is reduced by any payment received under the Workmen's Compensation or Occupational Diseases Acts.

Duration of Payment

Monthly benefits are payable until the occurrence of any of the following events: (1) disability ceases; (2) resumption of gainful employment; or (3) attainment of age 65 if the benefit commences prior to age 60, or payment for five years if the benefit commences after age 60.

If termination of the benefit is due to the member having attained age 65 or having received benefits for five years after age 60, the member is entitled to a retirement pension based upon service credit established as of that date.

Annual Increases in Annuity

A one-time increase of 7.0 percent of the original annuity is granted to members on the January 1 following the fourth anniversary of the annuity. Increases of 3.0 percent of the current annuity are then granted to members each January 1 following the 7.0 percent increase (i.e., the 3.0 percent increases are compounded).

Temporary Disability Benefit

A member who is initially denied Workers' Compensation benefits and is appealing the denial may receive payment at the non-occupational rate, 50 percent of pay, providing all eligibility requirements for the non-occupational benefit are met, until the determination is made.

Separation Benefits

Upon termination of State employment by resignation, discharge, dismissal or layoff, a member may obtain a refund of the contributions made to the System. By accepting a refund, a member forfeits all accrued rights and benefits in the System for himself and his beneficiaries.

Provisions Applicable to Members Hired after December 31, 2010, as a result of Public Act 96-0889 ("Tier 2")

Final Average Compensation

Based on last eight years of service and may not exceed $106,800, as automatically increased by the lesser of 3 percent or one-half of the annual increase in the consumer price index-u during the preceding 12-month calendar year.

Retirement Eligibility – All Members Except State policemen, fire fighters in the fire protection service of a department or security employees of the Department of Corrections or the Department of Juvenile Justice

Normal retirement – 67 years old with 10 years of service.

Early Retirement – 62 years old with 10 years of service with a 6.0 percent per year reduction in benefit for each year age is under 67.

Retirement Eligibility – State policemen, fire fighters in the fire protection service of a department or security employees of the Department of Corrections or the Department of Juvenile Justice

Normal retirement – 60 years old with 20 years of service.

Annual Increases in Annuity

Annual increases begin at the later of the first anniversary of retirement or age 67. The annual increases are equal to the lesser of 3.0 percent or one-half of the annual increase in the consumer price index-u during the preceding 12-month calendar year and are not compounded.

Survivor Benefits

Benefit equal to 66.67 percent of the earned retirement benefit at death. Survivor benefits are increased by the lesser of 3.0 percent or one-half of the annual increase in the consumer price index-u during the preceding 12-month calendar year and are not compounded.

Miscellaneous

State policeman, a fire fighter in the fire protection service of a department or a security employee of the Department of Corrections or the Department of Juvenile are still eligible for Alternate formula benefits as defined in section 14-110 of the Illinois Pension Code.

Salary and COLA Development for Members Hired on or After January 1, 2011

Year Ending	CPI-U	1/2 CPI-U	COLA	Maximum Annual Pensionable Earnings
2011			3.00%	$106,800.00
2012	3.90%	1.95%	1.95%	$108,882.60
2013	2.00%	1.00%	1.00%	$109,971.43
2014	1.20%	0.60%	0.60%	$110,631.26
2015	1.70%	0.85%	0.85%	$111,571.63
2016	0.00%	0.00%	0.00%	$111,571.63
2017	1.50%	0.75%	0.75%	$112,408.42
2018	2.20%	1.10%	1.10%	$113,644.91

Provisions Applicable to Certain Current and Future Members not covered by Social Security, as a result of Public Act 100-0023 ("Tier 3")

Defined Benefit Provisions

Final Average Compensation

Based on last 10 years of service and may not exceed the federal Social Security Wage Base, currently $128,400 for calendar year 2018.

Retirement Eligibility

The greater of Normal Retirement Age under Social Security or age 67 years old with 10 years of service.

Benefit Formula

The member's benefit is equal to 1.25 percent for each year of service.

Annual Increases in Annuity

Annual increases begin on the first anniversary of retirement. The annual increases are equal to the one-half of the annual increase in the consumer price index-w during the preceding 12-month calendar year and are not compounded.

Survivor Benefits

Benefit equal to 66.67 percent of the earned retirement benefit at death. Survivor benefits are increased by one-half of the annual increase in the consumer price index-w during the preceding 12-month calendar year and are not compounded.

Member Contributions

Members contribute the lesser of 6.2 percent of pensionable compensation and the total normal cost rate for the Tier 3 plan.

Defined Contribution Provisions

Plan consists of employee and employer contributions and investment income earned on such contributions.

Administrative fees will be deducted as a uniform percentage of each participating member's employee contributions.

Employer Contributions

Employer contributions are at a rate between 2.0 percent and 6.0 percent of salary.

Employer contributions vest immediately.

Member Contributions

Member contribution rate equals 4.0 percent of salary.

Provisions Applicable to the Accelerated Pension Benefit Payment Program, as a result of Public Act 100-0587

Vested Inactive Accelerated Pension Benefit Payment Option – Tiers 1 and 2

Eligibility requirements for an accelerated pension benefit payment:

- Member must have terminated service;
- Member must have enough service credit to qualify for a retirement annuity; and
- Member cannot have received a retirement annuity.

Members who elect this option will forfeit all rights to future benefit payments, but retain access to state retiree healthcare. The payment will equal 60 percent of the present value of the retirement benefits which the member is entitled to at the date they elect this payment, including automatic annual increases (AAI), survivor benefits and disability benefits. The System will calculate the present value of the benefit using actuarial factors.

Members forfeit all service credit for all purposes under the Illinois Pension Code, including benefits provided under the Illinois Reciprocal Act. However, the years of service credit may be considered when determining eligibility for retiree healthcare benefits and the member's share of retiree healthcare premiums.

This election is irrevocable and any member who elects this option and later returns to service will be eligible for a benefit based solely on future service and will not have the option to repay the amount received under this program to reestablish the previous service credit.

Accelerated Pension Benefit Payment at Retirement Option – Tier 1 Only

Eligibility requirements for this payment option:

- Member must have terminated service;
- Member must be eligible for a retirement annuity; and
- Member cannot have received a retirement annuity.

At retirement, Tier 1 members could elect to forfeit the Tier 1, 3 percent compounded AAI and instead receive 1.5 percent non-compounded AAIs, beginning the January 1st following the 1st anniversary of retirement or the 67th birthdate, whichever is later. Survivors of members that elect this option will also receive 1.5 percent non-compounded AAIs beginning on the January 1st following the anniversary of the start of the survivor annuity.

Members who elect to forego the Tier 1 AAIs will receive a lump sum payment equal to 70 percent of the difference in the present value of the Tier 1 AAI and the 1.5 percent non-compounded AAI, as calculated by the System. In the calculation, the System will use current actuarial assumptions and all relevant member information. Buyout payments are subject to applicable withholding and taxation provisions and must be transferred to a qualified retirement plan authorized by the IRS.

SECTION G

GLOSSARY OF TERMS

Glossary of Terms

Actuarial Accrued Liability ("AAL")	The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs.
Actuarial Assumptions	Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items.
Actuarial Cost Method	A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability.
Actuarial Equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value ("APV")	The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made.
Actuarial Present Value of Future Benefits ("APVFB")	The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits and inactive, nonretired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the actuarial valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation	The determination, as of an actuarial valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB No. 67, such as the Funded Ratio and the Actuarially Determined Contribution ("ADC").
Actuarial Value of Assets	The value of the assets as of a given date, used by the actuary for actuarial valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio, or contribution requirement.

Glossary of Terms

Actuarially Determined Contribution ("ADC")	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and Amortization Payment.
Amortization Method	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase.
Amortization Payment	That portion of the plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Amortization Period	The period used in calculating the Amortization Payment.
Closed Amortization Period	A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc.
Employer Normal Cost	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Equivalent Single Amortization Period	For plans that do not establish separate amortization bases (separate components of the UAAL), this is the same as the Amortization Period. For plans that do establish separate amortization bases, this is the period over which the UAAL would be amortized if all amortization bases were combined upon the current UAAL payment.
Experience Gain/Loss	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two actuarial valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience; e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience; i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected.

Glossary of Terms

Funded Ratio	The ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability.
GASB	Governmental Accounting Standards Board.
GASB No. 67 and GASB No. 68	These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68, which replaced Statement No. 27 effective with the fiscal year ending June 30, 2015, sets the accounting rules for the employers that sponsor or contribute to public retirement systems. Statement No. 67, which replaced Statement No. 25 effective with fiscal year ending June 30, 2014, sets the rules for the systems themselves.
Normal Cost	The annual cost assigned, under the Actuarial Cost Method, to the current plan year.
Open Amortization Period	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.
Unfunded Actuarial Accrued Liability	The difference between the Actuarial Accrued Liability and Actuarial Value of Assets.
Valuation Date	The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date.

SECTION H

ADDITIONAL PROJECTION DETAILS

Table 11
Additional Projection Details — Actuarial Accrued Liability
($ in Millions)

Valuation Date June 30	Current Inactives		Actives (Including Disabilities)			Grand Totals		
	Retirees & Beneficiaries	Deferreds	Tier 1	Current Tier 2	Future Tier 2	Current Retirees, Beneficiaries & Deferreds	Actives	Total
2018	$ 33,029.27	$ 743.72	$ 13,839.42	$ 313.27	$ -	$ 33,772.99	$ 14,152.69	$ 47,925.68
2019	32,830.13	782.73	15,481.89	412.21	-	33,612.86	15,894.10	49,506.96
2020	32,581.26	815.44	17,125.99	520.03	12.80	33,396.70	17,658.82	51,055.52
2021	32,281.64	845.85	18,764.09	639.00	38.83	33,127.49	19,441.92	52,569.40
2022	31,930.34	873.89	20,382.99	770.12	80.09	32,804.23	21,233.20	54,037.42
2023	31,526.60	899.65	21,971.12	914.72	138.26	32,426.25	23,024.10	55,450.35
2024	31,069.84	922.89	23,516.11	1,073.81	215.44	31,992.73	24,805.36	56,798.09
2025	30,559.75	943.10	25,007.51	1,247.74	314.21	31,502.85	26,569.46	58,072.30
2026	29,996.30	960.24	26,437.72	1,437.05	436.82	30,956.54	28,311.59	59,268.13
2027	29,379.79	974.32	27,798.47	1,642.72	588.04	30,354.11	30,029.22	60,383.33
2028	28,710.91	985.52	29,087.71	1,864.82	771.04	29,696.43	31,723.57	61,420.00
2029	27,990.70	1,000.17	30,304.02	2,102.93	988.23	28,990.86	33,395.19	62,386.05
2030	27,220.60	1,012.12	31,443.33	2,358.50	1,242.25	28,232.72	35,044.08	63,276.80
2031	26,402.56	1,021.40	32,500.60	2,632.03	1,535.64	27,423.96	36,668.27	64,092.23
2032	25,538.90	1,028.17	33,467.91	2,923.11	1,871.46	26,567.07	38,262.47	64,829.54
2033	24,632.49	1,032.37	34,341.29	3,231.84	2,252.73	25,664.86	39,825.85	65,490.71
2034	23,686.75	1,034.00	35,117.95	3,558.19	2,682.55	24,720.75	41,358.69	66,079.44
2035	22,705.54	1,033.16	35,790.10	3,901.48	3,164.58	23,738.70	42,856.16	66,594.87
2036	21,693.24	1,029.63	36,349.85	4,261.11	3,702.83	22,722.87	44,313.80	67,036.66
2037	20,654.65	1,023.47	36,796.03	4,635.97	4,301.26	21,678.12	45,733.26	67,411.37
2038	19,594.99	1,014.77	37,128.98	5,023.94	4,963.68	20,609.75	47,116.61	67,726.36
2039	18,519.85	1,003.46	37,349.50	5,424.96	5,692.51	19,523.31	48,466.98	67,990.29
2040	17,435.12	989.56	37,459.84	5,840.73	6,488.85	18,424.68	49,789.43	68,214.11
2041	16,346.89	973.13	37,462.31	6,270.48	7,354.35	17,320.02	51,087.14	68,407.16
2042	15,261.39	954.22	37,360.65	6,711.48	8,290.89	16,215.61	52,363.01	68,578.63
2043	14,184.87	932.88	37,158.75	7,160.95	9,300.43	15,117.75	53,620.13	68,737.88
2044	13,123.51	909.24	36,860.04	7,615.55	10,384.58	14,032.75	54,860.16	68,892.91
2045	12,083.34	883.42	36,467.60	8,070.11	11,544.97	12,966.76	56,082.67	69,049.43

Table 12
Additional Projection Details — Present Value of Future Benefits
($ in Millions)

Valuation Date June 30	Current Inactives		Actives (Including Disabilities)			Grand Totals		
	Retirees & Beneficiaries	Deferreds	Tier 1	Current Tier 2	Future Tier 2	Current Retirees, Beneficiaries & Deferreds	Actives	Total
2018	$ 33,029.27	$ 743.72	$ 19,965.99	$ 2,193.31	$ -	$ 33,772.99	$ 22,159.30	$ 55,932.29
2019	32,830.13	782.73	21,243.17	2,311.93	261.49	33,612.86	23,816.58	57,429.45
2020	32,581.26	815.44	22,517.02	2,438.52	556.67	33,396.70	25,512.21	58,908.91
2021	32,281.64	845.85	23,782.02	2,574.23	892.41	33,127.49	27,248.65	60,376.14
2022	31,930.34	873.89	25,029.43	2,719.46	1,260.72	32,804.23	29,009.61	61,813.84
2023	31,526.60	899.65	26,251.26	2,875.16	1,661.86	32,426.25	30,788.28	63,214.53
2024	31,069.84	922.89	27,439.15	3,042.12	2,102.09	31,992.73	32,583.36	64,576.10
2025	30,559.75	943.10	28,585.87	3,220.53	2,570.37	31,502.85	34,376.76	65,879.61
2026	29,996.30	960.24	29,685.61	3,410.59	3,073.29	30,956.54	36,169.50	67,126.04
2027	29,379.79	974.32	30,732.25	3,613.05	3,610.49	30,354.11	37,955.79	68,309.90
2028	28,710.91	985.52	31,723.14	3,827.78	4,170.10	29,696.43	39,721.01	69,417.44
2029	27,990.70	1,000.17	32,655.57	4,053.77	4,766.91	28,990.86	41,476.25	70,467.12
2030	27,220.60	1,012.12	33,525.52	4,291.61	5,396.90	28,232.72	43,214.03	71,446.75
2031	26,402.56	1,021.40	34,328.32	4,541.36	6,068.92	27,423.96	44,938.60	72,362.56
2032	25,538.90	1,028.17	35,058.14	4,802.55	6,783.01	26,567.07	46,643.69	73,210.76
2033	24,632.49	1,032.37	35,711.49	5,075.08	7,537.78	25,664.86	48,324.35	73,989.21
2034	23,686.75	1,034.00	36,285.47	5,358.78	8,343.59	24,720.75	49,987.84	74,708.58
2035	22,705.54	1,033.16	36,774.41	5,653.08	9,209.35	23,738.70	51,636.83	75,375.54
2036	21,693.24	1,029.63	37,172.76	5,957.48	10,130.03	22,722.87	53,260.27	75,983.14
2037	20,654.65	1,023.47	37,478.67	6,271.14	11,102.40	21,678.12	54,852.21	76,530.32
2038	19,594.99	1,014.77	37,691.03	6,592.62	12,135.44	20,609.75	56,419.09	77,028.85
2039	18,519.85	1,003.46	37,809.35	6,921.77	13,231.12	19,523.31	57,962.24	77,485.55
2040	17,435.12	989.56	37,833.94	7,259.32	14,387.82	18,424.68	59,481.09	77,905.77
2041	16,346.89	973.13	37,765.38	7,604.38	15,607.89	17,320.02	60,977.65	78,297.67
2042	15,261.39	954.22	37,605.16	7,954.76	16,893.02	16,215.61	62,452.94	78,668.56
2043	14,184.87	932.88	37,355.02	8,308.28	18,244.50	15,117.75	63,907.80	79,025.56
2044	13,123.51	909.24	37,016.69	8,662.23	19,666.94	14,032.75	65,345.87	79,378.62
2045	12,083.34	883.42	36,591.83	9,012.69	21,160.64	12,966.76	66,765.17	79,731.93

Table 13
Additional Projection Details — Benefit Payments Including Administrative Expenses and Disability Payments
($ in Millions)

Valuation Date June 30	Current Inactives		Actives (Including Disabilities)			Grand Totals		
	Retirees & Beneficiaries	Deferreds	Tier 1	Current Tier 2	Future Tier 2	Current Retirees, Beneficiaries & Deferreds	Actives	Total
2018	$ 2,427.66	$ 12.61	$ 116.43	$ 33.75	$ 0.00	$ 2,440.27	$ 150.18	$ 2,590.45
2019	2,462.26	21.35	206.08	34.07	6.32	2,483.60	246.47	2,730.08
2020	2,494.48	25.79	300.84	33.83	12.64	2,520.27	347.30	2,867.57
2021	2,524.16	30.13	403.46	33.80	19.04	2,554.29	456.30	3,010.59
2022	2,551.09	34.23	512.58	33.51	25.90	2,585.32	572.00	3,157.32
2023	2,575.02	38.41	628.09	33.15	33.00	2,613.43	694.25	3,307.67
2024	2,595.67	42.92	748.28	33.40	40.43	2,638.59	822.10	3,460.69
2025	2,612.74	47.24	871.28	34.20	48.18	2,659.98	953.66	3,613.65
2026	2,625.90	51.37	997.05	35.08	54.20	2,677.27	1,086.33	3,763.59
2027	2,634.80	55.11	1,121.77	36.91	60.31	2,689.92	1,219.00	3,908.91
2028	2,639.17	52.53	1,245.34	40.56	66.52	2,691.70	1,352.41	4,044.11
2029	2,638.65	56.13	1,368.84	44.39	73.16	2,694.78	1,486.40	4,181.18
2030	2,632.90	59.52	1,492.62	48.98	80.32	2,692.41	1,621.93	4,314.34
2031	2,621.63	62.57	1,617.52	54.82	88.18	2,684.21	1,760.51	4,444.72
2032	2,604.51	65.52	1,740.82	61.52	96.89	2,670.03	1,899.23	4,569.26
2033	2,581.21	68.29	1,861.76	69.18	106.39	2,649.49	2,037.34	4,686.83
2034	2,551.48	70.78	1,982.82	78.13	116.85	2,622.27	2,177.80	4,800.07
2035	2,515.15	73.33	2,103.48	88.28	128.51	2,588.48	2,320.26	4,908.75
2036	2,472.06	75.63	2,219.81	99.92	141.35	2,547.69	2,461.08	5,008.77
2037	2,422.14	77.67	2,330.94	113.59	155.46	2,499.82	2,600.00	5,099.81
2038	2,365.40	79.61	2,436.22	127.94	172.15	2,445.00	2,736.31	5,181.31
2039	2,301.92	81.34	2,534.85	142.08	192.02	2,383.26	2,868.95	5,252.21
2040	2,231.89	82.85	2,626.56	157.68	214.87	2,314.74	2,999.10	5,313.84
2041	2,155.61	84.13	2,710.53	175.87	240.76	2,239.74	3,127.17	5,366.91
2042	2,073.48	85.20	2,786.62	196.55	269.80	2,158.68	3,252.98	5,411.65
2043	1,985.97	85.98	2,854.95	220.05	302.25	2,071.95	3,377.25	5,449.20
2044	1,893.66	86.49	2,915.70	247.39	338.40	1,980.15	3,501.49	5,481.65
2045	1,797.22	86.78	2,968.76	279.16	378.38	1,884.00	3,626.30	5,510.31

Table 14
Additional Projection Details — Active Population, Covered Payroll, Employee Contributions and Normal Costs
($ in Millions)

Valuation Date	Tier 1 Active Members				Current Tier 2 Active Members				Future Tier 2 Active Members			
June 30	Population	Covered Payroll	Employee Contributions	Normal Cost	Population	Covered Payroll	Employee Contributions	Normal Cost	Population	Covered Payroll	Employee Contributions	Normal Cost
2018	40,258	$ 3,164.42	$ 180.20	$ 767.73	21,139	$ 1,143.20	$ 62.93	$ 108.20	$ -	$ -	$ -	$ -
2019	37,117	3,032.48	173.16	747.81	19,452	1,114.32	62.20	110.41	4,828	246.78	11.55	18.69
2020	34,323	2,911.63	166.50	725.51	18,328	1,106.49	62.35	113.65	8,746	465.64	22.12	36.93
2021	31,605	2,781.17	159.01	698.71	17,417	1,105.45	62.82	117.31	12,375	685.75	32.96	56.31
2022	28,983	2,643.95	150.86	668.54	16,639	1,108.21	63.45	121.19	15,775	909.81	44.13	76.72
2023	26,480	2,502.54	142.33	634.87	15,948	1,112.94	64.17	125.05	18,968	1,137.82	55.59	98.25
2024	24,058	2,354.08	133.11	598.69	15,302	1,117.73	64.89	128.87	22,037	1,374.47	67.64	121.34
2025	21,780	2,206.53	123.97	561.62	14,709	1,123.41	65.65	132.77	24,907	1,614.67	79.85	145.45
2026	19,625	2,058.21	114.71	523.45	14,164	1,130.21	66.46	136.66	27,607	1,859.57	92.37	170.83
2027	17,602	1,909.82	105.48	486.97	13,630	1,135.76	67.22	140.46	30,166	2,110.24	105.15	197.44
2028	15,794	1,772.97	97.21	452.78	13,124	1,142.14	68.01	144.56	32,479	2,359.03	117.66	224.31
2029	14,106	1,637.77	89.10	419.53	12,684	1,150.80	68.92	149.15	34,607	2,608.94	130.27	251.85
2030	12,558	1,508.28	81.59	386.91	12,283	1,160.50	69.88	153.82	36,557	2,859.18	142.80	279.89
2031	11,108	1,379.08	73.99	353.28	11,889	1,168.32	70.65	158.10	38,401	3,115.10	155.63	308.91
2032	9,766	1,251.94	66.40	320.32	11,494	1,173.40	71.23	162.17	40,137	3,376.11	168.68	338.83
2033	8,546	1,131.15	59.37	288.67	11,110	1,176.85	71.70	165.97	41,741	3,639.19	181.72	369.47
2034	7,421	1,014.05	52.56	256.12	10,714	1,176.52	71.90	169.22	43,262	3,908.14	195.06	401.31
2035	6,358	895.78	45.49	222.64	10,308	1,171.83	71.78	171.92	44,731	4,185.38	208.91	434.71
2036	5,389	782.39	38.73	191.29	9,898	1,163.13	71.40	173.96	46,110	4,467.34	222.97	469.29
2037	4,540	679.73	32.86	162.77	9,476	1,149.20	70.64	174.94	47,381	4,751.57	237.02	504.78
2038	3,781	583.71	27.45	136.83	9,031	1,129.08	69.40	175.64	48,585	5,041.54	251.33	540.83
2039	3,131	498.46	22.86	114.02	8,632	1,110.02	68.32	176.90	49,634	5,327.32	265.29	576.65
2040	2,564	421.01	18.84	93.98	8,254	1,089.90	67.17	177.87	50,579	5,610.97	279.07	612.47
2041	2,087	353.25	15.47	77.12	7,864	1,064.35	65.70	177.86	51,446	5,894.64	292.74	648.47
2042	1,689	295.12	12.72	63.18	7,458	1,033.41	63.88	176.90	52,250	6,179.37	306.34	684.71
2043	1,359	245.20	10.44	51.58	7,055	999.35	61.80	174.94	52,983	6,461.74	319.78	720.96
2044	1,087	202.67	8.55	41.94	6,636	959.75	59.37	171.47	53,673	6,744.53	333.20	757.46
2045	865	166.54	6.97	33.93	6,200	914.37	56.49	166.34	54,333	7,026.48	346.55	794.08

Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.
Active member population includes disabilities.

SECTION I

STRESS TESTING SCENARIOS

GRS Retirement Consulting

P: 312.456.9800 | F: 312.683.3271 | www.grsconsulting.com

December 19, 2018

Board of Trustees
State Employees' Retirement System of Illinois
2101 South Veterans Parkway
P.O. Box 19255
Springfield, IL 62794-9255

Re: Stress Testing Scenarios Based on Actuarial Valuation Results as of June 30, 2018

Dear Members of the Board:

At your request, we have performed stress testing of the required statutory contributions and funded ratio for the State Employees' Retirement System of Illinois ("SERS") based on the results of the June 30, 2018, actuarial valuation. This stress testing was performed to illustrate the projected impact on actuarial valuation results (including the annual contribution requirement and funded ratio) if there is a significant market downturn or significant volatility in investment returns, volatility in future active population, or volatility in salary growth.

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

Exhibit A-1 contains the rates of return used for the investment return stress test. The investment return stress test analysis projects the actuarial valuation results assuming that the plan assets earn 7.00 percent, the 25th percentile return of 4.16 percent, and the 40th percentile return of 5.72 percent. In order to demonstrate the risk and volatility of the returns, we are providing results assuming both static returns of 7.00 percent, 4.16 percent, or 5.72 percent and volatile returns that produce 27-year geometric average returns of 7.00 percent, 4.16 percent, or 5.72 percent. In the baseline scenario and Scenarios 1 through 5, the discount rate used to determine liabilities remains at 7.00 percent, average future uncapped salary growth or wage inflation remains at 3.00 percent per year and the future active population remains constant at 61,397 members. Please note that each volatility 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. The 25th and 40th percentile returns used in Scenarios 2 through 5 were determined based on the expected investment return and the current target asset allocation of the System as of the most recent economic study issued to the System on April 17, 2018.

In addition to the investment return stress test scenarios, we have provided scenarios that stress test the required statutory contributions and funded ratio based on fluctuations in future active population and salary growth. In order to demonstrate the risk and volatility associated with changes to the future active

population and uncapped salary growth, we are providing results under the following scenarios: Scenario 6 – future active population increases 1,000 members per year for five years and then remains static; Scenario 7 – future active population decreases 1,000 members per year for five years and then remains static; Scenario 8 – wage inflation increases by one percentage point from the assumed rate of 3.00 percent per year to 4.00 percent per year; and Scenario 9 – wage inflation decreases by one percentage point from the assumed rate of 3.00 percent per year to 2.00 percent per year. In Scenarios 6 through 9, the investment return assumption and discount rate used to determine the liabilities remain at 7.00 percent.

GRS believes that these scenarios provide a reasonable illustration of potential future volatility of investment returns, population, salary growth and the resulting actuarial valuation results. 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 A-1 and the 27-year geometric average of actual returns may be either higher or lower than the assumption of 7.00 percent.

Exhibits B-1 through B-8 contains the numerical results of the stress testing.

Analysis of Stress Testing Scenario Results

Baseline – Static 7.00 Percent

Under the projected results from the actuarial valuation as of June 30, 2018, in which all future actuarial assumptions are realized, the statutory dollar contribution increases by a steady rate of approximately 2.62 percent per year beginning in year 2034, once the deferred asset gains and losses are fully recognized in the actuarial value of assets and the statutory contributions are no longer limited by the maximum contribution. The funded ratio does not grow markedly until after 2033, when it increases from 52.4 percent to 90.0 percent in 2045.

Scenario 1 – Volatile 7.00 Percent

In Scenario 1, which is based on the assumption that the 27-year geometric average of the returns is equal to 7.00 percent but with volatility in the year-to-year rate of return, the annual contribution is not as stable as the baseline scenario. Relative to the baseline, the contribution requirement is lower starting in 2021 through 2037, then higher through 2043, lower in 2044, and higher in 2045. The system is projected to be less than 90 percent funded in 2045.

Scenario 2 – Static 4.16 Percent

In Scenario 2, which is based on the assumption that the annual rate of return is equal to 4.16 percent, the annual contribution requirement steadily increases at an increasing rate. Relative to the baseline, the contribution requirement is higher in all years.

Scenario 3 – Volatile 4.16 Percent

In Scenario 3, which is based on the assumption that the 27-year geometric average of the returns is equal to 4.16 percent but with volatility in the year-to-year rate of return, the annual contribution requirement relative to the baseline is slightly lower in 2021 and 2022, but higher in all other years. In this Scenario, the unfunded liability increases through 2032, then decreases significantly through 2045. This Scenario demonstrates that while the long-term geometric average may be the same as Scenario 2, the pattern of contributions can be significantly different.

Scenario 4 – Static 5.72 Percent

In Scenario 4, which is based on the assumption that the annual rate of return is equal to 5.72 percent, the annual contribution requirement steadily increases at an increasing rate. Relative to the baseline, the contribution requirement is higher in all years. Relative to Scenario 2, the rate of increase is lower because more investment income is used to fund benefits.

Scenario 5 – Volatile 5.72 Percent

In Scenario 5, which is based on the assumption that the 27-year geometric average of the returns is equal to 5.72 percent but with volatility in the year-to-year rate of return, the annual contribution requirement increases through 2027, then decreases in 2028 through 2032, then increases through 2039, decreases in 2040, and then increases through 2045. Relative to the baseline, the contribution requirement is lower only in 2028 through 2035, and higher for all other years through 2045. Again, this Scenario demonstrates that while the long-term geometric average may be the same as Scenario 4, the pattern of contributions can be drastically different.

Scenario 6 – Increases in Active Population

Scenario 6 is based on the assumption that the active population will increase by 1,000 members each year for five years from 61,397 members in 2019 to 66,397 in 2024 and then remain constant for years on and after 2024. Under this scenario the statutory dollar contribution increases by a steady rate of approximately 2.67 percent per year beginning in year 2034 once the deferred asset gains and losses are fully recognized in the actuarial value of assets and the statutory contributions are no longer limited by the maximum contribution. Relative to the baseline, the contribution requirement is lower in 2021 through 2023 as the payroll base increases with incremental increases in population. Beginning in 2024, the annual contribution requirement is slightly higher through 2045 with increases relative to the baseline at an average rate of 1.36 percent per year beginning in year 2024, as the population stabilizes at 5,000 members greater than the baseline.

Scenario 7 – Decreases in Active Population

Scenario 7 is based on the assumption that the active population will decrease by 1,000 members each year for five years from 61,397 members in 2019 to 56,397 in 2024 and then remain constant for years on and after 2024. Under this scenario the statutory contribution increases by a steady rate of approximately 2.57 percent per year beginning in year 2034 once the deferred asset gains and losses are fully recognized in the actuarial value of assets and the statutory contributions are no longer limited by the maximum contribution. Relative to the baseline, the contribution requirement is higher in years 2021 through 2023 as the payroll base decreases with incremental decreases in population. Beginning in 2024, the annual contribution requirement is slightly lower through 2045 with decreases relative to the baseline at an average rate of 1.47 percent per year beginning in year 2024, as the population stabilizes at 5,000 members less than the baseline.

Scenario 8 – Increased Salary Growth

Scenario 8 is based on the assumption that uncapped salary growth for active members will increase from the baseline assumption of 3.00 percent per year to 4.00 percent per year, limited by the statutory cap. Under this scenario the statutory contribution increases by a steady rate of approximately 2.38 percent per year beginning in year 2034 once the deferred asset gains and losses are fully recognized in the actuarial value of assets and the statutory contributions are no longer limited by the maximum contribution. Relative to the baseline, the contribution requirement is higher for all years starting in 2022 through 2045.

Scenario 9 – Decreased Salary Growth

Scenario 9 is based on the assumption that uncapped salary growth for active members will decrease from the baseline assumption of 3.00 percent per year to 2.00 percent per year, limited by the statutory cap. Under this scenario the statutory contribution increases by a steady rate of approximately 1.90 percent per year beginning in year 2034 once the deferred asset gains and losses are fully recognized in the actuarial value of assets and the statutory contributions are no longer limited by the maximum contribution. Relative to the baseline, the contribution requirement is higher in years 2021 through 2025 and then lower through 2045.

In all Scenarios, it is apparent that based on the funding policy of attaining 90 percent funding in 2045, market volatility will have a larger impact on the statutory contribution as the number of years until 2045 becomes shorter.

In Scenario 1, the funded ratio is less than 90 percent in year 2045 due to significant unfavorable investment returns in the projection period and shorter period of time until 2045. In Scenarios 2 through 5, the funded ratio is not 90 percent in the year 2045 because of deferred asset gains and losses that have not been fully recognized in the actuarial value of assets. This is a result of the fact that the assumed investment return in each of these Scenarios is not equal to the valuation assumption of 7.00 percent.

In each projection Scenario, the actuarial valuations in each year have been projected as though an actuarial valuation in each of those years was performed. The market value of assets at each projected actuarial valuation is assumed to have a rate of return according to the Scenario being modeled for that one year and the valuation interest rate going forward. At each projected actuarial valuation, an additional 20 percent of the investment gains and losses are recognized. This iterative process is followed for each projection year through 2045.

Statutory contributions in each projection scenario were determined in accordance with Public Act 100-0023, which modified the State's funding policy beginning in fiscal year 2018, by phasing in contribution rate variances due to changes in actuarial assumptions over a five-year period. The phase-in schedule used to determine the statutory contributions can be found in the June 30, 2018, draft actuarial valuation report.

It is important to note that the Scenarios presented in this letter represent an extremely small sample of possibilities.

In each scenario, we have assumed that the plan sponsor 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 qualified to opine on the sponsor's ability to pay the statutory contribution when due.

To the best of our knowledge, this actuarial statement is complete and accurate, fairly presents the actuarial position of SERS as of June 30, 2018, based on the 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 in this report.

This letter is part of the actuarial valuation as of June 30, 2018, and is subject to the same actuarial assumptions and disclosures as used in the presentation and annual actuarial valuation report. The investment return stress testing scenarios used future investment returns as shown in Exhibit A-1 and the population and salary growth stress testing scenarios used future populations and wage inflation assumptions as shown in exhibits A-2 and A-3. All other assumptions and methods were the same as the actuarial valuation.

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 adherence to a funding policy, such as the Board policy used to the calculate the ADC under GASB Statement Nos. 67 and 68, that funds the normal cost of the plan as well as an amortization payment that seeks to pay off any unfunded accrued liability over a closed period of 25 years beginning July 1, 2015.

The signing actuaries are independent of the plan sponsor.

Alex Rivera and Lance Weiss are members of the American Academy of Actuaries ("MAAA") and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

This communication shall not be construed to provide tax advice, legal advice or investment advice.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

Alex Rivera, FSA, EA, MAAA
Senior Consultant

Lance J. Weiss, EA, MAAA, FCA
Senior Consultant

cc: Mr. Ryan Gundersen, Gabriel, Roeder, Smith & Company

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Assumed Rates of Investment Return
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS						
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**
Investment Return Assumption	7.00% per year	Varying Rates for the first 27 years, 7.00% per year thereafter	4.16% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter	5.72% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter
27-Year Geometric Return	7.00%	7.00%	4.16%	4.16%	5.72%	5.72%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 27 years **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with** volatility, based on the System's asset allocation policy
Fiscal Year	**Rates of Investment Returns**					
2019	7.00%	8.78%	4.16%	7.49%	5.72%	-4.11%
2020	7.00%	23.96%	4.16%	6.55%	5.72%	0.21%
2021	7.00%	12.05%	4.16%	-4.38%	5.72%	15.04%
2022	7.00%	34.18%	4.16%	21.37%	5.72%	20.00%
2023	7.00%	5.87%	4.16%	-0.14%	5.72%	-0.86%
2024	7.00%	-4.43%	4.16%	3.61%	5.72%	2.10%
2025	7.00%	-0.12%	4.16%	-0.88%	5.72%	20.86%
2026	7.00%	1.11%	4.16%	5.65%	5.72%	20.28%
2027	7.00%	-1.50%	4.16%	-4.33%	5.72%	4.18%
2028	7.00%	17.31%	4.16%	-16.47%	5.72%	9.61%
2029	7.00%	17.34%	4.16%	17.73%	5.72%	-3.30%
2030	7.00%	11.47%	4.16%	18.30%	5.72%	27.45%
2031	7.00%	14.47%	4.16%	-0.40%	5.72%	-0.77%
2032	7.00%	-13.90%	4.16%	4.38%	5.72%	-15.67%
2033	7.00%	-2.22%	4.16%	12.08%	5.72%	1.32%
2034	7.00%	3.35%	4.16%	-1.38%	5.72%	9.75%
2035	7.00%	19.24%	4.16%	-0.28%	5.72%	3.07%
2036	7.00%	-13.32%	4.16%	22.20%	5.72%	11.11%
2037	7.00%	6.77%	4.16%	-7.73%	5.72%	14.71%
2038	7.00%	22.50%	4.16%	14.83%	5.72%	13.53%
2039	7.00%	6.77%	4.16%	11.81%	5.72%	-3.49%
2040	7.00%	15.91%	4.16%	-0.70%	5.72%	-10.54%
2041	7.00%	2.21%	4.16%	9.83%	5.72%	-1.20%
2042	7.00%	3.66%	4.16%	9.98%	5.72%	-2.96%
2043	7.00%	-8.60%	4.16%	-3.46%	5.72%	33.06%
2044	7.00%	31.40%	4.16%	10.16%	5.72%	-4.20%
2045	7.00%	-6.49%	4.16%	-11.30%	5.72%	11.58%

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Population
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS					
Scenario	**Baseline; 1-5**	**6**	**7**	**8**	**9**
Investment Return Assumption	7.00% per year	7.00% per year	7.00% per year	7.00% per year	7.00% per year
Wage Inflation Assumption	3.00%	3.00%	3.00%	4.00%	2.00%
Population Growth Assumption	Active population remains constant at 61,397 members through the projection period	Active population increases 1,000 members each year for 5 years and then remains constant at 66,397 members for fiscal years on and after fiscal year 2024	Active population decreases 1,000 members each year for 5 years and then remains constant at 56,397 members for fiscal years on and after fiscal year 2024	Active population remains constant at 61,397 members through the projection period	Active population remains constant at 61,397 members through the projection period
Fiscal Year	**Population**				
2019	61,397	61,397	61,397	61,397	61,397
2020	61,397	62,397	60,397	61,397	61,397
2021	61,397	63,397	59,397	61,397	61,397
2022	61,397	64,397	58,397	61,397	61,397
2023	61,397	65,397	57,397	61,397	61,397
2024	61,397	66,397	56,397	61,397	61,397
2025	61,397	66,397	56,397	61,397	61,397
2026	61,397	66,397	56,397	61,397	61,397
2027	61,397	66,397	56,397	61,397	61,397
2028	61,397	66,397	56,397	61,397	61,397
2029	61,397	66,397	56,397	61,397	61,397
2030	61,397	66,397	56,397	61,397	61,397
2031	61,397	66,397	56,397	61,397	61,397
2032	61,397	66,397	56,397	61,397	61,397
2033	61,397	66,397	56,397	61,397	61,397
2034	61,397	66,397	56,397	61,397	61,397
2035	61,397	66,397	56,397	61,397	61,397
2036	61,397	66,397	56,397	61,397	61,397
2037	61,397	66,397	56,397	61,397	61,397
2038	61,397	66,397	56,397	61,397	61,397
2039	61,397	66,397	56,397	61,397	61,397
2040	61,397	66,397	56,397	61,397	61,397
2041	61,397	66,397	56,397	61,397	61,397
2042	61,397	66,397	56,397	61,397	61,397
2043	61,397	66,397	56,397	61,397	61,397
2044	61,397	66,397	56,397	61,397	61,397
2045	61,397	66,397	56,397	61,397	61,397

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Capped Payroll
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS					
Scenario	**Baseline; 1-5**	**6**	**7**	**8**	**9**
Investment Return Assumption	7.00% per year	7.00% per year	7.00% per year	7.00% per year	7.00% per year
Wage Inflation Assumption	3.00%	3.00%	3.00%	4.00%	2.00%
Population Growth Assumption	Active population remains constant at 61,397 members through the projection period	Active population increases 1,000 members each year for 5 years and then remains constant at 66,397 members for fiscal years on and after fiscal year 2024	Active population decreases 1,000 members each year for 5 years and then remains constant at 56,397 members for fiscal years on and after fiscal year 2024	Active population remains constant at 61,397 members through the projection period	Active population remains constant at 61,397 members through the projection period
Fiscal Year	**Capped Payroll ($ in millions)**				
2019	$4,308	$4,308	$4,308	$4,308	$4,308
2020	4,394	4,445	4,342	4,436	4,351
2021	4,484	4,591	4,377	4,570	4,398
2022	4,572	4,739	4,406	4,702	4,443
2023	4,662	4,893	4,431	4,833	4,487
2024	4,753	5,053	4,454	4,966	4,531
2025	4,846	5,160	4,533	5,100	4,576
2026	4,945	5,272	4,617	5,238	4,626
2027	5,048	5,390	4,706	5,380	4,679
2028	5,156	5,513	4,799	5,525	4,735
2029	5,274	5,646	4,902	5,680	4,799
2030	5,398	5,785	5,010	5,838	4,867
2031	5,528	5,931	5,125	6,000	4,939
2032	5,663	6,081	5,244	6,162	5,015
2033	5,801	6,237	5,366	6,323	5,093
2034	5,947	6,399	5,496	6,487	5,176
2035	6,099	6,567	5,630	6,651	5,263
2036	6,253	6,738	5,768	6,814	5,353
2037	6,413	6,916	5,910	6,978	5,446
2038	6,580	7,101	6,060	7,147	5,546
2039	6,754	7,293	6,216	7,317	5,650
2040	6,936	7,492	6,379	7,492	5,760
2041	7,122	7,696	6,547	7,668	5,874
2042	7,312	7,905	6,720	7,847	5,992
2043	7,508	8,118	6,897	8,029	6,114
2044	7,706	8,334	7,078	8,214	6,239
2045	7,907	8,553	7,261	8,401	6,366

Exhibit B-1

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Statutory Contribution Dollars
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS						
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**
Investment Return Assumption	7.00% per year	Varying Rates for the first 27 years, 7.00% per year thereafter	4.16% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter	5.72% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter
27-Year Geometric Return	7.00%	7.00%	4.16%	4.16%	5.72%	5.72%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 27 years **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with** volatility, based on the System's asset allocation policy
Fiscal Year	**Contribution Dollar Amount ($ in millions)**					
2019	$2,136	$2,136	$2,136	$2,136	$2,136	$2,136
2020	2,291	2,291	2,291	2,291	2,291	2,291
2021	2,410	2,406	2,416	2,409	2,413	2,436
2022	2,525	2,472	2,547	2,524	2,535	2,600
2023	2,562	2,429	2,609	2,591	2,583	2,672
2024	2,606	2,290	2,688	2,639	2,644	2,710
2025	2,650	2,124	2,778	2,696	2,709	2,761
2026	2,703	2,037	2,881	2,783	2,785	2,818
2027	2,759	2,062	2,991	2,904	2,867	2,818
2028	2,814	2,147	3,103	3,001	2,950	2,764
2029	2,875	2,410	3,228	3,195	3,042	2,753
2030	2,935	2,628	3,358	3,462	3,137	2,700
2031	3,001	2,697	3,499	3,721	3,240	2,691
2032	3,074	2,673	3,655	3,901	3,355	2,645
2033	3,156	2,545	3,827	4,104	3,482	2,694
2034	3,476	2,652	4,310	4,587	3,886	3,170
2035	3,564	2,866	4,511	4,636	4,032	3,550
2036	3,654	3,240	4,725	4,777	4,188	3,849
2037	3,748	3,576	4,958	5,058	4,355	4,371
2038	3,846	4,226	5,215	5,202	4,536	4,803
2039	3,947	4,691	5,501	5,448	4,736	4,866
2040	4,054	4,858	5,826	5,728	4,958	4,727
2041	4,162	4,897	6,201	5,814	5,208	4,765
2042	4,274	4,938	6,648	5,926	5,497	5,227
2043	4,388	4,450	7,220	6,315	5,850	6,292
2044	4,504	3,979	8,026	6,100	6,327	8,543
2045	4,621	6,037	9,536	7,093	7,161	11,375
Total Cont. Through 2045	**$88,735**	**$85,757**	**$116,684**	**$111,041**	**$102,903**	**$105,027**
Present Value of Total Cont.	**$36,404**	**$33,902**	**$43,414**	**$42,447**	**$39,918**	**$39,440**

Exhibit B-2

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Statutory Contribution as a Percent of Pay
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS						
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**
Investment Return Assumption	7.00% per year	Varying Rates for the first 27 years, 7.00% per year thereafter	4.16% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter	5.72% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter
27-Year Geometric Return	7.00%	7.00%	4.16%	4.16%	5.72%	5.72%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 27 years **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with** volatility, based on the System's asset allocation policy
Fiscal Year	**Contribution as a Percent of Payroll**					
2019	49.59%	49.59%	49.59%	49.59%	49.59%	49.59%
2020	52.15%	52.15%	52.15%	52.15%	52.15%	52.15%
2021	53.75%	53.65%	53.89%	53.72%	53.81%	54.32%
2022	55.23%	54.07%	55.71%	55.20%	55.45%	56.87%
2023	54.95%	52.11%	55.96%	55.58%	55.41%	57.32%
2024	54.82%	48.18%	56.56%	55.51%	55.62%	57.01%
2025	54.68%	43.84%	57.33%	55.64%	55.90%	56.98%
2026	54.67%	41.20%	58.26%	56.29%	56.33%	56.99%
2027	54.66%	40.85%	59.24%	57.52%	56.80%	55.82%
2028	54.57%	41.65%	60.19%	58.20%	57.21%	53.61%
2029	54.51%	45.70%	61.21%	60.57%	57.68%	52.20%
2030	54.39%	48.69%	62.21%	64.15%	58.12%	50.02%
2031	54.29%	48.79%	63.29%	67.31%	58.61%	48.68%
2032	54.29%	47.21%	64.54%	68.89%	59.25%	46.70%
2033	54.40%	43.87%	65.96%	70.74%	60.03%	46.43%
2034	58.44%	44.59%	72.48%	77.13%	65.34%	53.31%
2035	58.44%	47.00%	73.96%	76.02%	66.12%	58.21%
2036	58.44%	51.82%	75.57%	76.40%	66.97%	61.55%
2037	58.44%	55.77%	77.31%	78.87%	67.90%	68.16%
2038	58.44%	64.21%	79.24%	79.05%	68.94%	72.99%
2039	58.44%	69.46%	81.44%	80.66%	70.11%	72.05%
2040	58.44%	70.04%	83.99%	82.59%	71.49%	68.16%
2041	58.44%	68.76%	87.06%	81.64%	73.12%	66.90%
2042	58.44%	67.53%	90.92%	81.04%	75.18%	71.49%
2043	58.44%	59.27%	96.16%	84.12%	77.92%	83.80%
2044	58.44%	51.63%	104.15%	79.15%	82.10%	110.85%
2045	58.44%	76.35%	120.60%	89.71%	90.56%	143.86%

Exhibit B-3

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Funded Ratio
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS						
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**
Investment Return Assumption	7.00% per year	Varying Rates for the first 27 years, 7.00% per year thereafter	4.16% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter	5.72% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter
27-Year Geometric Return	7.00%	7.00%	4.16%	4.16%	5.72%	5.72%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 27 years **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with** volatility, based on the System's asset allocation policy
Fiscal Year	**Funded Ratio**					
2019	37.04%	37.17%	36.84%	37.08%	36.95%	36.26%
2020	37.93%	39.45%	37.27%	37.97%	37.63%	35.71%
2021	39.37%	43.07%	38.03%	38.57%	38.76%	36.18%
2022	40.58%	49.00%	38.35%	39.68%	39.56%	37.61%
2023	41.69%	55.20%	38.37%	40.48%	40.16%	38.65%
2024	42.74%	59.31%	38.35%	40.78%	40.71%	39.75%
2025	43.76%	60.58%	38.30%	40.44%	41.22%	42.10%
2026	44.76%	60.31%	38.26%	40.62%	41.71%	45.45%
2027	45.76%	56.66%	38.23%	39.18%	42.20%	47.93%
2028	46.76%	53.98%	38.22%	36.56%	42.69%	50.97%
2029	47.79%	54.42%	38.28%	34.51%	43.22%	53.21%
2030	48.85%	56.77%	38.40%	34.27%	43.79%	55.96%
2031	49.96%	60.83%	38.61%	34.21%	44.43%	57.28%
2032	51.14%	63.11%	38.94%	34.82%	45.15%	55.93%
2033	52.42%	62.30%	39.43%	37.47%	46.00%	53.05%
2034	54.18%	59.93%	40.57%	39.80%	47.41%	51.98%
2035	56.10%	58.49%	41.96%	40.85%	49.02%	49.34%
2036	58.20%	54.89%	43.63%	43.61%	50.86%	48.34%
2037	60.51%	53.78%	45.63%	46.08%	52.96%	51.49%
2038	63.05%	56.17%	48.01%	48.79%	55.38%	56.86%
2039	65.85%	60.21%	50.85%	53.35%	58.16%	61.20%
2040	68.95%	64.60%	54.23%	58.37%	61.37%	63.34%
2041	72.38%	71.21%	58.26%	62.72%	65.09%	63.79%
2042	76.17%	77.44%	63.09%	69.33%	69.40%	63.06%
2043	80.35%	79.23%	68.94%	74.86%	74.45%	65.79%
2044	84.95%	83.06%	76.21%	79.92%	80.45%	72.83%
2045	90.00%	87.83%	86.01%	84.97%	88.00%	86.96%

Exhibit B-4

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Unfunded Actuarial Accrued Liability
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS						
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**
Investment Return Assumption	7.00% per year	Varying Rates for the first 27 years, 7.00% per year thereafter	4.16% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter	5.72% per year for the first 27 years, 7.00% per year thereafter	Varying Rates for the first 27 years, 7.00% per year thereafter
27-Year Geometric Return	7.00%	7.00%	4.16%	4.16%	5.72%	5.72%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 27 years **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 25th percentile return **with** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with no** volatility, based on the System's asset allocation policy	Investment returns during the first 27 years represent the 40th percentile return **with** volatility, based on the System's asset allocation policy
Fiscal Year	**Unfunded Accrued Liability ($ in millions)**					
2019	$31,169	$31,107	$31,268	$31,152	$31,214	$31,555
2020	31,693	30,914	32,026	31,669	31,844	32,823
2021	31,874	29,927	32,578	32,294	32,194	33,547
2022	32,108	27,560	33,316	32,598	32,661	33,712
2023	32,335	24,840	34,175	33,003	33,181	34,016
2024	32,520	23,110	35,017	33,633	33,676	34,223
2025	32,658	22,895	35,829	34,589	34,136	33,624
2026	32,738	23,526	36,594	35,193	34,549	32,333
2027	32,752	26,172	37,300	36,723	34,904	31,439
2028	32,701	28,263	37,943	38,968	35,199	30,117
2029	32,573	28,435	38,505	40,855	35,421	29,190
2030	32,367	27,356	38,978	41,590	35,565	27,870
2031	32,073	25,102	39,345	42,169	35,616	27,380
2032	31,676	23,918	39,583	42,257	35,556	28,572
2033	31,162	24,690	39,667	40,950	35,365	30,750
2034	30,276	26,476	39,268	39,780	34,751	31,728
2035	29,233	27,643	38,651	39,394	33,952	33,736
2036	28,020	30,240	37,788	37,805	32,945	34,634
2037	26,623	31,159	36,653	36,347	31,710	32,699
2038	25,027	29,687	35,211	34,682	30,221	29,217
2039	23,219	27,056	33,420	31,717	28,447	26,379
2040	21,180	24,148	31,224	28,394	26,349	25,005
2041	18,894	19,696	28,553	25,505	23,881	24,767
2042	16,344	15,474	25,314	21,031	20,983	25,333
2043	13,510	14,279	21,352	17,284	17,565	23,518
2044	10,371	11,668	16,392	13,831	13,469	18,715
2045	6,906	8,405	9,659	10,380	8,286	9,004

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Statutory Contribution Dollars
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS					
Scenario	**Baseline**	**6**	**7**	**8**	**9**
Investment Return Assumption	7.00% per year	7.00% per year	7.00% per year	7.00% per year	7.00% per year
Wage Inflation Assumption	3.00%	3.00%	3.00%	4.00%	2.00%
Population Growth Assumption	Active population remains constant at 61,397 members through the projection period	Active population increases 1,000 members each year for 5 years and then remains constant at 66,397 members for fiscal years on and after fiscal year 2024	Active population decreases 1,000 members each year for 5 years and then remains constant at 56,397 members for fiscal years on and after fiscal year 2024	Active population remains constant at 61,397 members through the projection period	Active population remains constant at 61,397 members through the projection period
Fiscal Year	**Contribution Dollar Amount ($ in millions)**				
2019	$2,136	$2,136	$2,136	$2,136	$2,136
2020	2,291	2,291	2,291	2,291	2,291
2021	2,410	2,317	2,516	2,404	2,518
2022	2,525	2,464	2,597	2,544	2,608
2023	2,562	2,533	2,596	2,604	2,618
2024	2,606	2,612	2,601	2,671	2,637
2025	2,650	2,661	2,640	2,737	2,655
2026	2,703	2,718	2,688	2,811	2,681
2027	2,759	2,779	2,739	2,889	2,709
2028	2,814	2,838	2,789	2,963	2,736
2029	2,875	2,904	2,845	3,044	2,768
2030	2,935	2,968	2,901	3,123	2,798
2031	3,001	3,038	2,961	3,204	2,833
2032	3,074	3,115	3,030	3,292	2,874
2033	3,156	3,201	3,107	3,384	2,923
2034	3,476	3,525	3,422	3,713	3,210
2035	3,564	3,618	3,506	3,807	3,264
2036	3,654	3,712	3,592	3,900	3,320
2037	3,748	3,810	3,680	3,994	3,378
2038	3,846	3,912	3,774	4,091	3,440
2039	3,947	4,018	3,871	4,189	3,505
2040	4,054	4,128	3,973	4,288	3,573
2041	4,162	4,240	4,077	4,390	3,644
2042	4,274	4,355	4,185	4,492	3,717
2043	4,388	4,472	4,295	4,596	3,792
2044	4,504	4,591	4,408	4,702	3,870
2045	4,621	4,712	4,522	4,809	3,949
Total Cont. Through 2045	**$88,735**	**$89,668**	**$87,742**	**$93,068**	**$82,447**
Present Value of Total Cont.	**$36,404**	**$36,582**	**$36,227**	**$37,881**	**$34,893**

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Statutory Contribution as a Percent of Pay
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS					
Scenario	**Baseline**	**6**	**7**	**8**	**9**
Investment Return Assumption	7.00% per year	7.00% per year	7.00% per year	7.00% per year	7.00% per year
Wage Inflation Assumption	3.00%	3.00%	3.00%	4.00%	2.00%
Population Growth Assumption	Active population remains constant at 61,397 members through the projection period	Active population increases 1,000 members each year for 5 years and then remains constant at 66,397 members for fiscal years on and after fiscal year 2024	Active population decreases 1,000 members each year for 5 years and then remains constant at 56,397 members for fiscal years on and after fiscal year 2024	Active population remains constant at 61,397 members through the projection period	Active population remains constant at 61,397 members through the projection period
Fiscal Year	**Contribution as a Percent of Payroll**				
2019	49.59%	49.59%	49.59%	49.59%	49.59%
2020	52.15%	51.55%	52.77%	51.66%	52.65%
2021	53.75%	50.47%	57.50%	52.60%	57.24%
2022	55.23%	51.98%	58.94%	54.11%	58.70%
2023	54.95%	51.76%	58.59%	53.87%	58.35%
2024	54.82%	51.69%	58.41%	53.78%	58.19%
2025	54.68%	51.57%	58.25%	53.67%	58.01%
2026	54.67%	51.55%	58.22%	53.68%	57.95%
2027	54.66%	51.55%	58.21%	53.69%	57.91%
2028	54.57%	51.48%	58.11%	53.63%	57.78%
2029	54.51%	51.42%	58.04%	53.59%	57.68%
2030	54.39%	51.31%	57.90%	53.49%	57.50%
2031	54.29%	51.22%	57.79%	53.41%	57.35%
2032	54.29%	51.23%	57.79%	53.42%	57.32%
2033	54.40%	51.33%	57.90%	53.53%	57.40%
2034	58.44%	55.09%	62.27%	57.24%	62.02%
2035	58.44%	55.09%	62.27%	57.24%	62.02%
2036	58.44%	55.09%	62.27%	57.24%	62.02%
2037	58.44%	55.09%	62.27%	57.24%	62.02%
2038	58.44%	55.09%	62.27%	57.24%	62.02%
2039	58.44%	55.09%	62.27%	57.24%	62.02%
2040	58.44%	55.09%	62.27%	57.24%	62.02%
2041	58.44%	55.09%	62.27%	57.24%	62.02%
2042	58.44%	55.09%	62.27%	57.24%	62.02%
2043	58.44%	55.09%	62.27%	57.24%	62.02%
2044	58.44%	55.09%	62.27%	57.24%	62.02%
2045	58.44%	55.09%	62.27%	57.24%	62.02%

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Funded Ratio
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS					
Scenario	**Baseline**	**6**	**7**	**8**	**9**
Investment Return Assumption	7.00% per year	7.00% per year	7.00% per year	7.00% per year	7.00% per year
Wage Inflation Assumption	3.00%	3.00%	3.00%	4.00%	2.00%
Population Growth Assumption	Active population remains constant at 61,397 members through the projection period	Active population increases 1,000 members each year for 5 years and then remains constant at 66,397 members for fiscal years on and after fiscal year 2024	Active population decreases 1,000 members each year for 5 years and then remains constant at 56,397 members for fiscal years on and after fiscal year 2024	Active population remains constant at 61,397 members through the projection period	Active population remains constant at 61,397 members through the projection period
Fiscal Year	**Funded Ratio**				
2019	37.04%	37.04%	37.04%	36.40%	37.65%
2020	37.93%	37.93%	37.92%	37.20%	38.62%
2021	39.37%	39.18%	39.58%	38.54%	40.37%
2022	40.58%	40.27%	40.94%	39.68%	41.86%
2023	41.69%	41.31%	42.12%	40.75%	43.21%
2024	42.74%	42.36%	43.20%	41.80%	44.48%
2025	43.76%	43.37%	44.22%	42.84%	45.68%
2026	44.76%	44.37%	45.22%	43.89%	46.84%
2027	45.76%	45.38%	46.22%	44.95%	47.96%
2028	46.76%	46.39%	47.21%	46.04%	49.07%
2029	47.79%	47.43%	48.22%	47.18%	50.17%
2030	48.85%	48.52%	49.26%	48.37%	51.28%
2031	49.96%	49.65%	50.35%	49.62%	52.41%
2032	51.14%	50.86%	51.50%	50.95%	53.59%
2033	52.42%	52.18%	52.74%	52.38%	54.83%
2034	54.18%	53.98%	54.47%	54.28%	56.54%
2035	56.10%	55.93%	56.35%	56.33%	58.39%
2036	58.20%	58.07%	58.41%	58.55%	60.38%
2037	60.51%	60.41%	60.67%	60.95%	62.56%
2038	63.05%	62.99%	63.17%	63.57%	64.94%
2039	65.85%	65.83%	65.93%	66.42%	67.55%
2040	68.95%	68.96%	68.99%	69.54%	70.43%
2041	72.38%	72.42%	72.39%	72.94%	73.61%
2042	76.17%	76.22%	76.15%	76.66%	77.13%
2043	80.35%	80.40%	80.32%	80.73%	81.01%
2044	84.95%	84.98%	84.92%	85.16%	85.29%
2045	90.00%	90.00%	90.00%	90.00%	90.00%

State Employees' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Unfunded Actuarial Accrued Liability
Based on Actuarial Valuation as of June 30, 2018

Illinois SERS					
Scenario	**Baseline**	**6**	**7**	**8**	**9**
Investment Return Assumption	7.00% per year	7.00% per year	7.00% per year	7.00% per year	7.00% per year
Wage Inflation Assumption	3.00%	3.00%	3.00%	4.00%	2.00%
Population Growth Assumption	Active population remains constant at 61,397 members through the projection period	Active population increases 1,000 members each year for 5 years and then remains constant at 66,397 members for fiscal years on and after fiscal year 2024	Active population decreases 1,000 members each year for 5 years and then remains constant at 56,397 members for fiscal years on and after fiscal year 2024	Active population remains constant at 61,397 members through the projection period	Active population remains constant at 61,397 members through the projection period
Fiscal Year	**Unfunded Accrued Liability ($ in millions)**				
2019	$31,169	$31,169	$31,169	$32,042	$30,365
2020	31,693	31,694	31,691	32,686	30,776
2021	31,874	31,976	31,760	33,007	30,722
2022	32,108	32,287	31,906	33,368	30,726
2023	32,335	32,564	32,075	33,708	30,731
2024	32,520	32,769	32,234	33,993	30,701
2025	32,658	32,926	32,350	34,217	30,636
2026	32,738	33,024	32,410	34,369	30,524
2027	32,752	33,053	32,406	34,438	30,358
2028	32,701	33,015	32,339	34,426	30,142
2029	32,573	32,898	32,198	34,320	29,865
2030	32,367	32,702	31,981	34,119	29,530
2031	32,073	32,416	31,679	33,813	29,128
2032	31,676	32,024	31,276	33,387	28,646
2033	31,162	31,512	30,758	32,829	28,074
2034	30,276	30,628	29,874	31,887	27,159
2035	29,233	29,582	28,834	30,776	26,120
2036	28,020	28,364	27,627	29,484	24,943
2037	26,623	26,960	26,241	28,000	23,622
2038	25,027	25,353	24,659	26,309	22,142
2039	23,219	23,531	22,868	24,401	20,493
2040	21,180	21,475	20,851	22,258	18,661
2041	18,894	19,168	18,590	19,867	16,633
2042	16,344	16,594	16,069	17,211	14,393
2043	13,510	13,732	13,270	14,272	11,929
2044	10,371	10,563	10,170	11,029	9,220
2045	6,906	7,064	6,748	7,463	6,250