Judges' Retirement System of Illinois

Annual Actuarial Valuation
as of June 30, 2023

GRS

December 20, 2023

Board of Trustees
Judges' Retirement System of Illinois
Springfield, Illinois

Re: Judges' Retirement System of Illinois Actuarial Valuation as of June 30, 2023

Dear Board Members:

The results of the June 30, 2023, Annual Actuarial Valuation of the Judges' Retirement System of Illinois ("JRS" 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, 2024, and ending June 30, 2025. 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 Judges' 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 JRS only in its entirety and only with the permission of the Board of Trustees.

The State's contribution rate has been determined under Illinois statutes, in particular under 40 ILCS Section 5/18-131. Information required by the Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 is 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 a 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 finances 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 methods and assumptions disclosed in Section E of this report. This report includes risk metrics beginning on page 13, 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.

Board of Trustees
Judges' Retirement System of Illinois
December 20, 2023
Page 2

The findings in this report are based on data and other information through June 30, 2023. The actuarial valuation was based upon information furnished by JRS 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 JRS staff.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation, and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

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, 2023, actuarial valuation are based on an experience review for the three-year period from July 1, 2018, through June 30, 2021. Pursuant to Public Act 99-0232, JRS is required to conduct an actuarial experience review once every three years. 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 the Section E of this 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. 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 JRS 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, Heidi G. Barry, and Jeffrey T. Tebeau 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 opinions contained herein.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

Alex Rivera, FSA, EA, FCA, MAAA   Heidi G. Barry, ASA, FCA, MAAA   Jeffrey T. Tebeau, FSA, EA, FCA, MAAA
Senior Consultant   Senior Consultant   Senior Consultant

Table of Contents

SECTION A

SUMMARY OF ACTUARIAL VALUATION RESULTS

Introduction

The law governing the Judges' Retirement System of Illinois ("JRS" 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, an annual determination of the amount of the required State contributions and certify the results thereof to the board (40 ILCS Section 5/18-152 (2))."

Gabriel, Roeder, Smith & Company has been retained by the Board of Trustees to perform an actuarial valuation as of June 30, 2023. 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 fiscal year ending June 30, 2025.

The actuarial valuation was completed based upon membership and financial data provided by the administrative staff of the System. The actuarial assumptions used were based on an experience review for the three-year period ending June 30, 2021. The cost method used to determine the benefit liabilities 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 Last Valuation

Recent Legislative Changes

The following recently passed Public Acts impact JRS as follows:

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 fiscal year 2018 State contribution was recertified, pursuant to P.A. 100-0023. A summary of the JRS plan provisions is included in Section F of this report.

Assumptions and Methods

The actuarial valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The actuarial assumptions used for the June 30, 2023, actuarial valuation are based on an experience review for the three-year period from July 1, 2018, through June 30, 2021.

There have been no changes to the actuarial assumptions and methods since the June 30, 2022, actuarial valuation.

Pursuant to Public Act 99-0232, GARS is required to conduct an actuarial experience review once every three years.

Key Valuation Results

A summary of the key actuarial valuation results for the current and prior plan years is noted below:

Actuarial Valuation Date:	June 30, 2023	June 30, 2022
Fiscal Year Ending:	**June 30, 2025**	**June 30, 2024**
Estimated Statutory Contributions		
· Annual Amount	$ 148,889,000	$ 147,838,000
· Percentage of Projected Capped Payroll for Fiscal Year	95.871%	95.600%
Actuarially Determined Contribution[a] (ADC)		
· Annual Amount	$ 178,592,396	$ 174,674,767
· Percentage of Projected Capped Payroll for Fiscal Year	114.997%	112.954%
Membership		
· Number of		
- Active Members	953	940
- Members Receiving Payments	1,378	1,323
- Inactive Members	25	24
- Total	2,356	2,287
· Covered Uncapped Payroll Provided by System	$ 209,521,112	$ 200,340,014
· Projected Capped Payroll For Fiscal Year	$ 155,301,589	$ 154,641,902
· Annualized Benefit Payments	$ 196,832,256	$ 183,655,164
Assets		
· Market Value of Assets (MVA)	$ 1,325,897,864	$ 1,280,555,922
· Actuarial Value of Assets (AVA)	$ 1,357,082,191	$ 1,309,800,342
· Return on MVA	6.33%	-6.41%
· Return on AVA	6.10%	7.71%
· Ratio – AVA to MVA	102.35%	102.28%
Actuarial Information		
· Employer Normal Cost Amount	$ 28,911,321	$ 31,333,252
· Actuarial Accrued Liability (AAL)	$ 3,041,420,610	$ 2,955,628,361
· Unfunded Actuarial Accrued Liability (UAAL)	$ 1,684,338,419	$ 1,645,828,019
· Funded Ratio based on AVA	44.62%	44.32%
· UAAL as % of Covered Uncapped Payroll	803.90%	821.52%
· Funded Ratio based on MVA	43.59%	43.33%

[a] *For contributions in 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, 2023, applicable for fiscal year 2025, the remaining amortization period is 17 years. The ADC is used for financial reporting purposes only.*

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 $29,189,400 for fiscal year 2006 and $35,236,800 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, 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 46.

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, 2023. 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 6/30/2022	$ 1,280,555,922
1a. Market Value Adjustment	(2,791,648)
1b. Market Value of Assets 6/30/2022 - Adjusted	1,277,764,274
2. Actual State Contribution Amount	147,429,857
3. Employee Contribution Amount	15,006,659
4. Benefit Payouts and Refunds	(193,060,427)
5. Administrative Expenses	(1,075,130)
6. Investment Income	79,832,631
7. Market Value of Assets 6/30/2023	1,325,897,864
8. Expected Investment Return at 6.50%	82,040,677
9. Investment Gain/(Loss) Current Year	(2,208,046)
10. Deferred Investment Gains and (Losses) All Years	(31,184,327)
11. Actuarial Value of Assets 6/30/2023 (7. - 10.)	$ 1,357,082,191

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 was deposited July 1, 2003.

1.	Hypothetical Value of Assets 6/30/2022	$ 1,031,528,772
2.	State Contribution Amount[a]	167,710,164
3.	Employee Contribution Amount	15,006,659
4.	Benefit Payouts and Refunds	(193,060,427)
5.	Administrative Expenses	(1,075,130)
6.	Investment Income[b]	64,939,913
7.	Hypothetical Value of Assets 6/30/2023	1,085,049,951
8.	Expected Investment Return at 6.50%	66,684,103
9.	Investment Gain/(Loss) Current Year	(1,744,190)
10.	Deferred Investment Gains and (Losses) All Years	(25,478,790)
11.	Hypothetical Actuarial Value of Assets 6/30/2023 (7. - 10.)	$ 1,110,528,741

[a] *Represents FY 2023 no POB basic contribution. This amount was determined as part of the June 30, 2021, actuarial valuation 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 2023 of 6.33 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 valuation report GRS has produced since the GOB proceeds were deposited into the trust.

State Contribution Requirement for Fiscal Year 2025

The fiscal year ending June 30, 2024, and June 30, 2025, 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 follows:

Fiscal Year Ending June 30,	Base Contribution Rate	Assumed Capped Payroll	Total Required Contribution
2024	**95.600%**	**$154,642,000**	**$147,838,000**
2025	**95.871%**	**155,302,000**	**148,889,000**
2026	95.584%	155,810,000	148,929,000
2027	95.017%	156,660,000	148,854,000
2028	96.110%	157,474,000	151,348,000
2029	95.732%	158,814,000	152,036,000
2030	95.107%	160,192,000	152,354,000
2031	94.569%	161,756,000	152,971,000
2032	94.418%	163,553,000	154,423,000
2033	94.611%	165,369,000	156,457,000

For fiscal years 2025 through 2033, the base contribution may be 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 2025 contribution rate is calculated assuming the actuarial value of assets as of July 1, 2023, 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 on and after 2024 through 2028 include smoothing of contribution rate variances due to changes in actuarial assumptions.

The contributions for fiscal years 2025 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 2024 through 2027 have been projected as though a valuation in each of those years were performed. At each projected valuation, an additional 20 percent of the investment gains and losses are recognized. The market value of assets at June 30, 2023, is assumed to earn a rate of return equal to the valuation interest rate going forward. Therefore, the actuarial value of assets is calculated by adjusting the market value at each respective valuation date by the remaining percentage of the investment gains and losses. The actuarial value of assets converges to market value in 2027, 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, 2023, actuarial valuation. In order to determine projected contribution rates and amounts, the following additional assumptions were used:

- Projected annualized capped payroll of $154,642,000 for fiscal year 2024.

- Total employer contributions of $147,838,000 for fiscal year 2024.

- Administrative expenses of $1,063,420 for fiscal year 2024, as provided by the System.

- New entrants whose average age is 47.80 and average uncapped pay is $220,041 (2023 dollars) and average capped pay is $134,071 (2023 dollars). The active member population is assumed to remain level at 953 for all years of the 22-year projection.

- 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 22-year projection period is approximately 2.50 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 2.25 percent per year. All results in this valuation assume that State contributions will be made on capped pay.

To determine the contribution rates, the expected 2024 appropriation was converted to a percentage of the expected 2024 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 2024 will be 95.600 percent based on expected total employer contributions of $147,838,000.

- The contribution rates for fiscal years 2034 through 2045 will be a uniform percentage of capped payroll.

- The contribution rates for fiscal years 2024 through 2028 are reduced according to the phase-in schedule provided on page 46.

The certified FY 2025 contribution rate of 95.871 percent is applied to expected FY 2025 capped payroll. The resulting amount of $148,889,000 is budgeted pursuant to the continuing appropriations process and deposited into the System in FY 2025.

Observations on Actuarial Funding and Statutory Funding

GASB Statement 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 Statement Nos. 25 and 27, this expense requirement is called 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 Statement Nos. 67 and 68, which replace GASB Statement 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 funding 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 remaining amortization period as of the June 30, 2023, actuarial valuation is 17 years.

The ADC for fiscal years 2024 and 2025, as well as the statutory contribution for fiscal years 2024 and 2025, are shown below as a percentage of projected capped payroll. The ADC percentage and statutory contribution for 2024 are based on the results of the June 30, 2022, actuarial valuation. The dollar amount of the ADC for 2024 and 2025, and the statutory contribution for 2024 and 2025 will be the product of the actual payroll for 2024 and 2025 and the percentages shown.

Actuarial Valuation Date:	June 30, 2023	June 30, 2022
Actuarially Determined Contributions for Fiscal Year Ending:	**June 30, 2025**	**June 30, 2024**
1. Employer normal cost	$ 28,911,321	$ 31,333,252
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	149,681,075	143,341,515
3. ADC [(1) + (2)]	$ 178,592,396	$ 174,674,767
4. Projected capped payroll for fiscal year	$ 155,301,589	$ 154,641,902
5. ADC as a percentage of projected capped payroll	114.997%	112.954%
6. Estimated statutory contribution	$ 148,889,000	$ 147,838,000
7. Estimated statutory contribution as a percentage of projected capped payroll	95.871%	95.600%
8. Estimated statutory contribution as a percentage of ADC [(6) / (3)]	83.368%	84.636%

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 JRS 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.

Funded Ratio

Valuation Year
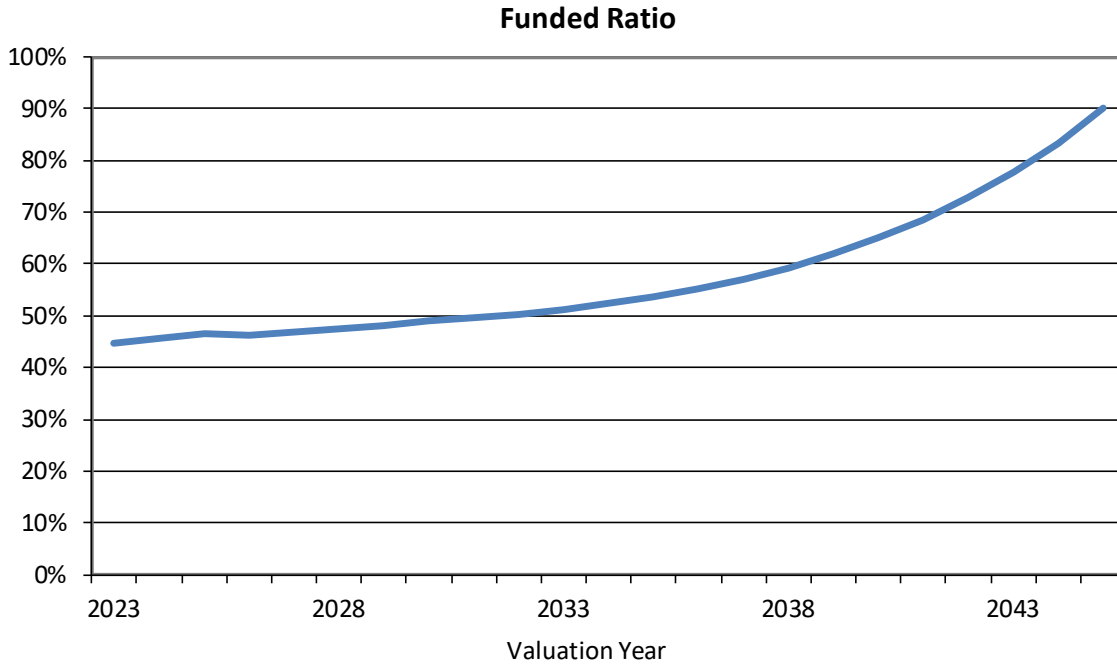
Observations on Actuarial Funding and Statutory Funding

The following graph compares the projected benefits and expenses against employer contributions, employee contributions, and investment income. Benefits and expenses currently exceed State and employee contributions. From 2024 to 2033, the percentage of investment income needed to pay ongoing benefits increases from approximately 53 percent to 94 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 88 percent in 2034 to 15 percent in 2045, which is projected to cause assets to grow at a higher rate.

Comparison of Cash Flows
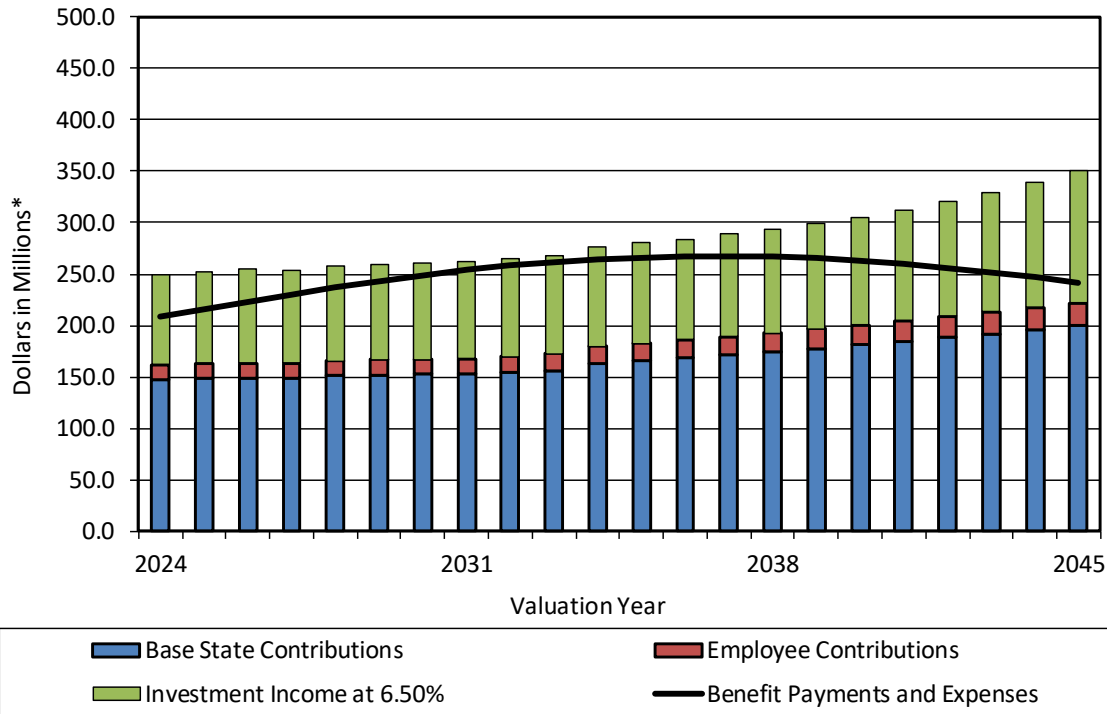
Future dollar amounts are based on assumed inflationary increases.

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

Given that the JRS funded ratio at June 30, 2023, is only 44 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. Examples of methods to strengthen the current funding policy include:

1. Increasing the 90 percent funding target;
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 to the Entry Age Normal method.

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

At the March 27, 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 financing of JRS' 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). Although the number of active members has fluctuated between 2013 and 2023, the active population has remained stable.

Currently, the actuarial valuation assumes that the total number of active members in the future will be equal to the number of active members in the current actuarial valuation. If JRS expects to see a 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 in the long term.

Active Membership				
Fiscal Year Ending June 30,	Total	Annual Change in Membership	% Annual Change in Membership	Uncapped Payroll ($ in Millions)
2013	962			173.02
2014	951	(11)	-1.14%	172.85
2015	961	10	1.05%	177.16
2016	947	(14)	-1.46%	177.99
2017	953	6	0.63%	182.24
2018	936	(17)	-1.78%	182.78
2019	956	20	2.14%	190.74
2020	947	(9)	-0.94%	193.42
2021	944	(3)	-0.32%	197.89
2022	940	(4)	-0.42%	200.34
2023	953	13	1.38%	209.52
Total Change		(9)	-0.09%	

Actuarial Standards of Practice (ASOP) No. 4 Disclosures

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

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

1. The State contribution rate will be level as a percentage of payroll beginning in 2034 through 2045 (after all deferred asset gains and losses are fully recognized);
2. The unfunded liability will continue 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 statutory 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.

Risks Associated with Measuring the Accrued Liability and Required Employer Contribution

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 funding policy provides for a projected funded ratio target of 90 percent at plan year end 2045. Employer contributions are based on a level percentage of projected payroll. This policy spreads investment and demographic gains over the entire projection period. Consequently, statutory contributions depend primarily on the assumptions and methods used to project assets and open group liabilities. The System funded ratio is only 45 percent as of June 30, 2023. For fiscal year 2025, the statutory contribution is $148.9 million and the pro forma actuarial determined contribution is $178.6 million.

Section J of the report identifies and discusses the key risks facing the System and contains stress and sensitivity analysis of those key risks.

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:

Valuation Year	Ratio of the Market Value of Assets to Uncapped Payroll	Ratio of Actuarial Accrued Liability to Uncapped Payroll	Ratio of Unfunded Accrued Liability to Uncapped Payroll	Funded Ratio Market Value Basis
2016	4.72	14.31	9.59	33.00%
2017	5.17	14.54	9.37	35.55%
2018	5.54	14.89	9.35	37.20%
2019	5.63	14.64	9.02	38.42%
2020	5.75	14.73	8.98	39.05%
2021	6.96	14.76	7.80	47.15%
2022	6.39	14.75	8.36	43.33%
2023	6.33	14.52	8.19	43.59%

Valuation Year	Ratio of Actives to Retirees and Beneficiaries	Ratio of Retiree Accrued Liability to Total Accrued Liability	Approximate Duration of Actuarial Accrued Liability	Ratio of Net Cash Flow to Market Value of Assets	Ratio of Benefit Payments and Expenses to Contributions
2016	0.83	69.80%	11.1	1.53%	0.91
2017	0.81	71.67%	10.9	0.39%	0.97
2018	0.78	72.68%	10.7	0.07%	1.00
2019	0.76	74.33%	10.3	-0.38%	1.03
2020	0.74	75.16%	10.2	-0.75%	1.05
2021	0.73	76.43%	10.2	-0.82%	1.07
2022	0.71	77.05%	9.7	-0.92%	1.07
2023	0.69	79.66%	9.6	-2.39%	1.20

Ratio of Market Value of Assets to Payroll

For funding policies that are based on actuarially determined contributions, which are expressed as a percentage of payroll, the ratio of market value of assets to payroll may provide an indicator of the sensitivity in contribution rates due to recent investment experience. However, this sensitivity indicator generally depends on the relative level of liabilities and the funded ratio of the plan.

For example, better funded plans will have lower contribution rates when compared to worst funded plans. However, investment loss will generally have a greater impact on the contribution rates of better funded plans when compared to worst funded plans.

Consequently, as assets increase and the funding ratio improves, investment experience will generally have a greater marginal impact on contribution rates, even though contribution rates may be decreasing.

Ratio of Actuarial Accrued Liability to Payroll

The ratio of actuarial liability to payroll may indicate the maturity of a plan. For example, a closed plan comprised primarily of retired members will generally have a high ratio of liability to payroll. However, for open plans it is important to also measure the unfunded liability relative to payroll.

Risks Associated with Measuring the Accrued Liability and Required Employer Contribution

Ratio of Unfunded Actuarial Liability to Payroll

Plans with high unfunded liabilities relative to payroll could result in unsustainable contribution rates, even though the plan is open. It may also indicate the need to strengthen the funding policy, for example, by reducing the amortization period. The ratio of unfunded actuarial liability to payroll has decreased from 9.59 in 2016 to 8.19 in 2023, which indicates some progress towards financing the unfunded actuarial liability. A decrease in the ratio of unfunded liability to payroll is an indicator that the System is making some progress towards funding the program; however, it could still produce an increasing unfunded liability. This is typical of systems that have back-loaded funding policies.

Funded Ratio

The ratio of actuarial accrued liability provides another metric of progress towards funding. The funded ratio, using the market value of assets, has increased from 33.00 percent in 2016 to 43.59 percent in 2023. Consequently, the System has experienced a positive trend in the funded ratio. However, over the statutory funding projection period, the funded ratio, using the actuarial value of assets, increases at a very slow rate, from 45 percent in 2024, to 51 percent in 2033, to 78 percent in 2043, and to 90 percent in 2045. Consequently, most of the growth in the funded ratio occurs during the last five years of the projection period. See Section B Table 4d for additional details on the statutory funding projections.

Ratio of Actives to Retired Members

A newly established plan, which does not grant past service credits, will have a high ratio of actives to retired members. As the plan matures the ratio approaches 1.0. A very mature plan may have more retired members relative to active members which produce a ratio under 1.0. Very mature plans that have not been adequately funded could produce intergenerational inequities.

The System's ratio of active to retired members is trending downward and has decreased from 0.83 in 2016 to 0.69 in 2023, which suggests that the System is maturing. However, this ratio does not consider that the System is providing a different level of benefits to Tier 1 and Tier 2 members.

Ratio of Retiree Actuarial Accrued Liability to Total Actuarial Accrued Liability

The ratio of retiree actuarial accrued liability to total actuarial accrued liability also provides a measure of the maturity of the plan relative to the level of plan benefits that have been earned to date. This ratio has increased from 70 percent in 2016 to 80 percent for 2023, which suggests that the System is maturing. An increasing ratio could indicate a maturing plan. Some of the reasons for this trend include changes in assumptions, the relative level of Tier 1 to Tier 2 benefits, and the ratio of retired to active members.

As the program matures, it is important to consider the matching of assets to liabilities to ensure intergenerational equity. For example, retiree liabilities that have not been pre-funded during the working lifetime of the retired member could produce intergenerational inequities. As of June 30, 2023, the System's funded ratio, using the actuarial value of assets, is only 45 percent, and 80 percent of total liabilities are attributable to current retirees and beneficiaries.

Risks Associated with Measuring the Accrued Liability and Required Employer Contribution

Duration of Actuarial Accrued Liability

The duration of the actuarial accrued liability may be used to approximate the sensitivity of a one percentage point change in the assumed discount rate. For example, a duration of 10 indicates that the liability could increase by approximately 10 percent if the assumed discount rate was lowered by one percentage point. The duration for active member liabilities is generally higher when compared to the duration for retired members. Consequently, a lower duration generally indicates a greater proportion of retired member liability. Changes to the discount rate assumption could also cause the duration factor to change. For the System, the duration factors have decreased from 11.1 in 2016 to 9.6 in 2023, which suggests a maturing system. Other factors such as emerging experience or changes in assumptions could also impact the year-to-year change in duration.

Ratio of Net Cash Flow to Market Value of Assets and Ratio of Benefit Payments to Contributions

Net cash flow is defined as the difference between total contributions, and benefits and expenses made during the plan year. If benefits and expenses are greater than contributions, a portion of either investment return or principal will be used to pay benefits and expenses during the year. A negative percentage means a decrease in assets, whereas a positive ratio means an increase in assets.

For underfunded plans, it is preferable for this ratio to be positive. This would imply that investment income is maintained in the trust which helps the growth in assets. For the System, the percentage has ranged from 1.53 percent in 2016 to -2.39 percent in 2023. In 2023, about 2.39 percent of plan assets were used to pay benefits. Given the low ratio of assets to liabilities and the high ratio of retiree liabilities to total liabilities, it is preferable if this margin is significantly more than one percent which implies that investment income is not being used to pay benefits.

For sufficiently well-funded plans, it is appropriate for a portion of investment income to be used to pay benefits. In this case, a negative ratio means that assets have grown to a reasonably sufficient level, and can be used to pay benefits.

The ratio of benefit payments and expenses to contributions is closely related to the percentage of net cash flows to the market value of assets. For underfunded plans, it is preferable for contributions to exceed benefit payments, which implies a ratio less than 1.0. The ratio has ranged from 0.91 in 2016 to 1.20 in 2023.

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 sensitivity and stress testing the investment return assumption, future active population growth and changes in the wage inflation assumption. Please see Section J for additional details.

Low-Default-Risk Obligation Measure

Introduction

In December 2021, the Actuarial Standards Board (ASB) adopted a revision to Actuarial Standard of Practice (ASOP) No. 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions. The revised ASOP No. 4 requires the calculation and disclosure of a liability referred to by the ASOP as the "Low-Default-Risk Obligation Measure" (LDROM).

What is the LDROM?

The LDROM is a particular measure of the benefits earned (or costs accrued if appropriate under the actuarial cost method used for this purpose) as of the measurement date.

How is the LDROM Calculated?

The LDROM is calculated using an immediate gain actuarial cost method, one in which gains and losses become part of the unfunded actuarial accrued liabilities. Examples would be Entry Age Normal Cost, Projected Unit Credit, and Traditional Unit Credit. It is based upon a discount rate or discount rates derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future.

What Does the LDROM Tell Me?

The LDROM gives an approximate measure of the cost as of the measurement date of securing benefits by constructing a hypothetical Low Default Risk Bond portfolio whose cash flows match the pattern of benefits expected to be paid in the future. The LDROM is very dependent upon market interest rates at the time of the LDROM measurement. The lower the market interest rates, the higher the LDROM, and vice versa.

Is the LDROM the "right" liability that should be reported?

No single number, including the LDROM can provide all of the information necessary to understand the financial condition of a pension plan. The rationale that the ASB cited for the calculation and disclosure of the LDROM was included in the Transmittal Memorandum of ASOP No. 4 and is presented below (emphasis added):

> "The ASB believes that the calculation and disclosure of this measure provides **appropriate, useful information for the intended user regarding the funded status of a pension plan**. The calculation and disclosure of this additional measure is **not intended to suggest that this is the "right" liability measure** for a pension plan. However, the ASB does believe that **this additional disclosure provides a more complete assessment of a plan's funded status and provides additional information regarding the security of benefits that members have earned as of the measurement date.**"

COMPARING THE ACCRUED LIABILITIES AND THE LDROM

The LDROM results presented in this report are based on the Projected Unit Credit (PUC) actuarial cost method and discount rates based upon the June 2023 (end of month) FTSE Pension Discount Curve (PDC). The PDC is calculated based on a universe of AA rated corporate bonds from the FTSE US Broad Investment-Grade Bond Index (USBIG®) of varying maturities and the yields of the Treasury model curve.

Low-Default-Risk Obligation Measure

Representative 1-, 5-, 10-, 20-, and 30-year annual spot rates as of June 30, 2023 are: 5.76%, 4.64%, 4.68%, 5.22%, and 4.85%, respectively.

The statutory funding actuarial accrued liability is based on the PUC actuarial cost method and discount rate (the expected long-term rate of return on assets) of 6.50%.

Presented below is a comparison of the statutory funding actuarial accrued liability and the LDROM as of June 30, 2023 for JRS:

$ in millions		
Funding Valuation Actuarial Accrued Liability (PUC)	$	3,041
LDROM (PUC)		3,596
Difference		(555)

The difference between the statutory funding actuarial accrued liability and the LDROM illustrates the potential present value of future contribution savings due to investing in a well-diversified portfolio, consistent with the long-term investment return assumption, instead of a hypothetical low default risk bond portfolio.

Since plan assets are actually invested in a well-diversified portfolio and not a low-default-risk fixed bond portfolio, LDROM does not provide relevant information on the funded status or statutory contribution requirements. Benefit security for members of the plan relies on a combination of the current assets in the plan, the future investment returns generated on those assets, and the promise of future contributions from the plan sponsor.

The LDROM liability contained in this report was provided solely to comply with the requirements of ASOP 4 section 3.11 and should not be used for any other purpose. This measure is not appropriate for assessing the need for or amount of future contributions. This measure is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

SECTION B

FUNDING RESULTS

Table 1
Results of Actuarial Valuation as of June 30, 2023

1	Number of Members		
	a. Active		953
	b. Inactive:		
	i. Eligible for deferred vested pension benefits		8
	ii. Eligible for return of contributions only		17
	c. Current Benefit Recipients:		
	i. Retirement annuities		1,019
	ii. Disabilities		-
	iii. Survivor annuities*		359
	d. Total		2,356
2	Covered Uncapped Payroll as of Valuation Date	$	209,521,112
3	Annualized Benefit Payments Currently Being Made		
	a. Retirement	$	164,783,748
	b. Disability		-
	c. Survivor*		32,048,508
	d. Total	$	196,832,256
4	Actuarial Liability—Annuitants		
	a. Current Benefit Recipients:		
	i. Retirement annuities	$	2,125,686,656
	ii. Disability annuities		-
	iii. Survivor annuities*		297,202,972
	b. Total	$	2,422,889,629

* *Includes 30 alternate payees resulting from QILDROs and one retired member who is also receiving a survivor annuity.*

Table 1 (Concluded)
Results of Actuarial Valuation as of June 30, 2023

		Normal Cost	Actuarial Liability
5	Actuarial Liability—Inactive Members		$ 6,671,859
6	Active Members		
	a. Pension Benefits	$ 31,376,947	$ 458,894,809
	b. Cost-of-Living Adjustments	8,924,916	137,466,280
	c. Death Benefits	931,681	9,486,234
	d. Disability	-	-
	e. Withdrawal	879,963	6,011,799
	f. Expenses	1,063,420	-
	g. Total	$ 43,176,927	$ 611,859,122
7	Total Actuarial Liability (4 + 5 + 6)		$ 3,041,420,610
8	Market Value of Assets (MVA)		$ 1,325,897,864
9	Unfunded Actuarial Liability Based on MVA (7 − 8)		$ 1,715,522,746
10	Funded Percentage Based on MVA (8 ÷ 7)		43.59%
11	Actuarial Value of Assets (AVA)		$ 1,357,082,191
12	Unfunded Actuarial Liability Based on AVA (7 − 11)		$ 1,684,338,419
13	Funded Percentage Based on AVA (11 ÷ 7) [a]		44.62%
14	Total Normal Cost	$ 43,176,927	
15	Employee Contributions	$ 14,265,606	
16	Annual Employer Normal Cost	$ 28,911,321	
	(% uncapped payroll)	13.80%	

[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 valuation results. The increase in the unfunded accrued actuarial liability ("UAAL") of $38,510,400 was due to the following:

1	UAAL at 06/30/2022		$	1,645,828,019
2	Contributions			
	a.	Contributions due (Normal Cost plus Interest on UAAL)		
		i Interest on 1)	$	106,978,821
		ii Members Contributions		15,006,659
		iii Employer Normal Cost		31,333,252
		iv Interest on ii and iii		1,482,338
		v Total Due	$	154,801,070
	b.	Contributions paid (Actual)		
		i Member Contributions	$	15,006,659
		ii State Agencies		147,429,857
		iii Interest on i and ii		5,196,080
		iv Total Paid	$	167,632,596
	c.	Expected Increase in UAAL	$	(12,831,526)
3	Expected UAAL at 6/30/2023		$	1,632,996,493
4	(Gains)/Losses			
	a. Investment Income		$	5,142,132
	b. Demographic			46,199,794
	c. Total		$	51,341,926
5	Plan Provision Changes		$	-
6	Assumption Changes		$	-
7	Total Change in UAAL		$	38,510,400
8	UAAL at 6/30/2023		$	1,684,338,419

Table 3
Analysis of Financial Gains and Losses in Unfunded Accrued Actuarial Liability for Fiscal Year Ended June 30, 2023

	Activity	(Gain)/Loss	% of 6/30/2022 AAL
1	Actuarial (Gain)/Loss		
	a. Retirements	$ 38,850,976	1.31%
	b. Incidence of Disability	-	0.00%
	c. In-Service Mortality	101,038	0.00%
	d. Retiree Mortality and Benefit Changes	(3,873,289)	-0.13%
	e. Salary Increases	9,826,835	0.33%
	f. Terminations	490,236	0.02%
	g. Investment	5,142,132	0.17%
	h. New Entrant Liability	1,105,054	0.04%
	i. Data/Method Changes	-	0.00%
	j. Other	(301,056)	-0.01%
	k. Total Actuarial (Gain)/Loss	$ 51,341,926	1.73%
2	Plan Provision Changes	$ -	0.00%
3	Assumption Changes	$ -	0.00%
4	Contribution (Excess)/Shortfall[a]	$ (12,831,526)	-0.43%
5	Total Financial (Gain)/Loss	$ 38,510,400	1.30%

[a] *Represents the increase/(decrease) in the Unfunded Actuarial Accrued Liability due to actual contributions being less/(more) 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 94-0004, Public Act 96-0043, and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% 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	
2024	953	$3,068.77	$1,154.44	$1,914.33	37.62%	$154.64	$43.18	$14.27	$28.91	18.70%	$166.58	107.72%	$208.24
2025	953	3,088.93	1,195.10	1,893.83	38.69%	155.30	41.74	14.54	27.20	17.51%	167.64	107.95%	215.49
2026	953	3,101.45	1,230.90	1,870.55	39.69%	155.81	40.45	14.70	25.75	16.53%	167.59	107.56%	222.87
2027	953	3,105.30	1,261.52	1,843.78	40.62%	156.66	38.77	14.63	24.14	15.41%	167.90	107.17%	230.38
2028	953	3,101.66	1,287.53	1,814.13	41.51%	157.47	37.73	14.43	23.30	14.80%	168.17	106.79%	236.85
2029	953	3,090.13	1,310.23	1,779.90	42.40%	158.81	36.68	14.50	22.18	13.97%	169.60	106.79%	243.20
2030	953	3,071.26	1,330.26	1,741.00	43.31%	160.19	36.02	14.76	21.26	13.27%	171.07	106.79%	248.94
2031	953	3,045.61	1,348.26	1,697.35	44.27%	161.76	35.56	14.78	20.78	12.85%	172.74	106.79%	253.86
2032	953	3,013.02	1,365.05	1,647.97	45.31%	163.55	35.22	15.31	19.91	12.17%	174.66	106.79%	258.63
2033	953	2,974.90	1,382.07	1,592.83	46.46%	165.37	35.24	15.87	19.37	11.71%	176.60	106.79%	261.95
2034	953	2,931.51	1,400.49	1,531.02	47.77%	167.68	35.24	16.39	18.85	11.24%	179.06	106.79%	264.65
2035	953	2,883.77	1,421.65	1,462.12	49.30%	170.13	35.44	16.95	18.49	10.87%	181.69	106.79%	266.35
2036	953	2,832.21	1,446.70	1,385.51	51.08%	172.86	35.73	17.46	18.27	10.57%	184.60	106.79%	267.33
2037	953	2,777.43	1,476.85	1,300.58	53.17%	175.70	36.09	18.01	18.08	10.29%	187.64	106.79%	267.55
2038	953	2,720.15	1,513.49	1,206.66	55.64%	178.77	36.53	18.55	17.98	10.06%	190.92	106.79%	266.98

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 (Concluded)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0004, Public Act 96-0043, and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year ($ in Millions)

Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Annual Normal Cost Total	Employee Cont.	Employer Normal Cost	Percent of Pay	State Contribution Amount	Percent of Pay	Total Expenses
2039	953	$2,661.19	$1,558.14	$1,103.05	58.55%	$182.02	$37.08	$19.09	$17.99	9.88%	$194.38	106.79%	$265.54
2040	953	2,601.38	1,612.41	988.97	61.98%	185.49	37.68	19.61	18.07	9.74%	198.08	106.79%	263.25
2041	953	2,541.84	1,678.13	863.71	66.02%	189.10	38.41	20.14	18.27	9.66%	201.95	106.79%	259.96
2042	953	2,482.99	1,756.73	726.26	70.75%	192.91	39.07	20.66	18.41	9.54%	206.01	106.79%	256.21
2043	953	2,425.82	1,849.97	575.85	76.26%	196.79	39.85	21.19	18.66	9.48%	210.15	106.79%	251.64
2044	953	2,370.86	1,959.48	411.38	82.65%	200.87	40.61	21.72	18.89	9.40%	214.51	106.79%	246.65
2045	953	2,318.65	2,086.81	231.84	90.00%	205.07	41.36	22.26	19.10	9.31%	219.00	106.79%	241.28

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 94-0002, Public Act 94-0004, Public Act 96-0043, and Public Act 100-0023
Investment Return of 6.50% Each Year ($ in Millions)

Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Annual Normal Cost				Required State Contribution				Minimum of (c) and (d)		Total Expenses
							Total	Employee Cont.	Employer Normal Cost	Percent of Pay	(a) Without GOB Cont.	(b) Debt Service	(c)=(a)-(b) Maximum Cont.	(d) Formula Rate With GOB	Required Cont.	Percent of Pay	
2024	953	$3,068.77	$1,397.68	$1,671.09	45.55%	$154.64	$43.18	$14.27	$28.91	18.70%	$166.58	$16.30	$150.28	$147.84	$147.84	95.60%	$208.24
2025	953	3,088.93	1,434.80	1,654.13	46.45%	155.30	41.74	14.54	27.20	17.51%	167.64	17.31	150.33	148.89	148.89	95.87%	215.49
2026	953	3,101.45	1,466.77	1,634.68	47.29%	155.81	40.45	14.70	25.75	16.53%	167.59	17.76	149.83	148.78	148.78	95.49%	222.87
2027	953	3,105.30	1,493.21	1,612.09	48.09%	156.66	38.77	14.63	24.14	15.41%	167.90	18.16	149.74	148.99	148.99	95.10%	230.38
2028	953	3,101.66	1,514.66	1,587.00	48.83%	157.47	37.73	14.43	23.30	14.80%	168.17	19.00	149.17	149.16	149.16	94.72%	236.85
2029	953	3,090.13	1,531.73	1,558.40	49.57%	158.81	36.68	14.50	22.18	13.97%	169.60	19.76	149.84	150.43	149.84	94.35%	243.20
2030	953	3,071.26	1,544.55	1,526.71	50.29%	160.19	36.02	14.76	21.26	13.27%	171.07	20.93	150.14	151.73	150.14	93.72%	248.94
2031	953	3,045.61	1,553.77	1,491.84	51.02%	161.76	35.56	14.78	20.78	12.85%	172.74	22.01	150.73	153.21	150.73	93.19%	253.86
2032	953	3,013.02	1,560.70	1,452.32	51.80%	163.55	35.22	15.31	19.91	12.17%	174.66	22.50	152.16	154.92	152.16	93.04%	258.63
2033	953	2,974.90	1,567.29	1,407.61	52.68%	165.37	35.24	15.87	19.37	11.71%	176.60	22.43	154.17	156.64	154.17	93.23%	261.95
2034	953	2,931.51	1,576.86	1,354.65	53.79%	167.68	35.24	16.39	18.85	11.24%	179.06	0.00	N/A	158.82	158.82	94.72%	264.65
2035	953	2,883.77	1,588.29	1,295.48	55.08%	170.13	35.44	16.95	18.49	10.87%	181.69	0.00	N/A	161.15	161.15	94.72%	266.35
2036	953	2,832.21	1,602.64	1,229.57	56.59%	172.86	35.73	17.46	18.27	10.57%	184.60	0.00	N/A	163.73	163.73	94.72%	267.33
2037	953	2,777.43	1,621.04	1,156.39	58.36%	175.70	36.09	18.01	18.08	10.29%	187.64	0.00	N/A	166.42	166.42	94.72%	267.55
2038	953	2,720.15	1,644.77	1,075.38	60.47%	178.77	36.53	18.55	17.98	10.06%	190.92	0.00	N/A	169.33	169.33	94.72%	266.98

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 94-0002, Public Act 94-0004, Public Act 96-0043, and Public Act 100-0023
Investment Return of 6.50% 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
2039	953	$2,661.19	$1,675.28	$985.91	62.95%	$182.02	$37.08	$19.09	$17.99	9.88%	$194.38	$0.00	N/A	$172.41	$172.41	94.72%	$265.54
2040	953	2,601.38	1,714.05	887.33	65.89%	185.49	37.68	19.61	18.07	9.74%	198.08	0.00	N/A	175.69	175.69	94.72%	263.25
2041	953	2,541.84	1,762.83	779.01	69.35%	189.10	38.41	20.14	18.27	9.66%	201.95	0.00	N/A	179.12	179.12	94.72%	259.96
2042	953	2,482.99	1,822.90	660.09	73.42%	192.91	39.07	20.66	18.41	9.54%	206.01	0.00	N/A	182.72	182.72	94.72%	256.21
2043	953	2,425.82	1,895.92	529.90	78.16%	196.79	39.85	21.19	18.66	9.48%	210.15	0.00	N/A	186.39	186.39	94.72%	251.64
2044	953	2,370.86	1,983.39	387.47	83.66%	200.87	40.61	21.72	18.89	9.40%	214.51	0.00	N/A	190.26	190.26	94.72%	246.65
2045	953	2,318.65	2,086.73	231.92	90.00%	205.07	41.36	22.26	19.10	9.31%	219.00	0.00	N/A	194.24	194.24	94.72%	241.28

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 94-0004, Public Act 96-0043, and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ 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	
2024	953	$3,068.77	$ 1,152.92	$1,915.85	37.57%	$154.64	$43.18	$14.27	$28.91	18.70%	$166.58	107.72%	$208.24
2025	953	3,088.93	1,197.55	1,891.38	38.77%	155.30	41.74	14.54	27.20	17.51%	169.78	109.32%	215.49
2026	953	3,101.45	1,205.05	1,896.40	38.85%	155.81	40.45	14.70	25.75	16.53%	169.74	108.94%	222.87
2027	953	3,105.30	1,235.87	1,869.43	39.80%	156.66	38.77	14.63	24.14	15.41%	170.07	108.56%	230.38
2028	953	3,101.66	1,262.45	1,839.21	40.70%	157.47	37.73	14.43	23.30	14.80%	170.35	108.17%	236.85
2029	953	3,090.13	1,285.79	1,804.34	41.61%	158.81	36.68	14.50	22.18	13.97%	171.79	108.17%	243.20
2030	953	3,071.26	1,306.51	1,764.75	42.54%	160.19	36.02	14.76	21.26	13.27%	173.29	108.17%	248.94
2031	953	3,045.61	1,325.28	1,720.33	43.51%	161.76	35.56	14.78	20.78	12.85%	174.98	108.17%	253.86
2032	953	3,013.02	1,342.91	1,670.11	44.57%	163.55	35.22	15.31	19.91	12.17%	176.92	108.17%	258.63
2033	953	2,974.90	1,360.85	1,614.05	45.74%	165.37	35.24	15.87	19.37	11.71%	178.89	108.17%	261.95
2034	953	2,931.51	1,380.29	1,551.22	47.08%	167.68	35.24	16.39	18.85	11.24%	181.38	108.17%	264.65
2035	953	2,883.77	1,402.55	1,481.22	48.64%	170.13	35.44	16.95	18.49	10.87%	184.04	108.17%	266.35
2036	953	2,832.21	1,428.84	1,403.37	50.45%	172.86	35.73	17.46	18.27	10.57%	186.99	108.17%	267.33
2037	953	2,777.43	1,460.33	1,317.10	52.58%	175.70	36.09	18.01	18.08	10.29%	190.07	108.17%	267.55
2038	953	2,720.15	1,498.45	1,221.70	55.09%	178.77	36.53	18.55	17.98	10.06%	193.39	108.17%	266.98

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 (Concluded)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0004, Public Act 96-0043, and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the
Projected Actuarial Value of Assets ($ 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	
2039	953	$2,661.19	$1,544.72	$1,116.47	58.05%	$182.02	$37.08	$19.09	$17.99	9.88%	$196.90	108.17%	$265.54
2040	953	2,601.38	1,600.76	1,000.62	61.54%	185.49	37.68	19.61	18.07	9.74%	200.65	108.17%	263.25
2041	953	2,541.84	1,668.43	873.41	65.64%	189.10	38.41	20.14	18.27	9.66%	204.56	108.17%	259.96
2042	953	2,482.99	1,749.15	733.84	70.45%	192.91	39.07	20.66	18.41	9.54%	208.68	108.17%	256.21
2043	953	2,425.82	1,844.71	581.11	76.04%	196.79	39.85	21.19	18.66	9.48%	212.87	108.17%	251.64
2044	953	2,370.86	1,956.73	414.13	82.53%	200.87	40.61	21.72	18.89	9.40%	217.29	108.17%	246.65
2045	953	2,318.65	2,086.82	231.83	90.00%	205.07	41.36	22.26	19.10	9.31%	221.83	108.17%	241.28

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 94-0002, Public Act 94-0004, Public Act 96-0043, and Public Act 100-0023
Investment Return of 6.50% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Annual Normal Cost				Required State Contribution				Minimum of (c) and (d)		Total Expenses
							Total	Employee Cont.	Employer Normal Cost	Percent of Pay	(a) Without GOB Cont.	(b) Debt Service	(c)=(a)-(b) Maximum Cont.	(d) Formula Rate With GOB	Required Cont.	Percent of Pay	
2024	953	$3,068.77	$1,396.08	$1,672.69	45.49%	$154.64	$43.18	$14.27	$28.91	18.70%	$166.58	$16.30	$150.28	$147.84	$147.84	95.60%	$208.24
2025	953	3,088.93	1,435.81	1,653.12	46.48%	155.30	41.74	14.54	27.20	17.51%	169.78	17.30	152.48	148.89	148.89	95.87%	215.49
2026	953	3,101.45	1,429.70	1,671.75	46.10%	155.81	40.45	14.70	25.75	16.53%	169.74	17.76	151.98	148.93	148.93	95.58%	222.87
2027	953	3,105.30	1,453.12	1,652.18	46.79%	156.66	38.77	14.63	24.14	15.41%	170.07	18.16	151.91	148.85	148.85	95.02%	230.38
2028	953	3,101.66	1,474.22	1,627.44	47.53%	157.47	37.73	14.43	23.30	14.80%	170.35	19.00	151.35	153.44	151.35	96.11%	236.85
2029	953	3,090.13	1,490.93	1,599.20	48.25%	158.81	36.68	14.50	22.18	13.97%	171.79	19.75	152.04	154.80	152.04	95.73%	243.20
2030	953	3,071.26	1,503.39	1,567.87	48.95%	160.19	36.02	14.76	21.26	13.27%	173.29	20.94	152.35	156.15	152.35	95.11%	248.94
2031	953	3,045.61	1,512.24	1,533.37	49.65%	161.76	35.56	14.78	20.78	12.85%	174.98	22.01	152.97	157.67	152.97	94.57%	253.86
2032	953	3,013.02	1,518.81	1,494.21	50.41%	163.55	35.22	15.31	19.91	12.17%	176.92	22.50	154.42	159.42	154.42	94.42%	258.63
2033	953	2,974.90	1,525.03	1,449.87	51.26%	165.37	35.24	15.87	19.37	11.71%	178.89	22.43	156.46	161.19	156.46	94.61%	261.95
2034	953	2,931.51	1,536.63	1,394.88	52.42%	167.68	35.24	16.39	18.85	11.24%	181.38	-	N/A	163.44	163.44	97.48%	264.65
2035	953	2,883.77	1,550.28	1,333.49	53.76%	170.13	35.44	16.95	18.49	10.87%	184.04	-	N/A	165.84	165.84	97.48%	266.35
2036	953	2,832.21	1,567.07	1,265.14	55.33%	172.86	35.73	17.46	18.27	10.57%	186.99	-	N/A	168.50	168.50	97.48%	267.33
2037	953	2,777.43	1,588.16	1,189.27	57.18%	175.70	36.09	18.01	18.08	10.29%	190.07	-	N/A	171.27	171.27	97.48%	267.55
2038	953	2,720.15	1,614.84	1,105.31	59.37%	178.77	36.53	18.55	17.98	10.06%	193.39	-	N/A	174.26	174.26	97.48%	266.98

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 (Concluded)

Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0002, Public Act 94-0004, Public Act 96-0043, and Public Act 100-0023
Investment Return of 6.50% 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				Minimum of (c) and (d)		
											(a)	(b)	(c)=(a)-(b)	(d)			
									Employer		Without			Formula			
Plan		Actuarial							Normal	Percent	GOB	Debt	Maximum	Rate With	Required	Percent	Total
Year End	Number	Accrued		Unfunded	Funded	Total		Employee	Normal	Percent	Cont.	Service	Cont.	GOB	Cont.	of Pay	Expenses
6/30	Active	Liability	Assets	Liability	Ratio	Payroll	Total	Cont.	Cost	of Pay							
2039	953	$2,661.19	$1,648.58	$1,012.61	61.95%	$182.02	$37.08	$19.09	$17.99	9.88%	$196.90	$0.00	N/A	$177.42	$177.42	97.48%	$265.54
2040	953	2,601.38	1,690.89	910.49	65.00%	185.49	37.68	19.61	18.07	9.74%	200.65	0.00	N/A	180.80	180.80	97.48%	263.25
2041	953	2,541.84	1,743.54	798.30	68.59%	189.10	38.41	20.14	18.27	9.66%	204.56	0.00	N/A	184.33	184.33	97.48%	259.96
2042	953	2,482.99	1,807.84	675.15	72.81%	192.91	39.07	20.66	18.41	9.54%	208.68	0.00	N/A	188.04	188.04	97.48%	256.21
2043	953	2,425.82	1,885.49	540.33	77.73%	196.79	39.85	21.19	18.66	9.48%	212.87	0.00	N/A	191.82	191.82	97.48%	251.64
2044	953	2,370.86	1,977.99	392.87	83.43%	200.87	40.61	21.72	18.89	9.40%	217.29	0.00	N/A	195.80	195.80	97.48%	246.65
2045	953	2,318.65	2,086.81	231.84	90.00%	205.07	41.36	22.26	19.10	9.31%	221.83	0.00	N/A	199.89	199.89	97.48%	241.28

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, 2023 and 2022

	2023	2022
Assets		
Cash	$ 18,852,450	$ 18,876,181
Receivables:		
Contributions:		
Participants	$ 67,235	$ 12,270
Employer - GRF Fund	-	-
Other accounts	142,171	77,415
	$ 209,406	$ 89,685
Investments - held in the Illinois State Board of		
Investment Commingled Fund at fair value	$ 1,306,833,348	$ 1,258,906,346
Securities lending collateral with State Treasurer	2,491,000	2,288,000
Capital assets, net of accumulated		
depreciation	$ 172,627	$ 162,793
Total Assets	$ 1,328,558,831	$ 1,280,323,005
Liabilities		
Benefits payable	$ 169	$ -
Refunds payable	646	108,334
Administrative expenses payable	169,152	162,397
Participants' deferred service credit accounts	-	-
Due to the State of Illinois	-	-
Securities lending collateral with State Treasurer	2,491,000	2,288,000
Total Liabilities	$ 2,660,967	$ 2,558,731
Net assets held in trust for pension benefits	$ 1,325,897,864	$ 1,277,764,274

Assets were updated subsequent to the delivery of the actuarial valuation report which was presented to the Board on October 27, 2023. The updates did not significantly impact the certified contribution rate which was approved by the Board on October 27, 2023. The asset update decreased investments from $1,306,833,348 to $1,303,262,688. This change decreased the market value of assets at June 30, 2023, from $1,325,897,864 to $1,322,327,204.

Table 6
Statement of Changes in Fiduciary Net Position
for Years Ended June 30, 2023 and 2022

	2023	2022
Additions:		
Contributions:		
Participants	$ 15,006,659	$ 14,573,802
Employing state agencies and appropriations	147,429,857	155,993,000
Total Contributions revenue	$ 162,436,516	$ 170,566,802
Investments income:		
Net investments income	$ 15,614,837	$ 23,937,868
Interest earned on cash balances	405,629	60,596
Net appreciation in fair value of investments	63,812,165	(114,887,815)
Total Investments income	$ 79,832,631	$ (90,889,351)
Other:		
Miscellaneous	$ -	$ -
Total Investments income	$ -	$ -
Total Additions	$ 242,269,147	$ 79,677,451
Deductions:		
Benefits:		
Retirement annuities	$ 162,422,191	$ 151,707,410
Survivors' annuities	29,890,385	28,715,459
Temporary Disability benefits	-	-
Lump-sum benefits	-	-
Total Benefits	$ 192,312,576	$ 180,422,869
Refunds	747,851	804,052
Administrative	1,075,130	1,123,921
Total Deductions	$ 194,135,557	$ 182,350,842
Net increase	$ 48,133,590	$ (102,673,391)
Net assets held in trust for pension benefits:		
Beginning of year	$ 1,277,764,274	$ 1,380,437,665
End of year	$ 1,325,897,864	$ 1,277,764,274

Assets were updated subsequent to the delivery of the actuarial valuation report which was presented to the Board on October 27, 2023. The updates did not significantly impact the certified contribution rate which was approved by the Board on October 27, 2023. The asset update decreased the total investment income from $79,832,631 to $76,261,971. This change decreased the market value of assets at June 30, 2023, from $1,325,897,864 to $1,322,327,204.

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

Year Ending June 30	2023	2024	2025	2026	2027
Beginning of Year:					
(1) Market Value of Assets	$ 1,280,555,922				
(1a) Market Value Adjustment	(2,791,648)				
(1b) Market Value of Assets - Adjusted	1,277,764,274				
(2) Actuarial Value of Assets	1,309,800,342				
End of Year:					
(3) Market Value of Assets	1,325,897,864				
(4) Contributions and Disbursements					
(4a) Actual State Contribution Amount	147,429,857				
(4b) Employee Contribution Amount	15,006,659				
(4c) Benefit Payouts & Refunds	(193,060,427)				
(4d) Administrative Expenses	(1,075,130)				
(4e) Net of Contributions and Disbursements	(31,699,041)				
(5) Total Investment Income					
=(3)-(1)-(4e)	79,832,631				
(6) Projected Rate of Return	6.50%				
(7) Projected Investment Income					
=(1)x(6)+([1+(6)]^.5-1)x(4e)	82,040,677				
(8) Investment Income in					
Excess of Projected Income	(2,208,046)				
(9) Excess Investment Income Recognized					
This Year (5-year recognition)					
(9a) From This Year	$ (441,609)				
(9b) From One Year Ago	(35,489,840)	$ (441,609)			
(9c) From Two Years Ago	40,695,290	(35,489,840)	$ (441,609)		
(9d) From Three Years Ago	(4,338,951)	40,695,290	(35,489,840)	$ (441,609)	
(9e) From Four Years Ago	(693,029)	(4,338,953)	40,695,292	(35,489,839)	$ (441,610)
(9f) Total Recognized Investment Gain	(268,139)	424,888	4,763,843	(35,931,448)	(441,610)
(10) Change in Actuarial Value of Assets					
=(1a)+(4e)+(7)+(9f)	$ 47,281,849				
End of Year:					
(3) Market Value of Assets	**$ 1,325,897,864**				
(11) Actuarial Value of Assets					
=(2)+(10)	**$ 1,357,082,191**				

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

Year Ending June 30	2023	2024	2025	2026	2027
Beginning of Year:					
(1) Hypothetical Value of Assets	$ 1,031,528,772				
(2) Hypothetical Actuarial Value of Assets	1,055,654,776				
End of Year:					
(3) Hypothetical Value of Assets	1,085,049,951				
(4) Contributions and Disbursements					
(4a) State Contribution Amount[a]	167,710,164				
(4b) Employee Contribution Amount	15,006,659				
(4c) Benefit Payouts & Refunds	(193,060,427)				
(4d) Administrative Expenses	(1,075,130)				
(4e) Net of Contributions and Disbursements	(11,418,734)				
(5) Total Investment Income[b]					
=(3)-(1)-(4e)	64,939,913				
(6) Projected Rate of Return	6.50%				
(7) Projected Investment Income					
=(1)x(6)+([1+(6)]^.5-1)x(4e)	66,684,103				
(8) Investment Income in					
Excess of Projected Income	(1,744,190)				
(9) Excess Investment Income Recognized					
This Year (5-year recognition)					
(9a) From This Year	$ (348,838)				
(9b) From One Year Ago	(28,435,538)	$ (348,838)			
(9c) From Two Years Ago	32,304,560	(28,435,538)	$ (348,838)		
(9d) From Three Years Ago	(3,385,944)	32,304,560	(28,435,538)	$ (348,838)	
(9e) From Four Years Ago	(525,644)	(3,385,945)	32,304,561	(28,435,538)	$ (348,838)
(9f) Total Recognized Investment Gain	(391,404)	134,239	3,520,185	(28,784,376)	(348,838)
(10) Change in Hypothetical Actuarial Value of Assets					
=(4e)+(7)+(9f)	$ 54,873,965				
End of Year:					
(3) Hypothetical Market Value of Assets	$ 1,085,049,951				
(11) Hypothetical Actuarial Value of Assets					
=(2)+(10)	$ 1,110,528,741				

[a] Represents FY 2023 no POB basic contribution. This amount was determined as part of the June 30, 2021 valuation 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 2023 of 6.33 percent.

SECTION D

PARTICIPANT DATA

Table 9
Active Age and Service Distribution as of June 30, 2023

Age Group	Years of Service 0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Up	Total	Percentage of Total
Under 20											
20-24											
25-29											
30-34											
35-39	5	6	1							12	1.3%
40-44	28	38	8	1						75	7.9%
45-49	22	47	33	5						107	11.2%
50-54	22	49	55	36	8					170	17.8%
55-59	10	27	49	53	40	12				191	20.0%
60-64	11	33	44	41	29	8	1			167	17.5%
65-69	5	18	24	33	17	12	4	4		117	12.3%
70 & Over			15	25	16	21	12	10	15	114	12.0%
Total	103	218	229	194	110	53	17	14	15	953	100.0%
Percentage of Total	10.8%	22.9%	24.0%	20.4%	11.5%	5.6%	1.8%	1.5%	1.6%	100%	

Based on data received from the System, of the 953 active members, 178 were classified as "Single," 712 classified as "Married," and 63 were classified as "Unknown." We assume 80 percent are married and elect survivor benefits when they retire.

Table 10
Retirees and Beneficiaries by Type of Benefit Being Paid as of June 30, 2023

Type of Benefit Being Paid	Count*		Monthly Payment		Annual Payment		Average Annual Payment
Retirement Annuity	1,019	$	13,731,979.02	$	164,783,748	$	161,711.23
QILDRO	30		102,415.94		1,228,991		40,966.38
Survivor's Annuity	329		2,568,293.04		30,819,516		93,676.34
Total	**1,378**	**$**	**16,402,688.00**	**$**	**196,832,256**	**$**	**142,839.08**

Counts include one retired member who also has a survivor annuity.

SECTION E

ACTUARIAL METHODS AND ASSUMPTIONS

Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2022 Actuarial Valuation)

Actuarial Cost Method as Mandated by 40 ILCS 5/18-131, 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 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 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, 2022

Actuarial assumptions are set by the Board of Trustees. Additional information regarding the rationale for the assumptions may be found in the experience study of the Judges' Retirement System for the three-year period ending June 30, 2021. All actuarial assumptions are expectations of future experience, not market measures.

Mortality

Post-Retirement Mortality

Pub-2010 Above-Median Income General Healthy Retiree Mortality tables, sex distinct, with no scaling factors, and the MP-2021 two-dimensional generational mortality improvement scales. This assumption provides a margin for future mortality improvements.

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

Pub-2010 Above-Median Income General Employee Mortality tables, sex distinct, with no scaling factors, and the MP-2021 two-dimensional generational mortality improvement scales. This assumption provides a margin for future mortality improvements.

Future mortality improvements are reflected by projecting the base mortality tables forward from the year 2010 using the MP-2021 projection scales.

Actuarial Methods and Assumptions
(Most Adopted Effective with the June 30, 2022
Actuarial Valuation)

Interest

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

General Inflation

2.25 percent per year, compounded annually.

This assumption serves as the basis for the determination of Tier 2 pay cap growth and annual increases that are equal to the lesser of 3.0 percent or the annual change in the Consumer Price Index-U during the preceding 12-month calendar year.

Marriage Assumption

80.0 percent of active and retired participants are assumed to be married.

Termination

Illustrative rates of withdrawal from the plan are as follows:

Age-Based Withdrawal		
Age	Male	Female
30	0.0159	0.0192
35	0.0159	0.0192
40	0.0159	0.0192
45	0.0149	0.0192
50	0.0124	0.0188
55	0.0099	0.0148
60	0.0086	0.0108
65	0.0076	0.0068

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.

Salary Increases

A salary increase assumption of 2.50 percent per year, compounded annually, was used. This 2.50 percent salary increase assumption includes an inflation component of 2.25 percent per year, and a productivity/merit/promotion component of 0.25 percent.

Disability

No assumption for disability.

Actuarial Methods and Assumptions
(Most Adopted Effective with the June 30, 2022
Actuarial Valuation)

Load for Inactive Members Eligible for Deferred Vested Pension Benefits

Deferred vested liability is increased by 10 percent to account for increases in final average salary due to participation in a reciprocal system.

Employee Contribution Election

For purposes of the actuarial valuation, it is assumed that all judges elect to contribute only on increases in salary when they become eligible for this provision.

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 average pay as disclosed below. The new entrant profile is based on the averages for all current active members. The average increase in uncapped payroll for the projection period is 2.50 percent per year. The average increase in capped payroll for the projection period is 2.25 percent per year.

New Entrant Profile			
Age Group	No.	Uncapped Salary	Capped Salary
Under 20			
20-24			
25-29			
30-34	16	$ 3,739,878	$ 2,145,142
35-39	95	21,125,956	12,736,779
40-44	184	40,427,887	24,669,130
45-49	214	46,959,171	28,691,271
50-54	150	32,969,744	20,110,704
55-59	120	26,207,927	16,088,563
60-64	52	11,429,833	6,971,711
65-69	5	1,093,773	670,357
70 & Over			
Total	836	$ 183,954,169	$ 112,083,657
Avg. Salary		$ 220,041	$ 134,071
Avg. Age			47.80
Percent Male			62.08%

Actuarial Methods and Assumptions
(Most Adopted Effective with the June 30, 2022
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	
Age	Males & Females
60	12.00%
61-65	12.00%
66-70	12.00%
70-74	13.00%
75-79	13.00%
80+	100.00%

Early Retirement Rates		
Age	Male	Female
55	5.50%	8.50%
56	5.50%	8.50%
57	5.50%	8.50%
58	5.50%	8.50%
59	5.50%	8.50%

Assets

Assets available for benefits are determined as described on page 45. 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 JRS staff, based on current expenses and expected to increase in relation to the projected capped payroll. Expenses are included in the service cost.

Spouse's Age

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

Decrement Timing

All decrements are assumed to occur beginning of year.

Actuarial Methods and Assumptions
(Most Adopted Effective with the June 30, 2022
Actuarial Valuation)

Decrement Relativity

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

Decrement Operation

Turnover decrements do not operate after 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.

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

No explicit assumption is made with respect to these items.

Assumptions as a Result of Public Act 96-0889 – Tier 2 Assumptions

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.

Retirement rates for Tier 2 members to account for the change in retirement age as follows:

Retirement Rates for Tier 2 Members	
Age	Male & Female
67	30.00%
68-69	12.00%
70	13.00%
71	10.00%
72	11.00%
73	12.00%
74	13.00%
75-79	14.00%
80	100.00%

Early Retirement Rates for Tier 2 Members	
Age	Males and Females
62	11.00%
63	12.00%
64	13.00%
65	14.00%
66	14.00%

Actuarial Methods and Assumptions
(Most Adopted Effective with the June 30, 2022
Actuarial Valuation)

Illustrative rates of withdrawal from the plan for Tier 2 members are as follows:

Age-Based Withdrawal for Tier 2 Members		
Age	Male	Female
30	0.0200	0.0200
35	0.0197	0.0195
40	0.0182	0.0170
45	0.0167	0.0170
50	0.0152	0.0165
55	0.0137	0.0140
60	0.0137	0.0115
65	0.0137	0.0090

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 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 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 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 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 5/18-131:

(c) Notwithstanding any other provision of this Article, the total required State contribution for fiscal year 2006 is $29,189,400.

Notwithstanding any other provision of this Article, the total required State contribution for fiscal year 2007 is $35,236,800.

For each State fiscal year 2008 through 2010, the State contribution to the System, as a percentage of the applicable employee payroll, shall be increased in equal annual increments from the required State contribution for State fiscal year 2007, so that by State fiscal year 2011, the State is contributing at a rate otherwise required under this Section.

State Contributions under P.A. 96-0043

The following is an excerpt from the Illinois Compiled statutes 40 ILCS 5/18-131:

(d) 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.

(e) 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.

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.

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

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, 2013, 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.
4. Beginning with the June 30, 2019, actuarial valuation, there were changes to the economic and demographic assumptions.
5. Beginning with the June 30, 2022, actuarial valuation, there were changes to the demographic assumptions.

Valuation Year Ending June 30,	2019	2020	2021	2022	2023	2024	2025	2026	2027
Applicable Fiscal Year Ending June 30,	2021	2022	2023	2024	2025	2026	2027	2028	2029
	\$ in Millions								
	After Impact of GOB Proceeds								
Contribution Before Assumption Change									
(1) Contribution Dollar	\$ 149.827	\$ -	\$ -	\$ 148.931	\$ -				
(2) Contribution Rate	94.872%	0.000%	0.000%	96.260%	0.000%				
Contribution After Assumption Change									
(3) Contribution Dollar	\$ 146.667	\$ -	\$ -	\$ 145.890	\$ -				
(4) Contribution Rate	93.009%	0.000%	0.000%	94.341%	0.000%				
(5) Assumption Change Impact as a Percentage of Capped Payroll [(4) - (2)]	-1.863%	0.000%	0.000%	-1.920%	0.000%				
(6) Assumption Change Impact Recognized This Year (5-year Recognition)									
(6a) From This Year	-0.373%	0.000%	0.000%	-0.384%	0.000%				
(6b) From One Year Ago	0.203%	-0.373%	0.000%	0.000%	-0.384%	0.000%			
(6c) From Two Years Ago	0.000%	0.203%	-0.373%	0.000%	0.000%	-0.384%	0.000%		
(6d) From Three Years Ago	1.796%	0.000%	0.203%	-0.373%	0.000%	0.000%	-0.384%	0.000%	
(6e) From Four Years Ago	0.000%	1.797%	0.000%	0.205%	-0.371%	0.000%	0.000%	-0.384%	0.000%
(6f) Total Recognized Assumption Change Impact	1.626%	1.627%	-0.170%	-0.552%	-0.755%	-0.384%	-0.384%	-0.384%	0.000%

Section F

Summary of Plan Provisions

Summary of Plan Provisions
(as of June 30, 2023)

1. **Participation.** Participation in the system is mandatory when a person first becomes a judge, unless an "Election Not to Participate" is filed by the judge within 30 days of the date of notification of this option.

2. **Member Contributions.** All members of the System are required to contribute to the System the following percentage of their salaries:

Retirement Annuity	7.5 percent
Automatic Annuity Increase	1.0
Survivor's Annuity	2.5
Total	11.0 percent

   All judges who become participants after December 31, 1992, are required to make contributions toward the survivor's annuity unless they file an election not to participate in the survivor's annuity benefit, in which case the total participant contribution rate is 8.5 percent of salary.

3. **Discontinuance of Contributions.** A participant who becomes eligible to receive the maximum rate of annuity may elect to discontinue contributions and have his or her benefits "fixed" based upon the final rate of salary immediately prior to the effective date of such election. This election, once made, is irrevocable.

4. **Election to Contribute Only on Increases in Salary.** A participant who has attained age 60 and continues to serve as a judge after becoming eligible to receive the maximum rate of annuity and has not elected to discontinue contributing to the system may elect to make contributions based only on the amount of the increases in salary received by the judge on or after the date of the election.

5. **Retirement Annuity – Eligibility.** A judge who has at least 10 years of service may retire with an unreduced retirement annuity upon attainment of age 60. A judge with at least six years of service may retire with an unreduced retirement annuity upon attainment of age 62.

   A judge with at least 10 years of service may retire upon attainment of age 55, with the amount of the retirement annuity reduced 1/2 of 1 percent for each month that the judge is under age 60 if the judge has less than 28 years of service. This penalty for retirement before age 60 is reduced by 5/12 of 1 percent for every month of service in the System in excess of 20 years.

6. **Retirement Annuity – Amount.** The retirement annuity is determined according to the following formula based upon the final rate of salary:

   – 3 ½ percent for each of the first 10 years of service; plus
   – 5 percent for each year of service in excess of 10

   The maximum retirement annuity is 85 percent of the final rate of salary.

7. **Automatic Increase In Retirement Annuity.** Annual automatic increases of 3 percent of the current amount of retirement annuity are provided. The initial increase is effective in the month of January of the year next following the year in which the first anniversary of retirement occurs.

8. **Temporary Total Disability.** A member with at least two years of service who becomes totally disabled and unable to perform his or her duties as a judge is entitled to a temporary disability benefit equal to 50 percent of salary payable during the period of disability but not beyond the end of the term of office.

9. **Total and Permanent Disability.** A member with at least 10 years of service who becomes totally and permanently disabled while serving as a judge is eligible to commence receiving his or her retirement annuity without reduction regardless of age.

10. **Survivor's Annuity – Participation and Eligibility.** A married judge, an unmarried judge who becomes a participant after December 31, 1992, or a judge who marries after becoming a participant is subject to the provisions relating to the survivor's annuity unless he or she files a written notice of election not to participate in the survivor's annuity.

    An active judge who is not contributing for the survivor's annuity and later marries or remarries may receive partial credit for the survivor's annuity, thereby providing a prorated benefit for his or her spouse by contributing to the survivor's annuity benefit prospectively from the date of marriage.

    A surviving spouse without children is eligible for survivor benefits at age 50 or over, provided marriage to the member had been in effect for at least one year immediately prior to the member's death.

    A surviving spouse with unmarried eligible children of the member is eligible for a survivor's annuity benefit at any age, provided the above marriage requirements have been met. When all children are disqualified because of death, marriage, or attainment of age 18, or age 22 in the case of a full-time student, the spouse's benefit is suspended if the spouse is under age 50 until the attainment of such age.

    Children of the member who are under age 18 or under age 22 and a full-time student or who are over age 18 and dependent because of a physical or mental disability are eligible for survivor benefits. Legally adopted children are eligible for survivor benefits on the same basis as other children.

    If the member dies in service as a judge, the member must have at least 1 1/2 years of service credit for survivor's annuity eligibility. If death occurs after termination of service, the deceased member must have at least 10 years of service credit for survivor's annuity eligibility.

11. Survivor's Annuity – Amount.

(a) Upon the death of an annuitant, his or her surviving spouse shall be entitled to a survivor's annuity of 66-2/3 percent of the annuity the annuitant was receiving immediately prior to his or her death.

(b) Upon the death of a judge while in service, the surviving spouse shall receive a survivor's annuity of 66-2/3 percent of the annuity earned by the judge as of the date of death, or 7-1/2 percent of the judge's last salary, whichever is greater.

(c) Upon the death of a former judge who had terminated service with at least 10 years of service, his or her surviving spouse shall be entitled to a survivor's annuity of 66-2/3 percent of the annuity earned by the deceased member as of the date of death.

(d) Upon the death of an annuitant, a judge in service, or a former judge who had terminated service with at least 10 years of service, each surviving child unmarried and under the age of 18, or age 22 in the case of a full-time student, or disabled shall be entitled to a child's annuity in an amount equal to 5 percent of the decedent's final salary, not to exceed in total for all such children the greater of 20 percent of final salary or 66-2/3 percent of the earned retirement annuity.

(e) Survivor's annuities are subject to annual automatic increases of 3 percent of the current amount of annuity.

12. Refund of Contributions. A participant who ceases to be a judge may apply for and receive a refund of his or her total contributions to the system, provided he or she is not then eligible to receive a retirement annuity.

A participant who becomes unmarried, either before or after retirement, is entitled to a refund of contributions made for the survivor's annuity.

Judges Who First Become Participants on or after January 1, 2011 ("Tier 2")

The following changes to the above provisions apply to judges who first become participants on or after January 1, 2011:

1. The highest salary for annuity purposes is equal to the average monthly salary obtained by dividing the participant's total salary during the 96 consecutive months of service within the last 120 months of service in which the total compensation was the highest by the number of months in that period.

2. The required contributions shall not exceed the contributions that would be due on the highest salary for annuity purposes.

3. For 2011, the final average salary is limited to the Social Security wage base of $106,800. Limitations for future years shall automatically be increased or decreased, as applicable, by a percentage change in the Consumer Price Index-U during the preceding 12-month calendar year.

4. A participant is eligible to retire with unreduced benefits after attainment of age 67 with at least eight years of service credit. However, a participant may elect to retire at age 62 with at least eight years of service credit and receive a retirement annuity reduced by one-half of 1 percent for each month that his or her age is under 67.

5. The annual retirement annuity provided is equal to 3 percent of the participant's final average salary for each year of service. The maximum retirement annuity payable shall be 60 percent of the participant's final average salary.

6. Automatic annual increases are provided in the retirement annuity then being paid equal to 3 percent or the annual change in the Consumer Price Index for all Urban Consumers, whichever is less. Such increases are payable in the January next following attainment of age 67 and in January of each year thereafter.

7. Automatic annual increases are provided in the survivor annuity then being paid equal to 3 percent or the annual change in the Consumer Price Index for all Urban Consumers, whichever is less. Such increases are payable on each January 1 occurring on or after attainment of age 67.

8. The retirement annuity being paid is suspended when an annuitant accepts full-time employment in a position covered under the Judges' Retirement System or any other article of the Illinois Pension Code. Upon termination of the employment, the retirement annuity shall resume and, if appropriate, be recalculated.

9. Salary and COLA development for members hired on or after January 1, 2011, are shown in the table below:

Year Ending	CPI-U	COLA	Maximum Annual Pensionable Earnings
2011		3.00%	$106,800.00
2012	3.90%	3.00%	$110,004.00
2013	2.00%	2.00%	$112,204.08
2014	1.20%	1.20%	$113,550.53
2015	1.70%	1.70%	$115,480.89
2016	0.00%	0.00%	$115,480.89
2017	1.50%	1.50%	$117,213.10
2018	2.20%	2.20%	$119,791.79
2019	2.30%	2.30%	$122,547.00
2020	1.70%	1.70%	$124,630.30
2021	1.40%	1.40%	$126,375.12
2022	5.40%	3.00%	$130,166.37
2023	8.20%	3.00%	$134,071.36

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 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 a 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 Statement 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 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 Statement No. 67 and GASB Statement 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. GASB Statement No. 68, which replaced GASB Statement No. 27 effective with fiscal year ending June 30, 2015, sets the accounting rules for the employers that sponsor or contribute to public retirement systems. GASB Statement No. 67, which replaced GASB 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		Current Actives			Grand Totals		
	Retirees & Beneficiaries	Deferreds	Tier 1	Current Tier 2	Future Tier 2	Current Retirees, Beneficiaries & Deferreds	Actives	Total
2023	$2,422.89	$6.67	$ 495.88	$ 115.98	$ 0.00	$2,429.56	$ 611.86	$3,041.42
2024	2,375.43	6.27	546.03	141.04	0.00	2,381.70	687.07	3,068.77
2025	2,323.20	6.56	591.04	166.75	1.38	2,329.76	759.17	3,088.93
2026	2,266.23	6.87	631.03	193.13	4.20	2,273.10	828.35	3,101.45
2027	2,204.62	7.19	665.25	219.71	8.54	2,211.80	893.50	3,105.30
2028	2,138.47	7.48	694.63	246.38	14.70	2,145.95	955.70	3,101.66
2029	2,067.94	7.75	718.84	272.82	22.79	2,075.69	1,014.44	3,090.13
2030	1,993.25	7.99	737.91	299.03	33.09	2,001.23	1,070.03	3,071.26
2031	1,914.62	8.24	752.05	324.88	45.81	1,922.86	1,122.74	3,045.61
2032	1,832.38	8.30	760.90	350.20	61.23	1,840.68	1,172.34	3,013.02
2033	1,746.88	8.31	765.51	374.76	79.44	1,755.19	1,219.71	2,974.90
2034	1,658.53	8.31	765.96	398.23	100.49	1,666.84	1,264.68	2,931.51
2035	1,567.80	8.30	762.75	420.37	124.55	1,576.10	1,307.67	2,883.77
2036	1,475.24	8.27	755.94	441.05	151.70	1,483.51	1,348.70	2,832.21
2037	1,381.41	8.23	745.84	459.91	182.05	1,389.64	1,387.80	2,777.43
2038	1,286.93	8.17	732.65	476.68	215.71	1,295.10	1,425.04	2,720.15
2039	1,192.47	8.10	716.75	491.14	252.74	1,200.56	1,460.63	2,661.19
2040	1,098.69	8.00	698.32	503.20	293.16	1,106.69	1,494.69	2,601.38
2041	1,006.29	7.89	677.69	513.01	336.96	1,014.18	1,527.66	2,541.84
2042	915.94	7.76	654.85	520.36	384.06	923.70	1,559.28	2,482.99
2043	828.30	7.61	630.21	525.25	434.44	835.92	1,589.90	2,425.82
2044	744.00	7.44	603.89	527.58	487.94	751.45	1,619.42	2,370.86
2045	663.59	7.26	576.05	527.29	544.45	670.85	1,647.80	2,318.65

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

Valuation Date June 30	Current Inactives		Current Actives			Grand Totals		
	Retirees & Beneficiaries	Deferreds	Tier 1	Current Tier 2	Future Tier 2	Current Retirees, Beneficiaries & Deferreds	Actives	Total
2023	$2,422.89	$6.67	$ 620.77	$288.96	$ 0.00	$2,429.56	$ 909.73	$3,339.29
2024	2,375.43	6.27	653.75	306.00	20.22	2,381.70	979.96	3,361.67
2025	2,323.20	6.56	683.22	323.34	40.31	2,329.76	1,046.87	3,376.63
2026	2,266.23	6.87	709.29	340.93	60.80	2,273.10	1,111.01	3,384.11
2027	2,204.62	7.19	731.37	358.62	84.71	2,211.80	1,174.70	3,386.50
2028	2,138.47	7.48	750.03	376.34	108.89	2,145.95	1,235.25	3,381.21
2029	2,067.94	7.75	764.91	393.89	135.70	2,075.69	1,294.50	3,370.19
2030	1,993.25	7.99	775.97	411.22	164.07	2,001.23	1,351.26	3,352.49
2031	1,914.62	8.24	783.28	428.29	194.41	1,922.86	1,405.98	3,328.85
2032	1,832.38	8.30	786.54	444.97	226.68	1,840.68	1,458.19	3,298.87
2033	1,746.88	8.31	786.43	461.02	260.54	1,755.19	1,507.99	3,263.18
2034	1,658.53	8.31	782.96	476.21	297.24	1,666.84	1,556.41	3,223.24
2035	1,567.80	8.30	776.50	490.37	336.25	1,576.10	1,603.11	3,179.22
2036	1,475.24	8.27	767.02	503.40	377.88	1,483.51	1,648.30	3,131.81
2037	1,381.41	8.23	754.72	515.03	422.49	1,389.64	1,692.24	3,081.87
2038	1,286.93	8.17	739.73	525.06	469.90	1,295.10	1,734.69	3,029.80
2039	1,192.47	8.10	722.35	533.29	520.07	1,200.56	1,775.71	2,976.28
2040	1,098.69	8.00	702.70	539.67	573.09	1,106.69	1,815.46	2,922.16
2041	1,006.29	7.89	681.06	544.27	628.46	1,014.18	1,853.79	2,867.97
2042	915.94	7.76	657.41	546.92	687.27	923.70	1,891.60	2,815.31
2043	828.30	7.61	632.10	547.60	748.66	835.92	1,928.37	2,764.28
2044	744.00	7.44	605.25	546.22	813.16	751.45	1,964.63	2,716.08
2045	663.59	7.26	577.01	542.72	880.84	670.85	2,000.57	2,671.42

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

Valuation Date June 30	Current Inactives		Current Actives			Grand Totals		
	Retirees & Beneficiaries	Deferreds	Tier 1	Current Tier 2	Future Tier 2	Current Retirees, Beneficiaries & Deferreds	Actives	Total
2023	$198.60	$0.81	$7.15	$ 1.69	$ 0.00	$199.40	$ 8.84	$208.24
2024	200.23	0.12	12.62	2.47	0.06	200.35	15.15	215.49
2025	201.53	0.12	17.77	3.32	0.13	201.64	21.23	222.87
2026	202.44	0.12	23.27	4.33	0.22	202.57	27.82	230.38
2027	202.96	0.16	27.99	5.42	0.32	203.12	33.73	236.85
2028	203.03	0.22	32.82	6.70	0.44	203.25	39.96	243.20
2029	202.63	0.25	37.47	8.01	0.58	202.89	46.06	248.94
2030	201.73	0.26	41.79	9.36	0.73	201.99	51.87	253.86
2031	200.29	0.46	46.18	10.82	0.89	200.75	57.88	258.63
2032	198.27	0.51	49.65	12.47	1.05	198.78	63.17	261.95
2033	195.64	0.52	52.89	14.32	1.28	196.16	68.49	264.65
2034	192.37	0.54	55.58	16.27	1.59	192.91	73.44	266.35
2035	188.44	0.55	58.09	18.26	1.98	188.99	78.33	267.33
2036	183.84	0.56	60.23	20.44	2.47	184.40	83.15	267.55
2037	178.55	0.57	62.05	22.72	3.08	179.13	87.85	266.98
2038	172.59	0.59	63.44	25.09	3.82	173.18	92.35	265.54
2039	165.98	0.60	64.53	27.41	4.73	166.58	96.67	263.25
2040	158.74	0.61	65.24	29.54	5.83	159.35	100.60	259.96
2041	150.93	0.62	65.81	31.71	7.14	151.55	104.65	256.21
2042	142.61	0.63	65.93	33.79	8.68	143.24	108.40	251.64
2043	133.86	0.64	65.83	35.83	10.48	134.50	112.14	246.65
2044	124.78	0.65	65.49	37.80	12.57	125.43	115.85	241.28
2045	115.46	0.66	64.84	39.51	14.95	116.12	119.30	235.42

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

Valuation Date June 30	Tier 1 Active Members				Tier 2 Active Members				Future Tier 2 Active Members			
	Population	Covered Payroll	Employee Contributions	Normal Cost	Population	Covered Payroll	Employee Contributions	Normal Cost	Population	Covered Payroll	Employee Contributions	Normal Cost
2023	311	$69.03	$4.85	$24.50	642	$85.61	$9.42	$18.67	0	$ 0.00	$ 0.00	$ 0.00
2024	269	61.59	4.24	21.84	619	84.91	9.34	18.50	64	8.80	0.97	1.40
2025	236	55.36	3.65	19.29	595	83.43	9.18	18.38	121	17.02	1.87	2.77
2026	207	49.79	2.88	16.69	572	81.98	9.02	17.92	174	24.89	2.74	4.16
2027	179	44.01	1.95	14.55	544	79.73	8.77	17.42	230	33.73	3.71	5.76
2028	156	39.44	1.37	12.53	516	77.29	8.50	16.80	281	42.08	4.63	7.36
2029	135	34.83	0.97	10.67	485	74.39	8.18	16.23	333	50.97	5.61	9.12
2030	115	30.49	0.34	9.01	456	71.41	7.85	15.58	382	59.86	6.59	10.97
2031	98	26.58	0.25	7.39	425	68.07	7.49	14.89	430	68.91	7.58	12.94
2032	81	22.55	0.16	6.19	396	64.79	7.13	14.21	476	78.03	8.58	14.83
2033	69	19.56	0.10	5.11	367	61.53	6.77	13.45	517	86.58	9.52	16.68
2034	57	16.76	0.08	4.23	339	58.08	6.39	12.64	556	95.29	10.48	18.57
2035	48	14.44	0.03	3.46	311	54.54	6.00	11.83	593	103.89	11.43	20.45
2036	40	12.22	0.03	2.83	285	51.06	5.62	10.93	628	112.43	12.37	22.33
2037	33	10.33	0.02	2.30	259	47.39	5.21	10.01	661	121.06	13.32	24.23
2038	27	8.66	0.02	1.88	234	43.73	4.81	9.07	692	129.63	14.26	26.12
2039	22	7.33	0.02	1.53	209	40.07	4.41	8.16	721	138.09	15.19	27.98
2040	18	6.15	0.01	1.26	187	36.53	4.02	7.35	748	146.43	16.11	29.81
2041	15	5.21	0.01	0.99	166	33.30	3.66	6.52	772	154.41	16.98	31.56
2042	12	4.20	0.01	0.81	147	30.06	3.31	5.75	794	162.52	17.88	33.30
2043	10	3.48	0.01	0.63	129	27.00	2.97	5.01	814	170.39	18.74	34.96
2044	7	2.79	0.01	0.48	112	24.03	2.64	4.29	833	178.25	19.61	36.59
2045	6	2.13	0.00	0.35	96	21.08	2.32	3.67	851	186.17	20.48	38.19

SECTION I

HISTORICAL VALUATION INFORMATION AND RESULTS

Table 15
Key Historical Valuation Results

Historical Actuarial Valuation Information and Results ($ in Millions)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Member Counts			Covered Uncapped Payroll	Benefits and Expenses	Net Investment Income	Actual State Contributions	Employee Contributions	Actuarially Determined Contribution	ADC Contribution Shortfall	Normal Cost[a]
Valuation Year	Active	Inactive	Retiree								
2016	947	25	1,144	$ 177.99	$ 134.17	$ (6.47)	132.06	$ 14.96	$ 121.36	$ (10.70)	$ 56.06
2017	953	23	1,175	182.24	142.39	97.80	131.33	14.77	152.70	21.37	54.07
2018	936	21	1,193	182.78	149.53	69.95	135.96	14.30	168.06	32.09	51.66
2019	956	26	1,262	190.74	159.25	64.74	140.52	14.61	169.63	29.11	49.70
2020	947	24	1,276	193.42	167.01	48.13	144.16	14.51	173.70	29.54	48.32
2021	944	29	1,298	197.89	174.51	275.45	148.62	14.60	173.21	24.58	46.99
2022	940	24	1,323	200.34	182.35	(88.10)	155.99	14.57	175.82	19.83	45.05
2023	953	25	1,378	209.52	194.14	79.83	147.43	15.01	174.87	27.44	43.18

[a] *Includes load for Administrative Expense Contribution.*

(1) through (3). The number of retirees has increased from 1,144 in 2016 to 1,378 in 2023 and the number of actives has fluctuated but remained relatively stable. The trend shown in the table suggests that the System is maturing.

(5). In 2020, 2021, 2022, and 2023, contributions were less than benefits and expenses, which means investment income was used to pay a portion of benefits. For underfunded plans, it is preferable for contributions to exceed benefits and expenses; otherwise, assets may not grow at an adequate rate.

(9). The actuarially determined contribution (ADC) has increased from $121 million in 2016 to $175 million in 2023, an increase of 44 percent over the period. The ADC increased in 2018 due to a change in the amortization policy. The ADC has also increased because the statutory policy produced contributions that are less than the ADC.

(10). ADC less Actual State Contributions. Represents additional employer contribution needed to finance normal cost and existing unfunded actuarial liability over a 25-year closed period as of July 1, 2015, expressed as a level percentage of capped payroll.

(11). The total normal cost has decreased from $56 million in 2016 to $43 million in 2023. The decrease is mainly due to the growing proportion of active members with Tier 2 benefits.

Table 15 (Concluded)
Key Historical Valuation Results

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	Actuarial									Impact of	
	Value of	Actuarial Accrued Liability (AAL)				Funded Ratio	Demographic	Investment	Impact of Plan	Assumption	Contribution
Valuation Year	Assets (AVA)	Active	Inactive	Retiree	Total	(AVA/AAL)	(Gain)/Loss	(Gain)/Loss	Changes	Changes	(Excess)/Shortfall
2016	$ 870.89	$ 756.90	$ 12.20	$ 1,777.35	$ 2,546.45	34.20%	$ (3.48)	$ 2.88	$ -	$ 153.18	$ 13.02
2017	942.99	741.17	9.27	1,898.82	2,649.26	35.59%	19.36	(9.47)	-	-	20.82
2018	1,012.76	735.04	8.53	1,978.29	2,721.85	37.21%	1.72	(5.36)	-	(9.64)	16.11
2019	1,068.74	703.69	13.39	2,075.94	2,793.02	38.26%	35.31	8.10	-	(37.74)	9.50
2020	1,121.25	701.24	6.72	2,141.91	2,849.87	39.34%	(4.33)	8.34	-	-	0.32
2021	1,227.41	676.12	12.17	2,232.31	2,920.60	42.03%	14.98	(44.92)	-	-	(5.49)
2022	1,309.80	668.48	9.78	2,277.36	2,955.63	44.32%	16.97	(14.77)	-	(32.73)	(16.84)
2023	1,357.08	611.86	6.67	2,422.89	3,041.42	44.62%	46.20	5.14	-	-	(12.83)

Historical Actuarial Valuation Information and Results ($ in Millions)

(13) and (15). The actuarial liability for active members has decreased, whereas the actuarial liability for retired members has increased. This is due to the relative level of Tier 1 and Tier 2 benefits. The actuarial liability for retired members is comprised primarily of Tier 1 benefits, whereas the actuarial liability for active members is comprised of both Tier 1 and Tier 2 benefits. The level of Tier 2 benefits for active members increases as newly retired Tier 1 members are effectively replaced with newly hired Tier 2 members.

(17). The funded ratio, using the actuarial value of assets, has grown marginally from 34.20 percent at 2016 to 44.62 percent at 2023. One of the key reasons for the slow growth in the funded ratio is the statutory funding policy.

(21). An Experience Study was performed in 2022 and assumptions were modified to be more consistent with observed experience. The decrease in liabilities was due to the impact of updated demographic assumptions.

(22). Contribution shortfall reflects the additional contributions needed to *maintain* the current level of unfunded actuarial liability. Note that this measure does not address the additional contributions needed to *reduce* the unfunded actuarial liability.

SECTION J

STRESS TESTING SCENARIOS

December 19, 2023

Board of Trustees
Judges' Retirement System of Illinois
2101 South Veterans Parkway
P.O. Box 19255
Springfield, Illinois 62694-9255

Re: Stress Testing Scenarios Based on Actuarial Valuation Results as of June 30, 2023

Dear Members of the Board:

At your request, we have performed stress testing of the required statutory contributions and funded ratio for the Judges' Retirement System of Illinois ("JRS") based on the results of the June 30, 2023, actuarial valuation. This stress testing was performed to illustrate the projected impact on actuarial valuation results (including the annual contribution requirement and funded ratio) due to the risks that may reasonably be anticipated to significantly affect the System (e.g., significant market downturn or significant volatility in investment returns, or volatility in future System participation).

GRS has prepared this analysis exclusively for the Trustees of the Judges' 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 JRS only in its entirety and only with the permission of the Board.

The assessment of the financial impact on the System first requires the identification of the key risks that impact the System. Actuarial Standard of Practice (ASOP) 51 Section 3.2 states, "The actuary should identify risks that, in the actuary's professional judgment, may reasonably be anticipated to significantly affect the plan's future financial condition."

The areas of risk that may reasonably be anticipated to significantly affect the future financial condition of JRS include:

- Investment risk;
- Assumption change risk, including change in interest rate assumption;
- Contribution risk; and
- Demographic risks.

The stress test scenarios in this analysis were designed to assess the impact of the risks listed above. There may be other risks not included in the above list that could significantly affect the System.

Historical Analysis

One method of identifying significant risks to JRS is to analyze historical data related to changes in the Unfunded Actuarial Accrued Liability (UAAL) over time by source. The following table shows changes in the UAAL by source over the past several years, in terms of dollars and percent of the beginning of year AAL.

Historical Actuarial Valuation Information and Results ($ in Millions)								
	Demographic (Gain)/Loss		Investment (Gain)/Loss		Impact of Plan Changes		Impact of Assumption Changes	
Valuation Year	$	% of BOY AAL	$	% of BOY AAL	$	% of BOY AAL	$	% of BOY AAL
2016	$ (3.48)	-0.2%	$ 2.88	0.1%	$ -	0.0%	$ 153.18	6.6%
2017	19.36	0.8%	(9.47)	-0.4%	-	0.0%	-	0.0%
2018	1.72	0.1%	(5.36)	-0.2%	-	0.0%	(9.64)	-0.4%
2019	35.31	1.3%	8.10	0.3%	-	0.0%	(37.74)	-1.4%
2020	(4.33)	-0.2%	8.34	0.3%	-	0.0%	-	0.0%
2021	14.98	0.5%	(44.92)	-1.6%	-	0.0%	-	0.0%
2022	16.97	0.6%	(14.77)	-0.5%	-	0.0%	(32.73)	-1.1%
2023	46.20	1.6%	5.14	0.2%	-	0.0%	-	0.0%
Total	$ 126.74		$ (50.05)		$ -		$ 73.07	

As shown in the above table, demographic gains and losses have been the most significant experience factor contributing to the increase in the UAAL of JRS. Changes in assumptions are the next significant with investment gains and losses being the third most according to this analysis. However, because the funded ratio is currently less than 45%, JRS has been historically less impacted by investment risk than it will be when the assets and funded ratio are projected to be higher (closer to 2045). In addition, the use of asset smoothing helps dampen the annual volatility due to this risk.

Baseline Projections

Under the projected results from the actuarial valuation as of June 30, 2023, in which all future actuarial assumptions are assumed to be realized, the statutory dollar contribution remains fairly level through 2027 and increases from 2028 to 2032. Annual increases become larger in 2033, once the statutory contributions are no longer limited by the maximum contribution.

A Baseline projection of cash flows, accrued liabilities, and market value of assets can be found in Exhibit C-9. The market value of assets is projected to increase, at a decreasing rate from 2023 to 2033, primarily due to the GOB contribution limit. After 2033, the market value of assets increases for the most part, at an increasing rate, since contributions are not impacted by the GOB contribution limit. Most of the growth in assets occurs from 2038 through 2045. The declining growth in the market value of assets through 2033, due to the GOB contribution limit, is the primary reason for the slow growth in the funded ratio through 2033. After 2038, the funded ratio grows significantly from 59 percent in 2038 to 90 percent in 2045.

Investment Risk

Investment risk is the potential that investment returns will be different than expected. In general, the chief concern is that investment returns will be lower than expected, leading to increases in the Unfunded Actuarial Accrued Liability (UAAL) which lead to additional contributions to make up the investment return shortfall.

Stress Testing Scenarios for Investment Risk

Exhibit B-1 contains the rates of return used for the investment return stress tests. Scenarios 1 through 5 contain the results of stress testing the investment risk. The investment return stress test analysis projects the actuarial valuation results assuming that the plan assets earn 6.50 percent, the 25th percentile return of 4.37 percent, and the 40th percentile return of 5.95 percent. In order to demonstrate the risk and volatility of the returns, we are providing results assuming both static returns of 6.50 percent, 4.37 percent, or 5.95 percent and volatile returns that produce 22-year geometric average returns of approximately 6.50 percent, 4.37 percent or 5.95 percent. In Scenarios 1 through 5, the discount rate used to determine liabilities remains at 6.50 percent, average future wage inflation remains at 2.50 percent per year, and the future active population remains constant at 953 members.

Please note that each volatile 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 assumption review issued to the System on June 26, 2023.

GRS believes that these scenarios provide a reasonable illustration of potential future volatility of investment returns and the resulting actuarial valuation results. Annual returns will likely be significantly different from the returns shown in Exhibit B-1 and the 22-year geometric average of actual returns may be either higher or lower than the assumption of 6.50 percent.

Exhibits C-1 through C-4 contain the numerical results of the stress testing of the investment return. Exhibit A-1 shows a graphical representation as well. The following summarizes the results of the investment return stress testing results.

Scenario 1 – Volatile 6.50 Percent

In Scenario 1, which is based on the assumption that the 22-year geometric average of the returns is equal to 6.50 percent but with volatility in the year to year rate of return, the annual contribution requirement is not as stable as the baseline scenario. Relative to the baseline, the contribution requirement is lower from 2026 to 2033 and then higher until 2045.

Scenario 2 – Static 4.37 Percent

In Scenario 2, which is based on the assumption that the annual rate of return is equal to 4.37 percent, the annual contribution requirement increases each year at an increasing rate. Relative to the baseline, the contribution requirement is higher in all years after 2025.

Scenario 3 – Volatile 4.37 Percent

Scenario 3 is based on the assumption that the 22-year geometric average of the returns is equal to 4.37 percent but with volatility in the year to year rate of return.

Under this scenario, the annual contribution requirement relative to the baseline is higher in all years from 2028 through 2045. The 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 5.95 Percent

In Scenario 4, which is based on the assumption that the annual rate of return is equal to 5.95 percent, the annual contribution requirement periodically increases each year at an increasing rate. Relative to the baseline, the contribution requirement is higher in all years after 2025. Relative to Scenario 2, the rate of increase is lower because more investment income is used to fund benefits.

Scenario 5 – Volatile 5.95 Percent

Scenario 5 is based on the assumption that the 22-year geometric average of the returns is equal to 5.95 percent but with volatility in the year to year rate of return. Under this scenario the annual contribution requirement relative to the baseline is higher for all years from 2028 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 significantly different.

Assumption Change Risk

Assumption change risk is the potential that assumptions will need to change from what they are currently to reflect the circumstances surrounding future actuarial valuations. One example of this risk is that a significant shift in capital market expectations could require a reduction in the investment return assumption.

Stress Testing Scenarios for Assumption Change Risk

In Scenario 6, the discount rate used to determine liabilities was reduced to 6.00 percent.

Exhibits C-1 through C-4 contain the numerical results of reducing the assumed rate of investment return. Exhibit A-1 shows a graphical representation as well.

In addition to the reduction in the investment return assumption scenario, we have provided scenarios that stress test the required statutory contributions and funded ratio based on fluctuations in the salary increase assumption. While this would be considered an assumption change and therefore related to assumption change risk, we have included it in the demographic risk section.

Scenario 6 – Static 6.00 percent with liabilities based on 6.00 percent

In Scenario 6, which is based on the assumption that the annual rate of return is equal to 6.00 percent and liabilities are based on a discount rate of 6.00 percent, the annual contribution requirement remains fairly level through 2027 and increases from 2028 to 2032. Annual increases become larger in 2033, once the statutory contributions are no longer limited by the maximum contribution. As expected, relative to the baseline, the contribution requirement is higher in all years after 2025. When compared to the baseline, contributions increase by approximately 6.0 percent.

Contribution Risk

Contribution risk is the potential that actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll or other relevant factors that determines the amount of contributions the System will receive.

Due to the current funded status and statutory contribution policy, JRS is subject to higher contribution risk than many plans. Under the statutory contribution policy, contributions are calculated as a level percentage of payroll such that the funded ratio is projected to be 90% in 2045. This policy produces backloaded contributions.

There is also contribution risk for JRS associated with the assumptions related to projecting the actuarial accrued liability, benefits and payroll to 2045 (as required under the statutory funding policy). To the extent that certain assumptions differ from actual experience, significant changes in contributions could occur. The analysis of risks related to changes in the actuarial assumptions are dealt with in the Assumption Change Risk and Demographic Risk sections.

Stress Testing Scenarios for Contribution Risk

Scenario 7 compares the required statutory contributions and funded ratio to those based on a funding target of 100 percent by 2045, under baseline assumptions, rather than the current target of 90 percent by 2045 required in the Statute.

Exhibits C-1 through C-4 contain the numerical results of utilizing a funding target of 100 percent. Exhibit A-1 shows a graphical representation as well.

Scenario 7 – 100 Percent Funded Ratio in 2045

In Scenario 7, which is based on achieving a funded ratio of 100 percent in 2045, the statutory dollar contribution is stable in 2026 and 2027 and then increases again beginning in 2028. The increases are relatively small until 2034 and then increase substantially, once the statutory contributions are no longer limited by the maximum contribution. Increasing the baseline projected contributions by approximately 3 percent increases the projected funded ratio at 2045 from 90 percent to 100 percent.

Demographic Risk

Demographic risk is the potential for demographic experience, or experience related to the activity of the covered members, to differ from what the actuarial valuation assumes. For example, members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and 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.

As mentioned earlier, there is a good deal of risk for JRS associated with the assumptions related to projecting the actuarial accrued liability, benefits and payroll to 2045 (as required under the statutory funding policy). One of the assumptions that impacts these projections is the salary increase and wage inflation assumptions.

There are other areas of demographic risk (including mortality, retirement, termination and disability) differing from the assumptions used in the actuarial valuation. While the table on page 2 indicates that demographic gains and losses have been a significant source of unfunded liability in the past, one of the key drivers is usually salary increases relative to the assumption.

Stress Testing Scenarios for Demographic Risk

In order to demonstrate the risk and volatility associated with changes to salary increases, we are providing results under the following scenarios: Scenario 8 – wage inflation assumption increases by 1.0 percentage point from the assumed rate of 2.5 percent per year to 3.5 percent per year; and Scenario 9 – wage inflation assumption decreases by 1.0 percentage point from the assumed rate of 2.5 percent per year to 1.5 percent per year. In Scenarios 8 and 9, the investment return assumption and discount rate used to determine the liabilities remain at 6.50 percent.

Exhibits C-5 through C-8 contain the numerical results of the wage inflation assumption stress testing. Exhibit A-2 shows a graphical representation as well.

Scenario 8 – Increased Salary Growth

Scenario 8 is based on the assumption that wage inflation for active members will increase from the baseline assumption of 2.5 percent per year to 3.5 percent per year. Under this scenario the statutory contribution increases during the entire period. There are larger annual increases beginning in 2034 once the statutory dollar contributions are no longer limited by the maximum contribution. Relative to the baseline, the contribution requirement is higher in all years from 2025 through 2045.

Scenario 9 – Decreased Salary Growth

Scenario 9 is based on the assumption that wage inflation for active members will decrease from the baseline assumption of 2.5 percent per year to 1.5 percent per year. Under this scenario, the statutory contribution periodically increases and decreases until 2030, then increases again. Increases become larger beginning in 2034 once the statutory contributions are no longer limited by the maximum contribution. Relative to the baseline, the contribution requirement is lower in all years from 2025 through 2045.

Other Observations

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 Scenarios 1 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 actuarial valuation assumption of 6.50 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 actuarial 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, 2023, 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 contribution 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.

Other Risks and Factors Considered

An additional risk area that was not analyzed using stress testing was asset/liability mismatch risk. This is the risk that potential changes in the assets are not matched by changes in the liabilities. This risk is closely related to many of the risks that were previously discussed. For example, asset/liability mismatch occurs in JRS because the discount return is linked to the expected return on assets. If the investment return assumption decreases, there is an immediate increase in the liabilities and a decrease in future expected returns on the assets. Therefore, asset/liability mismatch risk is also related to assumption change risk. Asset/liability mismatch risk can also be related to demographic risk since future changes in demographics will influence the liabilities to a greater extent than the assets. Asset/liability mismatch risk is common in public sector plans for the reasons stated above. Relatively well funded plans that utilize Liability Driven Investing or other significant hedging strategies are generally less exposed to asset/liability mismatch risk.

In performing the risk assessments in this report, we considered a number of factors, including: the funded status of JRS, the asset allocation, and the statutory funding policy. The low funded ratio (45% in 2023) coupled with the statutory funding policy means that there is significant contribution risk near the end of the funding period. The asset allocation was considered when determining the investment return scenarios. To a lesser extent, we considered the size of JRS relative to the plan sponsor (the State) but it did not necessarily factor into our analyses.

Additional Disclosures

To the best of our knowledge, this actuarial statement is complete and accurate, fairly presents the actuarial position of JRS as of June 30, 2023, 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, 2023, and is subject to the same actuarial assumptions and disclosures as used in the presentation and the annual actuarial valuation report. The investment return stress testing scenarios used future investment returns as shown in Exhibit B-1 and the salary growth stress testing scenarios used wage inflation assumptions as shown in Exhibit B-2. All other assumptions and methods were the same as those used in 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 agrees 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.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

The signing actuaries are independent of the plan sponsor.

Alex Rivera, Heidi G. Barry, and Jeffrey T. Tebeau are Members of the American Academy of Actuaries ("MAAA") and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,
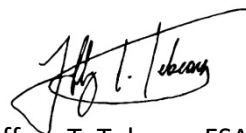
Gabriel, Roeder, Smith & Company

Alex Rivera, FSA, EA, MAAA, FCA
Senior Consultant

Heidi G. Barry, ASA, MAAA, FCA
Senior Consultant

Jeffrey T. Tebeau, FSA, EA, MAAA, FCA
Senior Consultant

Judges' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Statutory Contribution Dollars and Funded Ratios
Based on Actuarial Valuation as of June 30, 2023

Projection of State Contributions
Dollars (in millions)

- - - Baseline (6.50% annual returns) —— Scenario 2 (4.37% annual returns) —— Scenario 4 (5.95% annual returns)
—— Scenario 6 (6.00% annual returns) —— Scenario 7 (100% Target Funded Ratio)
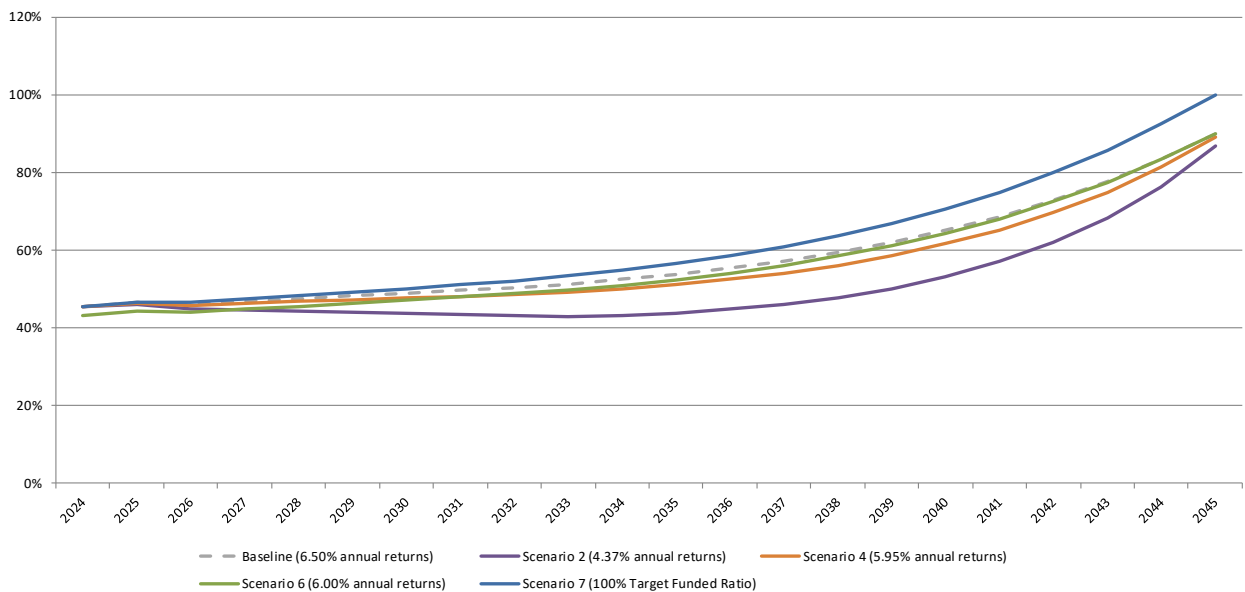
Projection of Funded Ratio

- - - Baseline (6.50% annual returns) —— Scenario 2 (4.37% annual returns) —— Scenario 4 (5.95% annual returns)
—— Scenario 6 (6.00% annual returns) —— Scenario 7 (100% Target Funded Ratio)

Judges' Retirement System of Illinois
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Statutory Contribution Dollars and Funded Ratios
Based on Actuarial Valuation as of June 30, 2023

Projection of State Contributions
Dollars (in millions)

Legend: Baseline (2.50% Wage Inflation) — Scenario 8 (3.50% Wage Inflation) — Scenario 9 (1.50% Wage Inflation)

Projection of Funded Ratio

Legend: Baseline (2.50% Wage Inflation) — Scenario 8 (3.50% Wage Inflation) — Scenario 9 (1.50% Wage Inflation)

Judges' 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, 2023

	Illinois JRS						
Scenario	**Baseline; 7**	**1**	**2**	**3**	**4**	**5**	**6**
Investment Return Assumption	6.50% per year	Varying Rates for the first 22 years, 6.50% per year thereafter	4.37% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	5.95% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	6.00% per year
22-Year Geometric Return	6.50%	6.50%	4.37%	4.37%	5.95%	5.95%	6.00%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 22 years with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with volatility, based on the System's asset allocation policy	N/A
Fiscal Year	**Rates of Investment Returns**						
2024	6.50%	8.56%	4.37%	8.27%	5.95%	6.91%	6.00%
2025	6.50%	6.63%	4.37%	3.72%	5.95%	7.44%	6.00%
2026	6.50%	4.84%	4.37%	2.63%	5.95%	3.38%	6.00%
2027	6.50%	16.57%	4.37%	-4.02%	5.95%	6.30%	6.00%
2028	6.50%	-1.72%	4.37%	6.36%	5.95%	7.81%	6.00%
2029	6.50%	5.74%	4.37%	8.24%	5.95%	3.22%	6.00%
2030	6.50%	10.36%	4.37%	2.35%	5.95%	10.33%	6.00%
2031	6.50%	-5.85%	4.37%	-2.70%	5.95%	9.88%	6.00%
2032	6.50%	3.56%	4.37%	9.02%	5.95%	-5.01%	6.00%
2033	6.50%	10.47%	4.37%	10.64%	5.95%	12.32%	6.00%
2034	6.50%	14.23%	4.37%	-5.43%	5.95%	7.09%	6.00%
2035	6.50%	4.47%	4.37%	1.60%	5.95%	3.15%	6.00%
2036	6.50%	6.09%	4.37%	10.78%	5.95%	13.63%	6.00%
2037	6.50%	7.12%	4.37%	5.10%	5.95%	3.76%	6.00%
2038	6.50%	4.90%	4.37%	11.00%	5.95%	-1.25%	6.00%
2039	6.50%	3.77%	4.37%	4.43%	5.95%	8.86%	6.00%
2040	6.50%	-4.69%	4.37%	-3.37%	5.95%	3.13%	6.00%
2041	6.50%	15.28%	4.37%	6.51%	5.95%	5.21%	6.00%
2042	6.50%	4.58%	4.37%	2.09%	5.95%	7.70%	6.00%
2043	6.50%	16.74%	4.37%	15.22%	5.95%	13.05%	6.00%
2044	6.50%	10.47%	4.37%	0.54%	5.95%	5.45%	6.00%
2045	6.50%	4.59%	4.37%	6.19%	5.95%	0.70%	6.00%

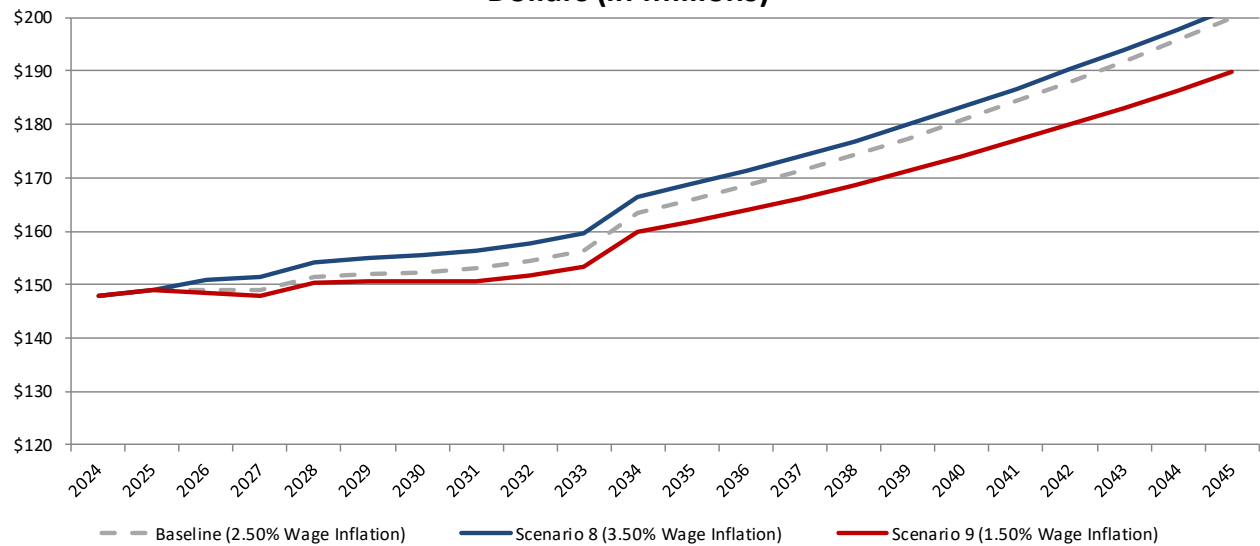**Judges' Retirement System of Illinois**
Comparison of Actuarial Valuation Results and Stress Testing Scenarios
Projection of Capped Payroll
Based on Actuarial Valuation as of June 30, 2023

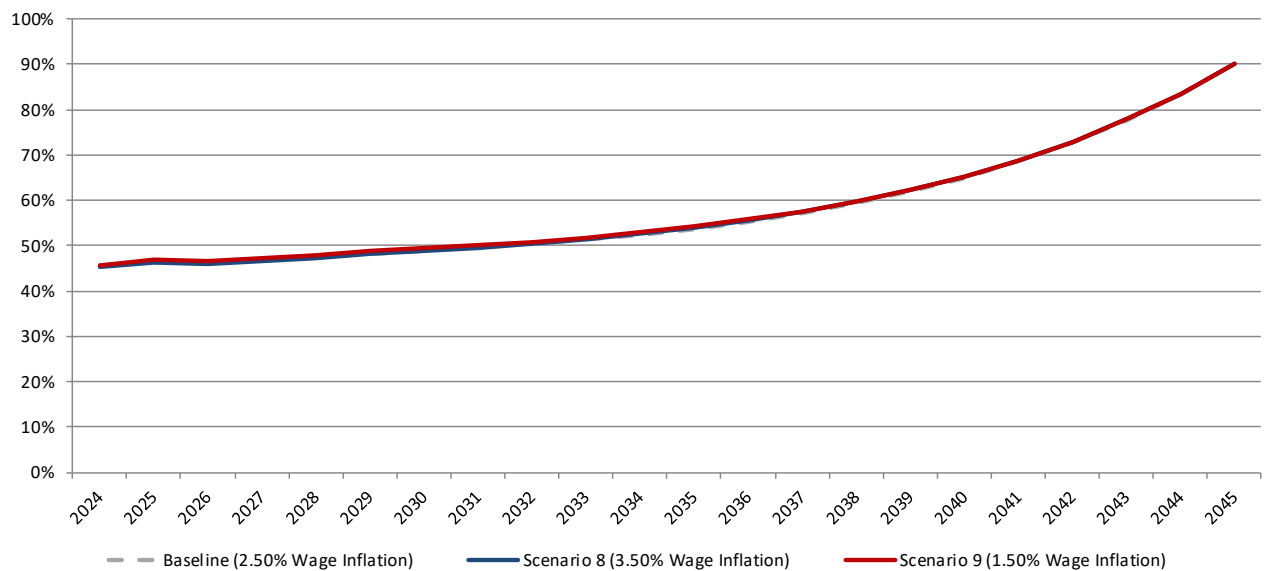| Illinois JRS			
Scenario	**Baseline; 1-7**	**8**	**9**
Investment Return Assumption	6.50% per year	6.50% per year	6.50% per year
Wage Inflation Assumption	2.50%	3.50%	1.50%
Population Growth Assumption	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period
Fiscal Year	**Capped Payroll ($ in millions)**		
2024	$154.64	$154.64	$154.64
2025	155.30	155.90	154.70
2026	155.81	156.90	154.67
2027	156.66	158.13	155.03
2028	157.47	159.22	155.41
2029	158.81	160.78	156.31
2030	160.19	162.28	157.27
2031	161.76	163.90	158.43
2032	163.55	165.70	159.80
2033	165.37	167.43	161.21
2034	167.68	169.67	163.06
2035	170.13	172.02	165.04
2036	172.86	174.65	167.25
2037	175.70	177.35	169.56
2038	178.77	180.28	172.06
2039	182.02	183.38	174.70
2040	185.49	186.72	177.52
2041	189.10	190.21	180.47
2042	192.91	193.91	183.58
2043	196.79	197.64	186.77
2044	200.87	201.62	190.14
2045	205.07	205.70	193.63

Exhibit C-1

Judges' 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, 2023

	Illinois JRS							
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Investment Return Assumption	6.50% per year	Varying Rates for the first 22 years, 6.50% per year thereafter	4.37% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	5.95% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	6.00% per year	6.50% per year
22-Year Geometric Return	6.50%	6.50%	4.37%	4.37%	5.95%	5.95%	6.00%	6.50%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 22 years with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with volatility, based on the System's asset allocation policy	N/A	N/A
Target Funded Ratio	90%	90%	90%	90%	90%	90%	90%	100%
Fiscal Year	Contribution Dollar Amount ($ in millions)							
2024	$147.84	$147.84	$147.84	$147.84	$147.84	$147.84	$147.84	$147.84
2025	148.89	148.89	148.89	148.89	148.89	148.89	148.89	148.89
2026	148.93	148.42	149.44	148.49	149.06	148.82	158.81	153.83
2027	148.85	147.68	150.61	148.59	149.30	148.39	158.76	153.78
2028	151.35	150.85	154.67	152.81	152.63	151.87	159.83	156.30
2029	152.04	149.30	157.41	157.08	153.89	153.17	160.59	157.03
2030	152.35	148.76	160.31	161.64	154.90	153.77	160.98	157.39
2031	152.97	149.85	163.67	166.51	156.26	155.46	161.68	158.06
2032	154.42	150.84	168.01	172.38	158.52	157.51	163.23	159.57
2033	156.46	155.26	173.12	180.29	161.41	158.09	165.36	161.66
2034	163.44	168.45	187.12	195.87	169.54	166.29	173.64	168.73
2035	165.84	175.17	193.59	200.87	173.10	170.50	176.18	171.20
2036	168.50	178.79	200.66	210.20	177.05	172.92	179.01	173.95
2037	171.27	184.08	208.18	221.22	181.23	178.32	181.95	176.81
2038	174.26	184.17	216.43	228.54	185.79	182.92	185.13	179.90
2039	177.42	182.53	225.49	237.39	190.73	181.93	188.49	183.16
2040	180.80	183.63	235.67	246.97	196.16	189.32	192.08	186.65
2041	184.33	192.03	247.16	251.06	202.13	197.97	195.82	190.29
2042	188.04	210.57	260.74	260.28	208.86	207.18	199.77	194.12
2043	191.82	227.08	277.51	277.25	216.62	228.31	203.78	198.02
2044	195.80	249.03	300.70	304.41	226.43	250.39	208.01	202.13
2045	199.89	245.68	342.67	338.29	242.03	236.32	212.36	206.36
Total Cont. through 2045	**$3,675.51**	**$3,878.90**	**$4,469.89**	**$4,556.87**	**$3,902.37**	**$3,886.18**	**$3,882.19**	**$3,785.67**
Present Value of Total Cont.	**$1,916.78**	**$1,976.55**	**$2,198.89**	**$2,236.25**	**$1,997.26**	**$1,985.26**	**$2,016.52**	**$1,970.35**

Exhibit C-2

Judges' 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, 2023

					Illinois JRS			
Scenario	Baseline	1	2	3	4	5	6	7
Investment Return Assumption	6.50% per year	Varying Rates for the first 22 years, 6.50% per year thereafter	4.37% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	5.95% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	6.00% per year	6.50% per year
22-Year Geometric Return	6.50%	6.50%	4.37%	4.37%	5.95%	5.95%	6.00%	6.50%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 22 years with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with volatility, based on the System's asset allocation policy	N/A	N/A
Target Funded Ratio	90%	90%	90%	90%	90%	90%	90%	100%
Fiscal Year				Contribution as a Percent of Payroll				
2024	95.60%	95.60%	95.60%	95.60%	95.60%	95.60%	95.60%	95.60%
2025	95.87%	95.87%	95.87%	95.87%	95.87%	95.87%	95.87%	95.87%
2026	95.58%	95.26%	95.91%	95.30%	95.67%	95.52%	101.93%	98.73%
2027	95.02%	94.27%	96.14%	94.85%	95.30%	94.72%	101.34%	98.16%
2028	96.11%	95.80%	98.22%	97.04%	96.92%	96.44%	101.49%	99.26%
2029	95.73%	94.01%	99.12%	98.91%	96.90%	96.45%	101.12%	98.88%
2030	95.11%	92.87%	100.08%	100.91%	96.70%	95.99%	100.49%	98.25%
2031	94.57%	92.64%	101.18%	102.94%	96.60%	96.11%	99.95%	97.72%
2032	94.42%	92.23%	102.73%	105.40%	96.92%	96.31%	99.80%	97.57%
2033	94.61%	93.88%	104.69%	109.03%	97.61%	95.60%	100.00%	97.76%
2034	97.48%	100.46%	111.60%	116.81%	101.11%	99.17%	103.55%	100.63%
2035	97.48%	102.96%	113.79%	118.07%	101.74%	100.22%	103.55%	100.63%
2036	97.48%	103.43%	116.08%	121.60%	102.42%	100.03%	103.55%	100.63%
2037	97.48%	104.77%	118.48%	125.91%	103.14%	101.49%	103.55%	100.63%
2038	97.48%	103.02%	121.07%	127.84%	103.93%	102.32%	103.55%	100.63%
2039	97.48%	100.28%	123.88%	130.42%	104.79%	99.95%	103.55%	100.63%
2040	97.48%	99.00%	127.05%	133.14%	105.75%	102.07%	103.55%	100.63%
2041	97.48%	101.55%	130.70%	132.76%	106.89%	104.69%	103.55%	100.63%
2042	97.48%	109.15%	135.16%	134.92%	108.26%	107.39%	103.55%	100.63%
2043	97.48%	115.40%	141.02%	140.89%	110.08%	116.02%	103.55%	100.63%
2044	97.48%	123.98%	149.70%	151.54%	112.72%	124.65%	103.55%	100.63%
2045	97.48%	119.80%	167.10%	164.96%	118.03%	115.24%	103.55%	100.63%

Exhibit C-3

Judges' 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, 2023

	Illinois JRS							
Scenario	**Baseline**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Investment Return Assumption	6.50% per year	Varying Rates for the first 22 years, 6.50% per year thereafter	4.37% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	5.95% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	6.00% per year	6.50% per year
22-Year Geometric Return	6.50%	6.50%	4.37%	4.37%	5.95%	5.95%	6.00%	6.50%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 22 years with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with volatility, based on the System's asset allocation policy	N/A	N/A
Target Funded Ratio	90%	90%	90%	90%	90%	90%	90%	100%
Fiscal Year	Funded Ratio							
2024	45.49%	45.67%	45.31%	45.64%	45.45%	45.53%	43.12%	45.49%
2025	46.48%	46.90%	45.88%	46.58%	46.33%	46.64%	44.20%	46.65%
2026	46.10%	46.59%	44.86%	45.72%	45.77%	46.13%	43.97%	46.43%
2027	46.79%	48.22%	44.71%	44.94%	46.25%	46.58%	44.77%	47.32%
2028	47.53%	49.37%	44.40%	43.93%	46.72%	47.21%	45.57%	48.25%
2029	48.25%	49.93%	44.07%	42.96%	47.17%	47.54%	46.35%	49.19%
2030	48.95%	50.79%	43.73%	42.03%	47.60%	48.02%	47.12%	50.12%
2031	49.65%	50.70%	43.39%	40.71%	48.03%	49.26%	47.90%	51.09%
2032	50.41%	49.02%	43.12%	40.39%	48.51%	49.54%	48.73%	52.13%
2033	51.26%	48.57%	42.97%	40.71%	49.09%	49.91%	49.67%	53.30%
2034	52.42%	49.48%	43.27%	40.59%	49.99%	51.13%	50.94%	54.80%
2035	53.76%	50.34%	43.84%	40.40%	51.09%	51.92%	52.41%	56.53%
2036	55.33%	52.69%	44.72%	41.60%	52.44%	53.17%	54.11%	58.54%
2037	57.18%	55.80%	45.99%	43.17%	54.09%	55.97%	56.10%	60.87%
2038	59.37%	58.67%	47.74%	45.28%	56.12%	57.66%	58.43%	63.59%
2039	61.95%	60.63%	50.07%	49.05%	58.59%	59.50%	61.16%	66.77%
2040	65.00%	61.75%	53.11%	53.02%	61.60%	61.98%	64.36%	70.49%
2041	68.59%	64.10%	57.00%	57.04%	65.25%	64.10%	68.10%	74.81%
2042	72.81%	67.61%	61.94%	61.68%	69.64%	67.46%	72.46%	79.84%
2043	77.73%	73.88%	68.18%	68.19%	74.92%	74.17%	77.51%	85.66%
2044	83.43%	83.33%	76.14%	76.45%	81.28%	82.47%	83.33%	92.35%
2045	90.00%	95.00%	86.83%	88.10%	89.07%	90.48%	90.00%	100.00%

Exhibit C-4

Judges' 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, 2023

				Illinois JRS				
Scenario	Baseline	1	2	3	4	5	6	7
Investment Return Assumption	6.50% per year	Varying Rates for the first 22 years, 6.50% per year thereafter	4.37% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	5.95% per year for the first 22 years, 6.50% per year thereafter	Varying Rates for the first 22 years, 6.50% per year thereafter	6.00% per year	6.50% per year
22-Year Geometric Return	6.50%	6.50%	4.37%	4.37%	5.95%	5.95%	6.00%	6.50%
Summary of Investment Returns Included in the Scenario	N/A	Investment returns during the first 22 years with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 25th percentile return with volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with no volatility, based on the System's asset allocation policy	Investment returns during the first 22 years represent the 40th percentile return with volatility, based on the System's asset allocation policy	N/A	N/A
Target Funded Ratio	90%	90%	90%	90%	90%	90%	90%	100%
Fiscal Year	Unfunded Accrued Liability ($ in millions)							
2024	$1,672.69	$1,667.32	$1,678.24	$1,668.08	$1,674.12	$1,671.62	$1,833.15	$1,672.69
2025	1,653.12	1,640.28	1,671.61	1,649.97	1,657.92	1,648.11	1,808.49	1,648.08
2026	1,671.75	1,656.38	1,710.18	1,683.37	1,681.78	1,670.73	1,821.66	1,661.32
2027	1,652.18	1,608.08	1,716.87	1,709.86	1,669.16	1,658.81	1,796.26	1,635.99
2028	1,627.44	1,570.51	1,724.38	1,739.10	1,652.60	1,637.36	1,766.86	1,605.07
2029	1,599.20	1,547.14	1,728.29	1,762.47	1,632.60	1,621.12	1,733.69	1,570.23
2030	1,567.87	1,511.36	1,728.34	1,780.33	1,609.41	1,596.36	1,697.17	1,531.81
2031	1,533.37	1,501.56	1,724.12	1,805.79	1,582.84	1,545.48	1,657.20	1,489.71
2032	1,494.21	1,536.04	1,713.86	1,795.97	1,551.42	1,520.29	1,612.37	1,442.41
2033	1,449.87	1,530.02	1,696.69	1,763.85	1,514.40	1,490.25	1,562.11	1,389.33
2034	1,394.88	1,481.11	1,662.95	1,741.62	1,466.05	1,432.56	1,499.81	1,324.95
2035	1,333.49	1,432.02	1,619.60	1,718.82	1,410.54	1,386.50	1,430.81	1,253.48
2036	1,265.14	1,339.80	1,565.60	1,654.12	1,347.13	1,326.31	1,354.58	1,174.30
2037	1,189.27	1,227.56	1,499.96	1,578.41	1,275.13	1,222.98	1,270.61	1,086.82
2038	1,105.31	1,124.24	1,421.45	1,488.56	1,193.71	1,151.61	1,178.27	990.38
2039	1,012.61	1,047.64	1,328.68	1,355.88	1,101.99	1,077.89	1,077.01	884.29
2040	910.49	994.94	1,219.88	1,222.06	998.92	989.13	966.11	767.79
2041	798.30	912.49	1,093.04	1,091.94	883.38	912.42	845.01	640.18
2042	675.15	804.22	945.10	951.48	753.79	807.89	712.78	500.47
2043	540.33	633.52	771.90	771.59	608.31	626.48	568.83	347.90
2044	392.87	395.16	565.62	558.22	443.87	415.63	412.18	181.40
2045	231.84	116.03	305.36	275.85	253.37	220.77	241.97	0.00

Exhibit C-5

Judges' 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, 2023

	Illinois JRS		
Scenario	Baseline	8	9
Investment Return Assumption	6.50% per year	6.50% per year	6.50% per year
Wage Inflation Assumption	2.50%	3.50%	1.50%
Population Growth Assumption	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period
Fiscal Year	Contribution Dollar Amount ($ in millions)		
2024	$147.84	$147.84	$147.84
2025	148.89	148.89	148.89
2026	148.93	151.01	148.56
2027	148.85	151.31	148.02
2028	151.35	154.13	150.43
2029	152.04	155.06	150.65
2030	152.35	155.53	150.53
2031	152.97	156.21	150.72
2032	154.42	157.68	151.72
2033	156.46	159.63	153.33
2034	163.44	166.47	159.83
2035	165.84	168.77	161.77
2036	168.50	171.35	163.93
2037	171.27	174.00	166.20
2038	174.26	176.87	168.65
2039	177.42	179.91	171.24
2040	180.80	183.19	174.01
2041	184.33	186.62	176.90
2042	188.04	190.25	179.94
2043	191.82	193.91	183.07
2044	195.80	197.81	186.37
2045	199.89	201.82	189.79
Total Cont. through 2045	$3,675.51	$3,728.26	$3,582.39
Present Value of Total Cont.	$1,916.78	$1,943.94	$1,880.39

Exhibit C-6

Judges' 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, 2023

Illinois JRS			
Scenario	**Baseline**	**8**	**9**
Investment Return Assumption	6.50% per year	6.50% per year	6.50% per year
Wage Inflation Assumption	2.50%	3.50%	1.50%
Population Growth Assumption	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period
Fiscal Year	**Contribution as a Percent of Payroll**		
2024	95.60%	95.60%	95.60%
2025	95.87%	95.87%	95.87%
2026	95.58%	96.25%	96.05%
2027	95.02%	95.69%	95.48%
2028	96.11%	96.81%	96.80%
2029	95.73%	96.45%	96.38%
2030	95.11%	95.84%	95.71%
2031	94.57%	95.31%	95.13%
2032	94.42%	95.16%	94.94%
2033	94.61%	95.34%	95.11%
2034	97.48%	98.11%	98.02%
2035	97.48%	98.11%	98.02%
2036	97.48%	98.11%	98.02%
2037	97.48%	98.11%	98.02%
2038	97.48%	98.11%	98.02%
2039	97.48%	98.11%	98.02%
2040	97.48%	98.11%	98.02%
2041	97.48%	98.11%	98.02%
2042	97.48%	98.11%	98.02%
2043	97.48%	98.11%	98.02%
2044	97.48%	98.11%	98.02%
2045	97.48%	98.11%	98.02%

Exhibit C-7

Judges' 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, 2023

	Illinois JRS		
Scenario	**Baseline**	**8**	**9**
Investment Return Assumption	6.50% per year	6.50% per year	6.50% per year
Wage Inflation Assumption	2.50%	3.50%	1.50%
Population Growth Assumption	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period
Fiscal Year	**Funded Ratio**		
2024	45.49%	45.17%	45.80%
2025	46.48%	46.17%	46.84%
2026	46.10%	45.82%	46.48%
2027	46.79%	46.55%	47.20%
2028	47.53%	47.33%	47.97%
2029	48.25%	48.10%	48.72%
2030	48.95%	48.85%	49.44%
2031	49.65%	49.61%	50.16%
2032	50.41%	50.42%	50.92%
2033	51.26%	51.33%	51.78%
2034	52.42%	52.53%	52.93%
2035	53.76%	53.91%	54.26%
2036	55.33%	55.51%	55.81%
2037	57.18%	57.39%	57.63%
2038	59.37%	59.59%	59.78%
2039	61.95%	62.17%	62.32%
2040	65.00%	65.22%	65.31%
2041	68.59%	68.80%	68.84%
2042	72.81%	72.98%	72.99%
2043	77.73%	77.85%	77.84%
2044	83.43%	83.50%	83.47%
2045	90.00%	90.00%	90.00%

Exhibit C-8

Judges' 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, 2023

	Illinois JRS		
Scenario	**Baseline**	**8**	**9**
Investment Return Assumption	6.50% per year	6.50% per year	6.50% per year
Wage Inflation Assumption	2.50%	3.50%	1.50%
Population Growth Assumption	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period	Active population remains constant at 953 members through the projection period
Fiscal Year	**Unfunded Accrued Liability ($ in millions)**		
2024	$1,672.69	$1,694.77	$1,652.28
2025	1,653.12	1,676.22	1,629.96
2026	1,671.75	1,695.47	1,646.08
2027	1,652.18	1,676.15	1,624.24
2028	1,627.44	1,651.31	1,597.05
2029	1,599.20	1,622.70	1,566.65
2030	1,567.87	1,590.72	1,533.40
2031	1,533.37	1,555.40	1,497.21
2032	1,494.21	1,515.28	1,456.72
2033	1,449.87	1,469.88	1,411.33
2034	1,394.88	1,413.84	1,355.71
2035	1,333.49	1,351.33	1,294.06
2036	1,265.14	1,281.79	1,225.86
2037	1,189.27	1,204.71	1,150.65
2038	1,105.31	1,119.49	1,067.82
2039	1,012.61	1,025.54	976.87
2040	910.49	922.12	877.13
2041	798.30	808.61	768.03
2042	675.15	684.08	648.77
2043	540.33	547.89	518.66
2044	392.87	399.02	376.83
2045	231.84	236.51	222.37

Exhibit C-9

Judges' Retirement System of Illinois
Baseline Valuation
Projection of Cashflows, Accrued Liability, and Market Value of Assets
Based on Actuarial Valuation as of June 30, 2023

	Baseline Valuation Projection ($ in Millions)							
Fiscal Year	Employer Contributions	Benefits and Administrative Expenses	Employer Normal Cost	Actuarial Accrued Liability (AAL)	Annual Change in AAL (%)	Market Value of Assets (MVA)	Annual Change in MVA (%)	Funded Ratio
2024	$147.84	$208.24	$28.91	$3,068.77		$1,364.47		44%
2025	148.89	215.49	27.20	3,088.93	0.66%	1,399.43	2.56%	45%
2026	148.93	222.87	25.75	3,101.45	0.41%	1,429.26	2.13%	46%
2027	148.85	230.38	24.14	3,105.30	0.12%	1,453.12	1.67%	47%
2028	151.35	236.85	23.30	3,101.66	-0.12%	1,474.22	1.45%	48%
2029	152.04	243.20	22.18	3,090.13	-0.37%	1,490.93	1.13%	48%
2030	152.35	248.94	21.26	3,071.26	-0.61%	1,503.39	0.84%	49%
2031	152.97	253.86	20.78	3,045.61	-0.84%	1,512.24	0.59%	50%
2032	154.42	258.63	19.91	3,013.02	-1.07%	1,518.81	0.43%	50%
2033	156.46	261.95	19.37	2,974.90	-1.27%	1,525.03	0.41%	51%
2034	163.44	264.65	18.85	2,931.51	-1.46%	1,536.63	0.76%	52%
2035	165.84	266.35	18.49	2,883.77	-1.63%	1,550.28	0.89%	54%
2036	168.50	267.33	18.27	2,832.21	-1.79%	1,567.07	1.08%	55%
2037	171.27	267.55	18.08	2,777.43	-1.93%	1,588.16	1.35%	57%
2038	174.26	266.98	17.98	2,720.15	-2.06%	1,614.84	1.68%	59%
2039	177.42	265.54	17.99	2,661.19	-2.17%	1,648.58	2.09%	62%
2040	180.80	263.25	18.07	2,601.38	-2.25%	1,690.89	2.57%	65%
2041	184.33	259.96	18.27	2,541.84	-2.29%	1,743.54	3.11%	69%
2042	188.04	256.21	18.41	2,482.99	-2.32%	1,807.84	3.69%	73%
2043	191.82	251.64	18.66	2,425.82	-2.30%	1,885.49	4.29%	78%
2044	195.80	246.65	18.89	2,370.86	-2.27%	1,977.99	4.91%	83%
2045	199.89	241.28	19.10	2,318.65	-2.20%	2,086.81	5.50%	90%